

Review

Effects of yoga exercises for headaches: a systematic review of randomized controlled trials

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Abstract. [Purpose] To assess the evidence for the effectiveness of yoga exercises in the management of headaches. [Subjects and Methods] A search was conducted of six electronic databases to identify randomized controlled trials (RCTs) reporting the effects of yogic intervention on headaches published in any language before January 2015. Quality assessment was conducted using the Cochrane risk of bias tool. [Results] One potential trial was identified and included in this review. The quality critical appraisal indicated a moderate risk of bias. The available data could only be included as a narrative description. Headache intensity and frequency, anxiety and depression scores, and symptomatic medication use were significantly lower in the yoga group compared to the control group. [Conclusion] There is evidence from one RCT that yoga exercises may be beneficial for headaches. However, the findings should be interpreted with caution due to the small number of RCTs. Therefore, further rigorous methodological and high quality RCTs are required to investigate the hypothesis that yoga exercises alleviate headaches, and to confirm and further comprehend the effects of standardized yoga programs on headaches.

Key words: Headaches, Yoga exercises

(This article was submitted Feb. 19, 2015, and was accepted Mar. 17, 2015)

INTRODUCTION

Headaches are a common and universal phenomenon in humans. They have been suggested as the main cause of time off from work, reduced school performance, and low quality of life¹⁻³). Furthermore, they have led to personal, familial and societal burdens, and significant healthcare problems globally^{4, 5}). The prevalence of headaches is estimated at 13% of the United States population⁶), 20% of the Australians¹), and migraines are estimated at 11%, with tension-type headaches at 78% of the population world-wide^{5, 7}).

According to the International Headache Society, headaches can generally be divided into two categories which are primary and secondary headaches on the basis of the underlying pathology⁸). Primary headaches are not associated with pre-existing medical conditions and there are three types: migraines, tension-headaches and cluster-headaches⁶). Secondary headaches are related to a pre-existing medical condition.

Headache management is traditionally based on pharmacological therapies. However, only about half of migraineurs show clinically positive responses to medications⁹). The remaining headache-sufferers discontinue medications due

to adverse side-effects or excessive use of abortive medications. These can lead to a refractory condition of medication overuse headache, which means a consequent worsening of the headaches¹⁰). As a result of these shortcomings, complementary and alternative medicine has recently become common practice in current headache management^{6, 10-13}).

Yoga exercises are considered to be complementary and alternative medicine and are practiced by approximately 5% of the adult population in the United States and 12% of Australians for alleviating headaches¹⁴). Yoga is a combination of physical postures and breathing exercises. Yoga has been reported as a safe and cost-effective intervention for managing pain^{1, 14}). Evidence for the efficacy of yoga exercise for a number of conditions is emerging. A growing body of evidence also supports the belief that yoga benefits physical and psychosocial health through the mechanisms of down-regulation of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system¹⁵⁻¹⁷). As a result, yoga plays an important role in reducing sympathetic activity, increasing parasympathetic activity, improving quality of life, and decreasing pain levels^{18, 19}). As stated, there is evidence of the benefit of yoga in reducing pain^{20, 21}). However, rigorous methodology and quality of the evidence needs to be examined to establish whether or not we can assert yoga can be used as a complementary and alternative therapy for sufferers of headaches^{22, 23}). Therefore, the aim of this review was to assess the evidence for the effectiveness of yoga exercises in the management of primary headaches.

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SUBJECTS AND METHODS

The review was planned and conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines²⁴, and the Consolidated Standards of Reporting Trials (CONSORT) guidelines for Reporting Parallel Group Randomized Trials²⁵. The Cochrane Library, CINAHL, Embase, PsycINFO, PubMed, and KoreaMed electronic databases were searched to identify RCTs published between 1966 and January 2015. The search terms were as follows: yoga AND headache OR migraine. All potentially eligible studies were retrieved and the full texts of the articles were reviewed to determine whether they met the following selection criteria.

