EFFECT OF YOGA THERAPY ON KNEE PAIN AMONG PATIENTS SUFFERING FROM OSTEOARTHRITIS

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Abstract: Purpose of presentresearch was to study the effect of Yoga Therapy on Knee pain among patients suffering from Osteoarthritis between age group of 40-60 years. Pre-test Post-test Single groupresearch design was used to achieve present objective. Non-Probability based Purposive Sampling Technique, was used to screen samples from Yoga therapy centres from Pune city, who were falling under the criteria of suffering knee pain, between 40-60years of age group both male and female samples. Total 80 samples were selected experiencingknee pain/stiffness and were willing to participate in study. The MPQ is composed of 78-word items, of which respondents choose those that best describe their experience of pain. Seven words are selected from the following categories: dimension 1 to 10 (pain descriptors), three words; dimensions 11 to 15 (affective components of pain), dimension 16 (evaluation of pain) one word, and dimension 17 to 20 (miscellaneous) one word. Scores are tabulated by summing values associated with each word; scores range from 0 (no pain) to 78 (severe pain). *12 weeks Yoga therapy was designed and implemented to all 80 osteoarthritis patients. After 12 weeks, McGrill Pain Questionnairewereagain administered to collect post-test data from 80 samples. Pre and post test scores were statistically analysed through Descriptive and Inferential statistics using SPSS software.* McGill Pain Questionnaire (MPQ)tool was administered on 80 Osteoarthritis patients age group between 40- 60years. Mean of their knee pain scores before intervention (pre-test) was 44.61 (±9.43) with 1.05SEM.Similarly, post 12 weeks Yoga therapy (post-test), for 80 knee osteoarthritis patients, mean of their knee pain scores was 14.80 (±5.38) with 0.60SEM. Compared the difference between pre-test and post-test knee pain scores paired sample t-test differences were calculatedvia SPSS software at 0.05 level of significance. Mean, Std. Deviation (SD) and Std. Error of Mean (SEM) of paired differences for knee pain scores were 29.81, 10.03 and 1.12 respectively.On comparing the paired differences, the calculated t-value is 26.59 for degree of freedom 79, which shows significant difference at 0.05 level of significance (p=0.001; p<0.05).According to statistical analysis,Yoga therapy is effective in knee pain management amongst patients suffering from osteoarthritis (knee). Yoga therapy treatment is proved to be good curative measure in Osteoarthritis of knee. Yoga therapy is a safe and supportable exercise for knee osteoarthritis patients.*

Key Words: Musculoskeletal Disorder, Osteoarthritis of knee, Therapeutic yogic practices, Types of Arthritis

Introduction: Globally, as of 2010, approximately 250 million people had osteoarthritis of the knee (3.6% of the population). Osteoarthritis (OA) majorly affects the old population which is a major cause of disability in older adults worldwide. According to World Health Organization (WHO) 9.6% of men and 18.0% of women aged over 60 years have symptomatic osteoarthritis worldwide. Osteoarthritis is 2nd most common rheumatologic disease. Osteoarthritis (OA) of both knees is the most frequently found in

developed as well as developingcountries such as India. In India it has prevalence of 22% to 39% which is the most common joint disease with 80% of those have limitations in movement, and 25% cannot perform their major daily activities of life.OA is more frequent in women than men. 45% of women age <65 years have symptoms while 70% of those over 65 years show radiological evidence of OA.

