A Systematic Review on Effectiveness of Rajyoga Meditation on Chronic Tension Type Headache

Dr. Anita Nawale[1], Satya Lakshmi K[2], Dr. Sathyanath D[3], Dr. Shrikanth Muralidharan[4]*
[1]Associate Professor, Bharati Vidyapeeth College of Nursing, Pune
[2]Professor (Dr.) Director, National Institute of Naturopathy, Ministry of Ayush, Pune.
[3]Senior Medical Officer, National Institute of Naturopathy, Ministry of Ayush, Pune.
[4]*Course Coordinator, Department of Research, National Institute of Naturopathy, Ministry of Ayush, Pune.
DOI: 10.47750/pnr.2022.13.S01.193

Abstract

Introduction– Headache is a very common complains of almost every individual. There is a high prevalence of headache disorders, including migraine, tension-type headache, and medication-over use headache affecting quality of life, productivity and cost of treatment. It may be a cause of any other associated condition or it may be an effect of any other co-morbidity. The effectiveness of Rajyoga meditation on severity, frequency and duration of chronic tension headache was assessed in the present review. Methods–Databases such as PubMed, Google Scholar, Scopus and Cochrane were systematically searched for current evidence of randomized controlled trials on Rajyoga meditation. Studies related to chronic tension headache were included of the past 20 years. The entire study was carried out from Feb 2022 to April 2022. **Results**- Two studies were included in the final study. Rajyoga meditation group patients showed a highly significant reduction in headache variables as compare to those who received medication. There was significant change in severity of headache, frequency and duration of headache in Rajyoga meditation group. It also showed the significant effect on anxiety and depression score. **Conclusion**- Rajyoga meditation was effective in reducing headache and associated symptoms in chronic headache patients. However large samples RCTs are required to confirm this conclusion.
Keywords –Chronic tension headache, Rajyoga, Meditation

Introduction

Headache is a very common complaint of every individual [1]. There is a high prevalence of headache disorders of different types such as migraine, tension-type headache, and medication-over use headache affecting the overall quality of life, productivity and enhancing the financial burden [2].The Global Burden of Disease study ranks headache disorders as the second leading cause of years lived with disability world-wide [3]; migraine alone is third among people aged 15 to 49 years. Headaches may be a cause of any other associated condition or it may be an effect of any other co-morbidity. Prevalence of headache has been reported by 64 % of people all over the India, out of which 35% of patients have chronic tension type headache [4]. Compared to other types of headache, chronic tension type headache (CTTH) is very common in population and it can be episodic or chronic [5]. It is also known as stress headache. It is diagnosed when a person has headache for more than 15 days a month for at least 3 months [6], commonly last from 30 minutes to seven days [2,7]. The pain is generally described on both sides of the head (bilateral), as "a band around the head". The pain is mild to moderate and does not worsen with routine physical activity, which means that most people with tension-type headache continue about their normal daily activities despite the headache. In some people it restricts their ability to carry out their work [8]. One year prevalence of chronic tension type headache is about 2-5%in general population and half of them have reported of its impact on their working ability [5] . This type of headache is usually treated as over the counter medications such as Paracetamol, Aspirin, Ibuprofen and other available pain killers. These medications have side effects on the long run such as nausea, loss of appetite, itching , rash, dark urine, clay stool, jaundice etc [9]. There can be serious harmful effects of such medication being used for long time resulting in gastrointestinal bleeding (non-steroidal anti-inflammatory drugs), liver damage (acetaminophen), addiction (opioids), memory impairment and depression (topiramate), cardiac arrhythmias, seizures (amitriptyline) [3]. Patients with high headache frequency are particularly at risk of excessive misuse of medication resulting in medication overuse headache [7,10]. In order to protect the patient from such harmful effects of medication effective non-pharmacological therapy is required. There are alternative therapies used to treat it without medication like biofeedback [11], relaxation, and cognitive-behavioral therapy, acupuncture, massage therapy or physical therapy. The science of yoga has its origin thousands of years ago which believes that health and wellness is dependent on balance between mind, body and spirit [12]. It has been proven to be successful in various chronic conditions such as diabetes, hypertension and arthritis. There are studies where yoga has helped to control blood sugar level, blood pressure and reduce anxiety as well as depression. Among