To be eligible, studies had to meet the following conditions. 1) Population: participants in the trials had to meet diagnostic criteria according to the International Classification of Headache Disorders, 3rd edition (beta version) published by the International Headache Society 2013⁸; primary headaches. 2) Intervention: randomized controlled trials were included that used yoga as an intervention to review or reduce symptoms associated with headaches or migraines compared with no yoga. 3) Outcomes: primary outcomes were headache intensity, frequency, and duration; secondary outcomes were anxiety and depression scores, and symptomatic medication use. Quality assessment of the articles was conducted using the critical appraisal, Cochrane risk of bias tool for RCTs, which was recommended by the Cochrane Handbook for systematic Reviews of Interventions²⁶. The Cochrane risk of bias tool is a six-item list designed to assess sequence generation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting, and other potential sources of bias. Each item is rated as “yes”, “no”, or “unclear”. According to the Cochrane Handbook, the quality of clinical trials can be divided into three levels²⁷. When the study design fully meets the preceding six criteria, it is considered A level, which means a low risk of bias. B level is assigned when one or more criteria are partly met, and when one or more criteria are not met, the study is defined as C level, implying high risk of bias. Studies rated as C level should be eliminated²⁴. No meta-analysis was performed as only one study was identified.

RESULTS

A total of 179 titles related to the search terms were screened. Among these, there were 32 potential trials identified from CHINAL, 52 from KoreaMed, 43 from PsycINFO and 52 from the PubMed databases. After the titles had been retrieved a total of 121 studies were excluded either because they were duplicates or they were case studies, commentaries, review articles, or had no target concepts, which means no headaches or migraines. The remaining 58 abstracts were retrieved. After assessing the abstracts, 24 studies were excluded because there was no yoga intervention. Thirty-four potential trials were identified in the search conducted in January 2015. Thirty-four potentially relevant papers were retrieved for evaluation of the full text. After evaluation of the 34 full texts, 33 studies were excluded, because 30 studies had no randomized trials and 3 studies had no full text of

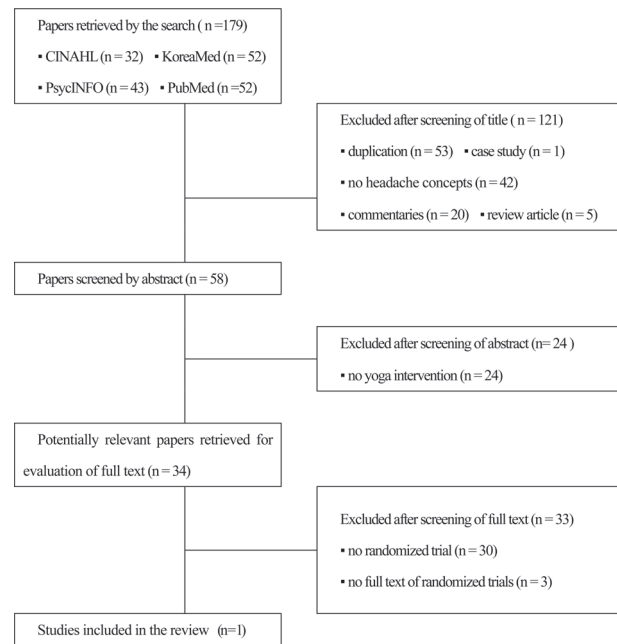


Fig. 1. Flowchart of included studies through the literature searches

RCT. The literature retrieval process is depicted in Fig. 1. The characteristics of the included study are also presented (Table 1).

The one RCT originated in India²⁸. The trial was conducted at the Zoology department of a University. Participants were recruited from a headache clinic of the NMP medical research institute by advertising in local newspapers. The sample size of the trial totaled 72 participants. The participants' mean age was 34.2 years, and they had primary headaches with migraines.

The yoga program comprised yoga postures, breathing and pranayama, and kriya etc. Yoga postures included physical exercises such the stretching of the neck, shoulder and back muscles, followed by relaxation, toning, strengthening, and flexibility. Breathing and pranayama means conscious breathing, kriya was practiced as a jalaneti (nasal water cleansing) and kapalbhanti (forced exhalations). Program length, frequency, and duration of one trial was 60 minutes a day, 5 days per week for 3 months. Yoga was performed under the guidance and supervision of a yoga therapist.

