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Effect of yogic practice on knee osteoarthritis - A review

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Abstract
Objective: To evaluate the effect of Yogic intervention on Patients with Knee Osteoarthritis (KOA) in terms of pain management, mobility, and quality of life (QOL).
Method: PubMed, Google Scholar, ResearchGate, and other sources were searched systematically in this study.
Result: A total of 8 articles on patients with Knee Osteoarthritis met the inclusion criteria. The most common yoga Protocol is around 40~60 minutes/session, lasting for 1- 12 weeks. The effect of yoga on pain relief and improvement in movement could be seen after 2 weeks of the intervention.
Conclusion: This systematic review showed that yoga might have positive effects in physical movement (mobility of knee) and QOL on patients with KOA, but the effects on pain management are less clear. Besides, more outcome measures related to the mental health effects of yoga in people with KOA should be conducted.

Keywords: Yoga, knee osteoarthritis (KOA), quality of life (QOL)

Introduction

Osteoarthritis of the knee is associated with degeneration of the articular cartilage of the joint. [1] It is characterized by functional disability causing pain, swelling, and stiffness, affecting the person's quality of life. [2] With a prevalence of 22% to 39% in India, osteoarthritis is the most common joint disease. Around 45% of women over 65 experience symptoms, and 70% of those over 65 have radiological evidence. One of the primary reasons for reduced mobility, especially in women, is knee osteoarthritis. Researchers estimated that osteoarthritis caused the tenth most common nonfatal burden. [3] Pain in and around the joints, stiffness in the early morning hours, and restricted joint movement accompanied by muscle weakness characterize the symptoms of osteoarthritis. Knee osteoarthritis is associated with a poorer quality of life, obesity, sedentary behaviour, depressive symptoms, insomnia, and reduced exercise. [4] Currently, healthcare professionals frequently use physiotherapy, weight management, various pain relievers (NSAIDs), intra-articular steroid injections, knee replacement surgery, and other therapeutic interventions to treat knee osteoarthritis. [5] Non-pharmacological interventions, including exercise, yoga, an integrated approach to yoga therapy, Tai-Chi, acupressure, naturopathy, marma therapy, and massage therapy, have been found to enhance the quality of life in patients with knee osteoarthritis. These interventions also lead to a decrease in pain, improved physical functions, and psychological equilibrium. [5, 6, 7]

The current guidelines for the treatment of knee osteoarthritis propose a "conditional recommendation" for yoga as an additional form of exercise, but only for short-term management. The guidelines emphasize the absence of supporting evidence and the substandard quality of the available evidence. [8] Apart from this, many studies suggest that yoga could be beneficial in enhancing pain relief, functionality, and stiffness reduction in individuals suffering from knee osteoarthritis. [9]

Methods

1. Database Sources and Search Strategy

In order to locate relevant randomised controlled trials (RCTs) that have been published up to the present time, a thorough search was carried out on Google Scholar, PubMed, and ResearchGate. There were a number of key phrases that were utilized, including osteoarthritis, knee, yoga, randomized controlled trial, pain, mobility, balance, symptoms, and quality of life. The criteria for inclusion were research that utilized yoga as a treatment for knee osteoarthritis, but the criteria for exclusion were designed to avoid bias and guarantee that the papers that were picked were of a high quality. As a potential therapeutic intervention, yoga has garnered a lot of attention in the context of knee osteoarthritis. For the purpose of investigating the effectiveness of yoga in the management of knee osteoarthritis, the eight research articles that were chosen represent a solid foundation because they satisfy both the inclusion and exclusion criteria.

2. Selection Criteria

Articles were deemed to be included in the study if they fulfilled the following criteria: (1) the studies were published in English; (2) the patients had clear diagnostic criteria of KOA; and (3) the intervention type of experimental group was yoga. A patient who had been diagnosed with secondary KOA, an animal study, or an article that had been published as conference processing were all things that were not considered for inclusion. The scope of this analysis was all of the papers that were published in the Scopus repository.

3. Participants

All of the participants fell within the range of 31 to 250. In some of the research, the majority of the participants were adults over the age of 55, whereas in other studies, the participants were largely adults aged 18 and older. The majority of the studies found focused on women suffering from knee osteoarthritis. According to the requirements of the research, participants must satisfy all of the inclusion and exclusion criteria. We considered only the final participants in this study, excluding those who refused to take part, were excluded, or were lost to follow-up.

Yoga intervention

There Were a total of eight articles reviewed in this study, three of which had a Yogic intervention lasting eight weeks, and three of which had a Yogic intervention lasting twelve weeks. The typical duration of the practice is between forty and sixty minutes per day. Surya namaskar, loosening series, relaxation,
asana, pranayama, meditation, and Yogic sukshma Vyayam were some of the IAYT interventions that were listed in the study. An additional session on the yogic lifestyle, including the Yamas, Niyamas, Jnana Yoga, Karma Yoga, Bhakti Yoga, and other yoga practices. In addition to this, only a few of the studies have included yogic interventions such as hatha yoga and asana (static postures), in which the individual is required to maintain the postures for the anticipated amount of time. These yogic interventions were delivered in three different modes: through offline sessions held at fitness centres, through home-based yoga sessions delivered via telemedicine, and through some of the interventions being delivered through pre-recorded sessions.