the different forms of Yoga and meditation techniques such as mindfulness, pranayama; Rajyoga is the supreme or highest yoga which helps to rule the mind, sense organs and the body. Practice of Yoga gives sense of calmness, increase patience, reduce anger and delusion [13]. According to Mehta et al., Rajyoga meditation is an effective adjunctive therapy to reduce obsessions and compulsions in patients with OCD [14]. Mishra et al., concluded that Rajyoga meditation was effective in reducing systolic and diastolic blood pressure in cardiac patients [15]. According to Shaha et al., it was more effective in treating and preventing physical, mental illness and wellbeing [16]. Babu et al. state that Rajyoga meditation practice enhances gray matter volume of specific brain regions and positive thoughts [17]. Above all studies support that Rajyoga was effective in physical as well as mental health issues, it is being followed for other disorders, but less for CTTH. Hence more evidence is needed for better clinical application of the Rajyoga as a treatment for CTTH patients. The present review is focused on the effect of Rajyoga with regard to the severity, frequency and duration of headache in CTTH patients in order to assess if there was sufficient evidence generated to support its clinical use on regular basis for the cases with CTTH.

Methods

The study was conducted from February 2022 to May 2022. The review was registered in Prospero (CRD42022323083).This systematic review followed the PRISMA guidelines as shown in flow chart 1.

Search Strategy

Entire search was carried out in a period of 3 months from February 2022 to April 2022. Following database was searched with 20 years of time period restriction: PubMed, Google Scholar, Scopus, and Cochrane. Strategic search terms used were "rajyoga meditation", "tension type headache", "chronic tension headache" The search strategy for PubMed-involved terms is mentioned in Table 1. The articles were initially screened for the title and abstract. Later on a full text screening was done. Articles were included if they were randomized or non-randomized trials investigating the effect of Rajyoga meditation on chronic tension headache. Screening led to selection of 2 articles [18,19]. Full texted articles were assessed independently by two authors and discrepancies were resolved by discussion among all three authors.

Table 1: Search strategy for articles in PubMed

Searches	Search strategy
Google scholar	Effect of "rajyoga meditation" on migraine or tension headaches
PubMed	#1Search: (Rajyoga) AND (tension type headache) "Rajyoga"(All Fields) AND ("tension type headache"(MeSH Terms) OR ("tension type"(All Fields) AND "headache"(All Fields)) OR "tension type headache"(All Fields) OR ("tension"(All Fields) AND "type"(All Fields) AND "headache"(All Fields)) OR "tension type headache"(All Fields))
PubMed	#2Search: (Rajyoga) AND (chronic tension headache) "Rajyoga"(All Fields) AND (("chronic"(All Fields) OR "chronical"(All Fields) OR "chronically"(All Fields) OR "chronicities"(All Fields) OR "chronicity"(All Fields) OR "chronicization"(All Fields) OR "chronics"(All Fields)) AND ("tension type headache"(MeSH Terms) OR ("tension type"(All Fields) AND "headache"(All Fields)) OR "tension type headache"(All Fields) OR ("tension"(All Fields) AND "headache"(All Fields)) OR "tension headache"(All Fields))) #1 AND #2

Study selection

Inclusion criteria for this systematic review were studies investigating the effect of Rajyoga meditation on headache variables such as frequency, duration and intensity of headache among chronic tension headache patients. Only English language articles were included. The following exclusion criteria were applied: Review articles, meta-analysis, systematic reviews, conference proceedings, books, unpublished data, case reports and articles that did not evaluate the effect of Rajyoga on headache parameters.

Data Extraction and Quality Assessment-

All data were independently extracted by the first author and cross verified independently by the other authors. Following information was sought from each article: Authors, Year of Publication, and Type of study design, participants, age range, duration, comparators, outcome measures etc. as shown in table no 2. JADA scale was sued for risk of bias assessment. Reviewers did not contact the authors to request any additional information about the study.