One trial was identified that compared a control group with a yoga intervention group and evaluated the effect on headaches. The available data could only be included as a narrative description. Headache intensity ($p<0.001$), headache frequency ($p<0.001$), anxiety and depression scores ($p<0.001$), and symptomatic medication use ($p<0.001$) were significantly lower in the intervention group than in the control group (Table 1). Neither included trial reported data on adverse effects of treatment (Table 1).

Assessments of each methodological quality item of the one included trial are described (Table 2). The quality of the one trial was level B.

Table 1. Characteristics of included randomized controlled trials

Author, year, location	Participants	Interventions	Outcome measures	Main results	Adverse events	Limitations
		Experimental group	Control group			
	Population	Interventions				
	Sample size (N; EG/CG)	Delivery method				
	Mean age (years; EG/CG)	Duration				
	Drop out n (%)	Interventionist				
John et al., 2013, India/Rajasthan	General person 72 (36/36) 34.2 (34.3/34.2) 7 (9.7)	Yoga postures, pranayama, kriya 60 min per day, 5 days per week 3 months Yoga therapist	Self-care Education Once a month 3 months Handouts	Headache intensity Headache frequency Headache duration Anxiety-depression scores Symptomatic medication use	(p<0.001) (p<0.001) (p<0.001) (p<0.001)	Absence of a placebo groups. No blinding. All subjective outcome measures. No long-term follow-up data

EG: experimental group; CG: control group; N: number

Table 2. Methodological quality summary of included trials

Study, year	Random allocation	Allocation concealment	Blinding	Incomplete outcome	Selective reporting	Other bias	Quality level
John et al., 2013	+	+	?	+	+	+	B

+: criteria met; -: criteria not met; ?: unclear whether criteria were met

DISCUSSION

The purpose of this review was to assess the evidence for the effectiveness of yoga interventions for primary headaches when compared to no yoga. A meta-analysis combining results from all the trials was not possible because only one study was identified. Only one RCT was identified and included in this review. Its interventions included yoga poses, pranayama, and kriya to manage headaches or migraines. One trial reported a significant decrease in headache intensity, headache frequency, anxiety and depression scores, and symptomatic medication use in the trained group. If required, participants were allowed to take acute medication prescribed by neurologists during the trial. The effects of the medication could have diminished the efficacy of yoga exercises for alleviating headaches. In spite of both groups having received medication, reduction in the outcome of the yoga group was significantly higher than that of the control group. As stated in previous studies, these results support yoga practice as a means of evidence-based positive management of headaches or migraines^{20, 22, 28, 29}. The quality rating of the trial included in this review had a moderate methodological quality, and the trial did not mention blinding. However, no strong conclusion can be made due to the number of small trials and other methodological considerations.

The strength of this systematic review includes the use of strict methodological criteria. Major strengths of this group of studies include the study, the use of randomization, and the quality of measurement tools. This may be the first comprehensive review of yoga exercises for headaches. No

adverse effects associated with yoga practice were described.

This study had some limitations. First, the trial had no placebo group. This may have led to favorable effects in the yoga group. Second, the trial did not mention blinding, lack of which may have threatened the internal validity of the trial. Third, all the outcome measurements were questioner-based and subjective; objective parameters were lacking. Therefore, evidence-based research employing objective outcome parameters is needed to identify the efficacy of integrated yoga therapy for headaches. Fourth, the trial had no long-term follow-up data concerning the durability of the treatment effect. Finally, the generalizability of the findings was limited due to the number of small trials and their partially limited quality. However, this one trial does provide a strong basis for future studies and suggests that yoga exercises could provide a safe, cost-effective therapy for the growing public health issue of headaches. Furthermore, this review contributes to the development of knowledge in physical therapy about how sufferers with primary headaches can manage themselves.

In conclusion, although this review retrieved only a limited number of small trials, of partially limited quality, its findings suggest that yoga practice can effectively alleviate symptoms associated with primary headaches. However further rigorous methodological and high-quality RCTs are needed to confirm and further comprehend the effects of standardized yoga programs aiming to control pain intensity and frequency, symptoms, and medication use etc., in the treatment of primary headaches.

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