Reviewed articles table: Table below consist of total no of 8 articles were reviewed. All articles including RCTs and pilot study.

S.no	Author & year	Study, Time, Duration and Intervention	Sample, Design, Age Group	Data collection	Conclusion
1.	Cheung, C., Wyman, J. F., Resnick, B., & Savik, K. (2014).	The yogic intervention of 8 week home based program. Hathayogic practices given in yogic intervention which is developed by 5 experts.	Pilot Randomized control trial with pre and post include 36 participants of age 72 years.	WOMAC BMI QOS (PQSI) QOL (SPPB)	A yoga program that can be done at home is not only practicable but also acceptable and safe for older ladies who suffer from knee osteoarthritis.
2.	Deepeshwar, S., Tanwar, M., Kavuri, V., & Budhi, R. B. (2018).	IAYT intervention for 1week at yoga center of SVYASA.	Randomized controlled clinical trial with pre and post data include 66 individual (yoga n=31, control n=35) of age in between 30-75 years.	Falls efficacy scale (FES). Hand grip. Strength test. Timed up and go test. Sit to stand test.	IAYT demonstrates enhanced performance in the TUG, STS, and HGS tests, indicating greater muscular strength, flexibility, and functional mobility in patients with knee osteoarthritis.
3.	Ebnezar, J., Nagarathna, R., Bali, Y., & Nagendra, H. R. (2011) [2].	IAYT intervention given to patients for 40 min per day for 2 weeks (follow-up for 3 months). Intervention was loosening, relaxation, asana, pranayama, meditation and lectures on yama, niyama, jnana yoga, bhakti yoga, karma yoga and yogic lifestyle.	Randomized control trial with pre and post data including 118 (yoga) and 117 (control) of age between 35 to 80 years accessed for final analysis.	Physical health, Emotional health, Energy and fatigue level, Emotional wellbeing, Social functioning, pain and general health (SF36) all domains.	Integrative approach yoga therapy (IAYT) is more effective than therapeutic activities when used in conjunction with transcutaneous electrical stimulation and ultrasound treatment for decreasing knee impairment and enhancing quality of life in individuals with osteoarthritis (OA) knees.
4.	Ebnezar, J., Nagarathna, R., Yogitha, B., & Nagendra, H. R. (2012) [13].	The intervention in these study was of 3 months (40 min per day. Intervention was yogic sukshma vyayama, relaxation, asana,	Prospective randomized active controlled	Tenderness Swelling Crepitus WOMAC	IAYT is better than therapeutic exercises as an adjunct to

		pranayama, meditation, counselling lectures on yama, niyama, jnana yoga, bhakti yoga, karma yoga and yogic lifestyle.		trial with pre post data of patients including 250 patients of age in between 35 to 80 years.	Walking pain Walking time Active range of movements	transcutaneous electrical stimulation and ultrasound treatment in improving walking pain, range of knee Flexion, walking time, tenderness, swelling, crepitus, and knee disability in patients with OA knees.
5.	Bennell, K. L., Schwartz, S., Teo, P. L., Hawkins, S., Mackenzie, D., McManus, F., Lamb, K. E., Kimp, A. J., Metcalf, B., Hunter, D. J., & Hinman, R. S. (2022)	Yogic intervention given through online mode vy the prerecorded video format. Intervention given over 12 weeks (1 video per week and each session to be performed 3 times per week.	Two group superiority randomized controlled trial of 212 adults with symptomatic knee osteoarthritis.	Knee pain during walking, WOMAC, self-reported overall knee pain, stiffness, anxiety, stress, depression, global change, QOL, fear of movement and balance confidence.	A yoga program that is not supervised can increase physical functions, but it does not alleviate knee discomfort.	
6.	Cheung, C., Wyman, J. F., & Savik, K. (2016).	Yoga program consist of one hatha yoga practice for 60 min per session for eight weeks. And additional practice of 30 min for four times in a week.	Randomized controlled trial with population of N=36 of women above age of 65	WOMAC PSQI SPPB BMI SF-12 OEE AND SEE	Better outcomes related to OA are correlated with both the frequency and duration of yoga practice, with a higher frequency of yoga practice being associated with greater improvements in OA symptoms, physical function, sleep, and quality of life. Further investigation is required to identify obstacles that impede consistent yoga attendance and to devise methods for improving sustained adherence to the practice.	
7.	Moonaz, S. H., Bingham, C. O., 3rd, Wissow, L., & Bartlett, S. J. (2015).	Yoga practice of 60 min classes held twice in a week for eight weeks. Classes were taught by specialised and registered yoga therapist of more than 10 years of experience.	A randomized controlled pragmatic trial with the pre and post data on 75 adult participants of 18+ with RA and OA.	PCS, MCS, HRQL (SF-36), Sit and reach box, one leg stance, perceived stress scale, ASES scale, six minute walking and etc.	Preliminary evidence indicates that yoga may assist sedentary individuals with arthritis in increasing physical activity in a secure manner, thereby enhancing their physical, mental, and overall quality of life.	
8.	Kuntz, A. B., Chopp Hurley, J. N., Brenneman, E. C., Karampatos, S., Wiebenga, E. G., Adachi, J. D., ... & Maly, M. R. (2018).	Yoga intervention was led by certified yoga instructor with alignment based postures in static position and some with dynamic movement. Yogic intervention given for 12 weeks with	Randomized controlled trial with convenience of sample of 31 women	KOOS pain Intermittent pain, constant pain, LEFS, KOOS (ADL), KOOS (SR), six minute	The results suggest that the effectiveness of yoga, as practiced in this context, is comparable to that of conventional exercise in terms of enhancing pain relief, self-perceived physical ability, and overall wellbeing. Although the yoga program showed positive effects on	