Results

As shown in PRISMA flow chart 1, a total of 76 articles were identified from database search. After removing duplicates 75 articles were screened for title and abstract. 68 articles were excluded as they were not related to study objectives. 6 articles were screened for inclusion and exclusion criteria. 4 articles were removed as they were showing variation in type of medication and method of meditation. Only two studies were included in the review as they were having similar intervention and primary outcome measures [18,19].

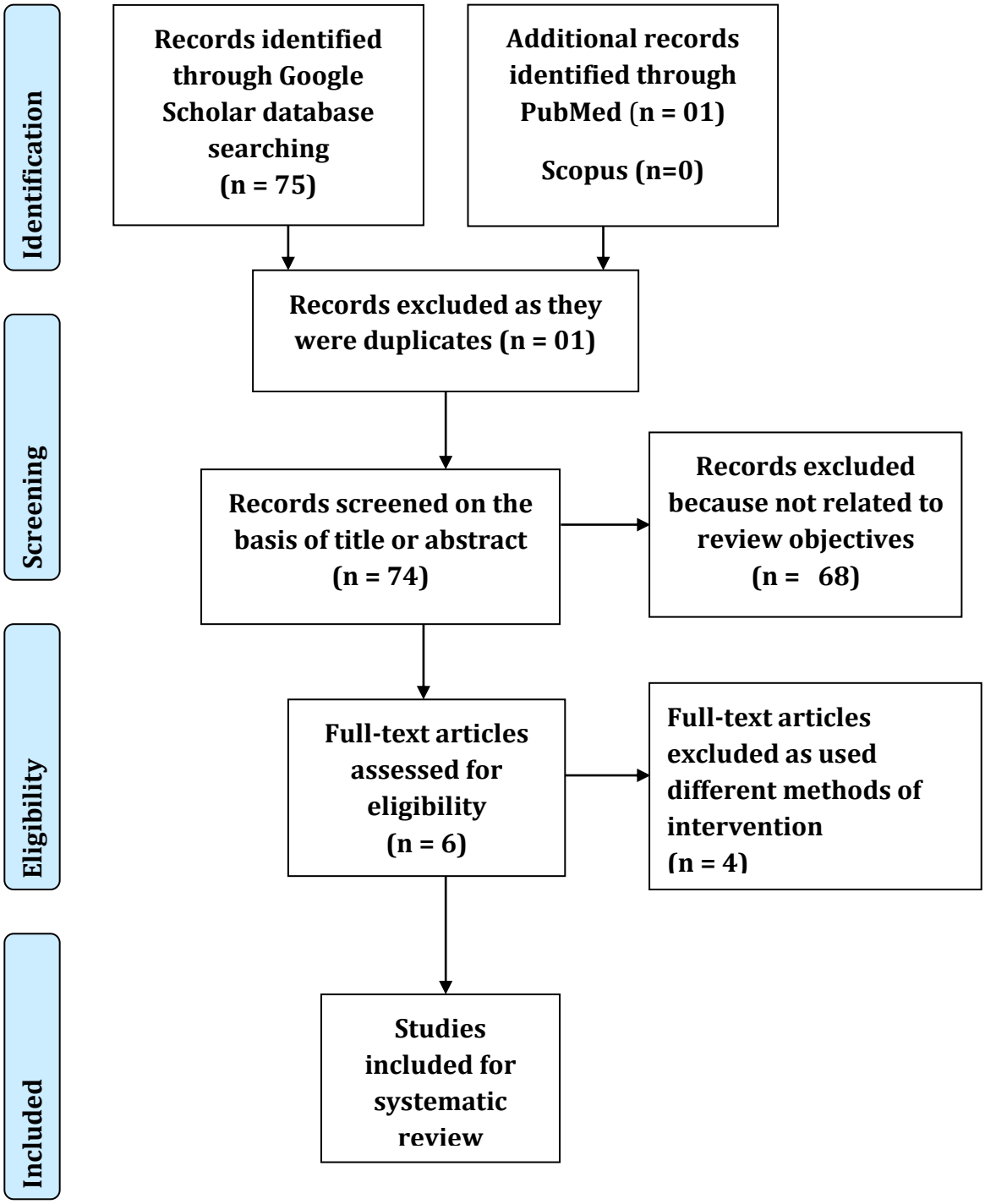

Figure 1 - PRISMA flow diagram describing the selection process for identifying studies included in systematic review.