		each of three interventions with yoga.		walk, 40 meter walk, 30sec chair stand, timed up and go, stair ascent and etc.	pain and selfreported function when compared to no exercise, it did not result in improvements in objective measures such as strength and mobility performance in the analyses comparing different groups.

Discussion

In order to determine the impact that yoga has on pain, mobility, and quality of life in those who suffer from KOA, this review will be conducted. Even though the majority of these studies appear to demonstrate a positive effect following yoga intervention, this review nevertheless contains some findings that are inconsistent with one another. Chronic pain is one of the most prominent symptoms of osteoarthritis. It is generally agreed that muscular weakening is the primary source of pain and impairment, while cartilage, which acts as a cushion between joints, wears away with time. [18] There is some evidence to support the use of yoga as an alternative therapy modality in the management of pain in patients who have KOA. [19] Yoga has been shown to have a favourable effect in pain relief in all of the studies that were included in this review.

Above studies suggest that yoga can improve walking pain effectively. SF-36, SF-12 and PQSI tools were used to assess the quality of life in patients of KOA. There is significant improvement found in

RCTs. But in few systematic review Kan, L. (2016) [1],showed that yoga might have positive effects in relieving pain and mobility on patients with KOA, but the effects on quality of life (QOL) are unclear. [20] Lauche, R.(2019) [9] meta-analysis indicate that yoga may be effective for improving pain, function, and stiffness in individuals but Due to the low methodological quality and potential risk of bias, only a weak recommendation can be made for the use of yoga in people with osteoarthritis of the knee. [21] There is a need of proper yoga module for KOA patients with different ages and should be validated by the authority, so that methodological process and intervention becomes more accurate.

Implication of Yogic practice

The use of yoga as a technique for treating osteoarthritis is something that can only be recommended in a limited capacity. Nevertheless, considering the relatively low risk that is associated with yoga interventions and the widespread appeal that they have, it is possible to recommend them to patients who have a preference for yoga interventions or for patients who do not adhere to other forms of physical activity. [22] Several types of yoga, including those that emphasize meditation and those that emphasize physical activity, were found to be effective, according to the studies that were included in the analysis. [12, 13]

Certain dynamic yoga styles that are currently popular, such as hot yoga, yin yoga, and power yoga, have not been subjected to formal evaluation, and it is possible that they are not appropriate for this particular group of people. The amount of yoga that was administered in each of the studies was significantly different from one another. It is essential to participate in physical activity on a minimum of three occasions per week in order to improve one's physical fitness and to reap the multitude of health benefits that come with different kinds of exercise [23]. Because there are not enough studies that specifically investigate the dose-response relationship, it has not been possible to determine the minimum dose and duration of yoga practice that is required.

In addition, there is a dearth of research that has been conducted on the topic of instructor attendance in yoga studies. It is of the utmost importance to recognize that the prominent yoga styles that have been discussed in the literature either place an emphasis on anatomical alignment or on slow and gentle movements. Those who suffer from osteoarthritis, particularly those who lead sedentary lifestyles or who are elderly and have other medical conditions, should pay particular attention to modifying their postures in order to accommodate their individual limitations and ensure their safety. [24]

Limitations

Within this comprehensive investigation, three potential constraints were identified. Initially, we would refrain from conducting quantitative research through a meta-analysis due to the diversity of the studies and the lack of data on some important outcomes. Another potential source of bias is the omission of studies conducted in languages other than English, as well as unpublished articles and conference proceedings. Furthermore, this review only incorporates a limited number of randomized controlled trials (RCTs) undertaken in this domain, which are of poorer quality. Consequently, the capacity to draw definitive conclusions from these studies is restricted.

Conclusion

According to this Systematic Review, there is strong evidence that yoga has a beneficial effect in reducing pain in people who suffer from knee osteoarthritis (KOA). Patients diagnosed with knee osteoarthritis (KOA) may benefit from yogic intervention over a period of twelve weeks, which may assist to enhance their muscle strength, flexibility, functional mobility, and quality of life (QOL). The findings of the study indicated that additional research may be conducted on elderly women who are afflicted with KOA due to the high prevalence rate.

Recommendations: researches have lack of validated protocol for people of different age groups suffering from KOA.

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