PICOT Criteria: The studies were selected which followed following criteria. Participants were adult patients of CTTH from the age group above 18 years,

Participants who received Rajyoga meditation as an intervention, and compared with the group of CTTH patients who received regular medication, duration of intervention ranged from 8 weeks to 3 months.

The review was conducted from February 2022 to May 2022. The literature searched based on the pre decided criteria fetched 2 articles in all [18,19]. Both articles had measured similar primary outcome as follows. Headache variables like severity of headache (0 to 10 Visual pain analog scales), frequency and duration of headache (daily dairy), headache index (multiplying severity and frequency of headache per week), 2. Anxiety and Depression level (Hamilton anxiety and depression scales). One of the authors had assessed plasma cortisol level as a secondary outcome [19].

Quality of study

The characteristics and methodological quality of selected studies are summarized in table 2. Both the studies did not report detail process about randomization and blinding of participant or the investigator. Studies were selected based on PICOT model of inclusion and exclusion criteria. Both the studies had similar inclusion and exclusion criteria.

Following inclusion criteria for participants was followed–

1. Known patients of chronic tension type headache,
2. Selected based on criteria of Ad-hoc Committee of Classification of Headache,
3. Having headache for more than 2 years,
4. Associated with mild anxiety and depression

Rajyoga meditation was practiced by experiment arm group along with regular medication. Experiment group was compared with control group who received only regular medication. In both studies 8 weeks and 3 months intervention was done respectively to see the effect of Rajyoga meditation.

Primary outcome

Participants were comparable at demographic variables like age, gender, social and marital status, duration of headache. One study [19] has mentioned the name of drug, dose and frequency received by the control group.

Headache variables-

Kiran et al. (2016); reported that headache relief was 95% in meditation group as compared to 34 % in control group patients. This study did not mention the details of medication provided to control group [18]. Kiran et al. (2005); reported that headache relief was 96% in meditation group as compared to 25 % in Alprazolam group patients [19].

Anxiety and Depression –

It was measured by Hamilton anxiety and depression scales. In first study anxiety and depression was relieved up to 92% and 87% respectively in experiment group compare to 34% and 38% in medication group [18]. In second study Anxiety and depression was reduced up to 70% and 61 % in experiment group compare to 31% and 22% in medication group respectively [19]. Second study also reported that 90% of patients complains like irritability, giddiness and nausea were also reduces in meditation group [19]. They felt very cheerful and confident in handling their daily stress and day to day problems. Their attitude became positive.

Secondary outcome

Kiran et al. (2005) had also observed the plasma cortisol level [19]. The mean plasma cortisol level was found to be lower than normal before intervention in both the groups. However these values were optimized after meditation. The initial plasma cortisol level was 5.68 ±3.92 changed to 7.31 ±4.13 after 8 weeks of Rajyoga meditation. The difference was statistically significant as $p<0.005$.

Adverse Effect

Adverse effect was not reported in both the studies.

Table 2 - Characteristics of selected studies-

Sr. No	Author	Year	Country	Study Design	Sample Size	Inclusion criteria	Duration of intervention	Comparator	Outcome measurement	Before Intervention	After intervention	Remark
1	Kiran et al. [18]	2016	India	Randomized Single Blind Parallel design-Prospective study	100	1. known patients of chronic tension type headache 2. Selected based on criteria of Ad-hoc Committee of Classification of Headache. 3. Having headache more than 2 years. 4. Associated with mild anxiety and	8 weeks	Medication (details were not included)	**1 Severity** (0 to 10 VAS scale), 2 **Frequency** 3 **Duration of** Headache (Headache Diary), **4 Headache Index**, **5 Anxiety** and 6 **Depression**	**1)**5.92±1.50 2) 5.73±1.97 3)8.53± 3.73 4)35.83±14.77 5)2.25±0.68 6)1.40±0.56	1)0.77±1.17 2)0.80±1.07 3)0.56± 0.99 4)1.78±3.40 5)0.18±0.39 6)0.17±0.38	As $p<0.001$ Highly significant reduction in headache parameters, anxiety and depression levels was seen

						depression. 5. >18 years			(Hamilton scale)			
2	Kiran et al. [19]	2005	India	Randomized Trial	380	1. known patients of chronic tension type headache 2. Selected based on criteria of Ad-hoc Committee of Classification of Headache. 3. Having headache more than 2 years. 4. Associated with mild anxiety and depression. 5. >18 years	3 months	Tab. Alprazolam 0.25 mg twice a day for 3 months	**1 Severity**(0 to 10 VAS scale), 2 **Frequency** 3 **Duration** of Headache, (Headache Diary), **4 Headache Index**, **5 Anxiety** and 6 **Depression** (Hamilton scale) 7 **Plasma cortisol** Level,	1)5.9±0.99 2)5.5±4.84 3)12.26±7.0 4)31.97±8.4 5)1.89±0.49 6)1.01±1.01 7)5.68 ±3.92	1)1.1±1.29 2)1.1±1.29 3)1.17± 1.3 4)1.6±1.39 5)0.83±0.5 6)0.3±0.49 7)7.31±4.13	As p<0.001 Highly significant reduction in headache parameters, anxiety and depression was seen Plasma cortisol value was optimized significantly

Table- 3. Jadad Scale-

Author	Was the study described as randomized?	Was the method of randomization appropriate?	Was the study described as blinding?	Was the method of blinding appropriate?	Was there a description of withdrawals and dropouts?	Was there a clear description of the inclusion/exclusion criteria?	Was the method used to assess adverse effects described?	Were the methods of statistical analysis described?
Kiran et al. [18]	Not clear	No	No	No	Yes	Yes	No	Yes
Kiran et al. [19]	Yes	Not clear	Not clear	Not clear	Yes	Yes	No	Yes

Discussion-

This systematic review summarizes the currently available RCT on effectiveness of Rajyoga meditation on severity, frequency and duration of CTTH. Study done by Romero-Godoy et al. showed the relation between anxiety, depression and CTTH [20]. It is observed that CTTH patients have significantly higher level of anxiety and depression compare to normal person [21]. Another study done by Chalana et al. showed significant improvement in anxiety and depression score after 6 weeks of Rajyoga meditation [22]. Anxiety and depression may be the central causes of CTTH, which is much common and a neglected aspect of daily routine. Hence Rajyoga stands as an essential practice to ensure relief from pain. There was also an evidence of change in cortisol level after Rajyoga meditation among the patients undergoing a Coronary Artery Bypass Graft operation [23]. Rajyoga meditation had good effect on affective and cognitive functions. It was observed that it improves the hope and happiness score [24]. Prophylactic medication is used by CTTH patients with higher headache frequency, higher headache burden, worse sleep quality, and higher depression. Many studies showed that there was overuse of medication in patients with chronic complaints of headaches. Medication was effective only in 25% of patients to relive the complete pain. Remaining 75 % to 80% patients had experienced mild to moderate headache after taking the medication also. It provides temporary relief from headache during the episode [25-27]. Therefore the use of Rajyoga can serve as a permanent solution to the problem. The primary strength of our study is the use of systematic approach. This is the first review to assess the effectiveness of Rajyoga meditation on severity, frequency and duration of chronic tension headache. The review thus indicates that Rajyoga meditation for duration of 3 months was effective on severity, frequency and duration of chronic tension headache. There was no data available on long term effect of Rajyoga meditation on chronic tension headache in all the studies included in systematic review.

Conclusion-

Based on our current systematic review Rajyoga meditation was effective on severity, frequency and duration of chronic tension headache. In addition it was effective in reducing anxiety and depression along with associated somatic symptoms. Patient also develops positive thoughts and improved work efficiency. More studies are needed on larger sample size with systematic research methodology to ensure greater evidence.

Limitation-

The analysis we conducted has certain limitations. One of the major limitations of this systematic review is that only two studies were available on effect of Rajyoga meditation on CTTH. Both studies were done in Indian set up. No study was available from any other country. There is a chance of high risk of bias as no blinding was done and these trials were conducted without adequate concealment and sample size was also small. Randomization process was not described adequately. Long duration follow up was not recorded by the researchers.

Declaration of conflict of interest-

Nil

Funding-

Nil

Authors' Contributions-

Articles falling in the inclusion criteria were extracted and generalized search using keywords was done by AS, pooling of selected articles and more specific search was done by AS and SM All authors provided critical feedback and helped in preparation of manuscript. The authors read and approved the final manuscript.

References-

1. Bakhshani NM, Amirani A, Amirifard H, Shahrakipoor M. The Effectiveness of Mindfulness-Based Stress Reduction on Perceived Pain Intensity and Quality of Life in Patients With Chronic Headache. Glob J Health Sci. 2015;8:142–51.
2. Anheyer D, Klose P, Lauche R, Saha FJ, Cramer H. Yoga for Treating Headaches: a Systematic Review and Meta-analysis. J Gen Intern Med (Internet). 2020;35:846–54.
3. Couch JR. Update on chronic daily headache. Curr Treat Options Neurol. 2011;13:41–55.
4. Saylor D, Steiner T. The Global Burden of Headache. Semin Neurol (Internet). 2018;38:182–90. Available from: http://www.thieme-connect.de/DOI/DOI?10.1055/s-0038-1646946
5. Mousavi SA, Mirbod SM, Khorvash F. Comparison between efficacy of imipramine and transcutaneous electrical nerve stimulation in the prophylaxis of chronic tension-type headache: A randomized controlled clinical trial. J Res Med Sci. 2011;16:923–7.
6. Pérez-Llanes R, Ruiz-Cárdenas JD, Meroño-Gallut AJ, Fernández-Calero MI, Ríos-Díaz J. Effectiveness of sub-occipital muscle inhibition combined with interferential current in patients with chronic tension-type headache: a randomized controlled clinical trial. Neurologia (Engl Ed). 2020 Apr 25:S0213-4853(20)30042-6. English, Spanish. doi: 10.1016/j.nrl.2019.12.004.
7. Patel S, Achana F, Carnes D, Eldridge S, Ellard DR, Griffiths F, et al. Usual care and a self-management support programme versus usual care and a relaxation programme for people living with chronic headache disorders: a randomised controlled trial protocol (CHESS). BMJ Open. 2020;10:33520.
8. Porst M, Wengler A, Leddin J, Neuhauser H, Katsarava Z, von der Lippe E, Anton A, Ziese T, Rommel A. Migraine and tension-type headache in Germany. Prevalence and disease severity from the BURDEN 2020 Burden of Disease Study. Journal of health monitoring 2020; *5*: 2–24. https://doi.org/10.25646/6990.2 9.
9. Ashina S, Buse DC, Bjorner JB, Bendtsen L, Lyngberg AC, Jensen RH, Lipton RB. Health-related quality of life in tension-type headache: a population-based study. Scandinavian journal of pain 2021; 21:778–787. https://doi.org/10.1515/sjpain-2020-016610.
10. Schiller J, Karst M, Kellner T, Zheng W, Niederer D, Vogt L, et al. Combination of acupuncture and medical training therapy on tension type headache: Results of a randomised controlled pilot study. Cephalalgia. 2021;41:879–93.
11. Fernández-De-Las-Peñas C, Florencio LL, Plaza-manzano G, Arias-buría JL. Clinical reasoning behind non-pharmacological interventions for the management of headaches: A narrative literature review. Int J Environ Res Public Health. 2020;17:1–16.
12. Brooksa A, Sharona R, Oved D. Advantages of Yoga in the Treatment of Primary Headaches. Altern Integr Med. 2021;10:1–6.
13. Rajoria K, Singh SK. Therapeutic benefits of Raj Yoga – A review. Indian Journal of Traditional Knowledge 2017;16:88–95.
14. Mehta K, Mehta S, Chalana H, Singh H, Thaman RG. Effectiveness of Rajyoga meditation as an adjunct to first-line treatment in patients with obsessive compulsive disorder. Indian J Psychiatry (Internet). 2020;62:684–9. http://www.ncbi.nlm.nih.gov/pubmed/33896974
15. Mishra E, Mishra A, Mishra C, Dash R, Rout R. Effect of Rajyoga meditation on modifiable cardiovascular risk factors. Int J Appl Res. 2018;4:371–2.
16. Shaha R, Gupta S. Role of Rajyoga meditation as a psychotherapy in various physical and mental illnesses and well-being. Indian J Posit Psychol (Internet). 2018;9. https://www.myresearchjournals.com/index.php/IJPP/article/view/11753
17. M G RB, Kadavigere R, Koteshwara P, Sathian B, Rai KS. Rajyoga Meditation Experience Induces Enhanced Positive Thoughts and Alters Gray Matter Volume of Brain Regions: A Cross-sectional Study. Mindfulness (N Y) (Internet). 2021;12:1659–71. https://link.springer.com/10.1007/s12671-021-01630-8
18. Kiran, Girgla KK, Chalana H, Singh H. Effect of rajyoga meditation on chronic tension headache. Indian J Physiol Pharmacol. 2014;58:22–5.
19. Kiran U, M PR. the Effect of Autogenic Relaxation on Chronic Tension Headache and in Modulating Cortisol Response. Indian J Anaesth. 2005;49:474–8.
20. Romero-Godoy R, Romero-Godoy SR, Romero-Acebal M, Gutiérrez-Bedmar M. Sensory Thresholds and Peripheral Nerve Responses in Chronic Tension-Type Headache and Neuropsychological Correlation. Journal of Clinical Medicine MDPI AG; 2022;11:1905. https://doi.org/10.3390/jcm11071905
21. Belimova LN, Balyazin VA. Using pharmacopuncture for chronic tension-type headache treatment. Saratov Med J. 2021;2:e0201. DOI: 10.15275/sarmj.2021.0201
22. Kiran CH, Arora AK, Girgila KK. Original article effect of short term rajyoga meditation on anxiety and depression. Pak J Physiology 2014;10:18–20.

23. Kiran U, Ladha S, Makhija N, Kapoor PM, Choudhury M, Das S, et al. The role of Rajyoga meditation for modulation of anxiety and serum cortisol in patients undergoing coronary artery bypass surgery: A prospective randomized control study. Annals of cardiac anesthesia 2017; 20:158–162. https://doi.org/10.4103/aca.ACA_32_17
24. Misra N, Gupta A.K, Alreja S, Prakash O. Effect of Raj Yoga Meditation on Affective & Cognitive Functions. International Journal of Health Sciences and Research 2013; 3:38-46.
25. Palacios-Ceña M, Wang K, Castaldo M, Ordás-Bandera C, Torelli P, Arendt-Nielsen L, et al. Variables Associated With the Use of Prophylactic Amitriptyline Treatment in Patients With Tension-type Headache. Clin J Pain (Internet). 2019;35:315–20. https://journals.lww.com/00002508-201904000-00003
26. Kristoffersen ES, Faiz KW, Hansen JM, Tronvik EA, Frich JC, Lundqvist C, et al. The management and clinical knowledge of headache disorders among general practitioners in Norway: a questionnaire survey. J Headache Pain (Internet). 2021;22:136. https://thejournalofheadacheandpain.biomedcentral.com/articles/10.1186/s10194-021-01350-3
27. Fernández-de-las-Peñas C, Palacios-Ceña M, Castaldo M, Wang K, Guerrero-Peral Á, Catena A, et al. Variables associated with use of symptomatic medication during a headache attack in individuals with tension-type headache: a European study. BMC Neurol (Internet). 2020;20:43. https://bmcneurol.biomedcentral.com/articles/10.1186/s12883-020-1624-8