Osteoarthritis is a chronic, musculoskeletal disorder which characterized by steady loss of cartilage and reduced range of movements in joints. It results in bones rubbing each other and creates regular or frequent pain, stiffness, and impaired movements in joints. Arthritis mostly affects the joints in the knees, hips, hands, feet, and spine. This is associated with risk factors such as obesity, Sedentary lifestyle, lack of physical activity, genetic, decreased bone mineral density, occupational injury like farming, construction work etcand traumatic experiences like injury to collateral ligament, meniscal tears and joint fractures. Osteoarthritis can be classified into,primary osteoarthritis which is a chronic degenerative disease and is related to aging where the water content of the cartilages decreases on increasing age, thus making them more susceptible to degradation. However, secondary arthritis usually affects the joints earlier in life due to specific causes such asdiabetes, obesityand injury during a job which require frequent kneeling or squatting for prolonged hours. OA prevalence is increasing due to population ageing and increase in obesity& sedentary life style. Pain and loss of functional capacity increases due to this physical disability which is arising from decreased quality of life.The major symptoms of OA are pain, loss of functional ability, and "joint stiffness even after physical workout." These symptoms are regularly aggravated by rigorous exercise or physical activity and relieved during rest. Eventually this may reach to the point where the patient even feels pain during phase as well. Some patients even report pain so intense that it wakes them up while from sleep.Even this pain in Knee lead to reduced physical activity or sedentary lifestyle which may increase the weight gain and later obesity. Laterbeing overweight lead to the developing Diabetes, heart disease andblood pressure issues.Patients with OA have more chances of fall and fracture due to decreased function of joints, impaired balance and muscle weakness. Knee Pain is a personal, subjective experience influenced by cultural learning, the meaning of the situation, attention, and other psychological variables. Because of so many variables affecting it, pain measurement is an extremely difficult task. There is no one reading or measurement for holistic measurement of pain. Approaches to the measurement of pain include verbal and numeric self-rating scales, behavioural observation scales, and physiologic responses. One must also take into consideration the psychosocial aspects related to pain. Many a times though the initial stimulus producing pain is pathologic, the persistence or perception of pain which is out of proportion is mostly because of psychological reasons.An X-ray of affected joints, and MRI scan (Magnetic resonance imaging) shows the loss of the joint space, bone spurs or evidence of worn-down ends of the bones in the affected joint, and monitoring of progression

Pain Management of the patient with OA is comprehensive and individualized. Management plan should be regularly reviewed which is broadly divided into non-pharmacological, pharmacological, and surgical treatments. Non-pharmacological treatments such as education, exercise, weight reduction and physical aids (such as canes, insoles and knee braces)should be started first, followed by pharmacological treatment such as medicinal drugs like Paracetamol (Acetaminophen), Non-steroidal anti-inflammatory drugs (NSAIDs), Opioids, Intra-articular corticosteroids, Viscosupplementation and then Surgical Management such as Joint replacement surgery, Osteotomy surgery, and Arthroscopic debridement and lavage should be considered only if the first two are unsuccessful.As highly effective medicinal management is not

available emphasis should be given to preventive aspect of life style measures in the form of exercise, weight control, occupational and sports injury prevention, healthy diet etc. Prevention is a major strategy in addressing the disease burden of osteoarthritis; as no highly effective pharmaceutical treatments exist and surgical options are expensive and not widely available.

Yoga therapy is not only paramedical treatment but it is a lifestyle that deals effectively with physical problems such as Osteoarthritis. Beginning with the physical body, Yoga eventually influences all aspects of the person: vital, mental, emotional, intellectual and spiritual. It offers various levels and approaches to relax, energize, remodel and strengthen body and psyche which would ultimately reduce the knee pain. The specialised yoga therapy practicesincluded sukshma vyayamas (loosening practices) for foot and ankle, knee loosening, hip and waist loosening along withjanushakti vikasaka(strengthening practices) for knee joint like knee cap tightening, straight leg raising followed by relaxationtechniques like Om chanting, udgeet pranayama.

*Materials and Method:*Experimental Research Methodwas used to study the effect of 12 weeks Yoga Therapy programon knee pain amongOsteoarthritis patients age groupbetween 40- 60years.

*Participants***:** Target population was allmale and female patients suffering from orthopaedic problem mainly Knee Osteoarthritis between 40-60years of age group.Non-probability based Purposive Sampling Technique was used for sample selection. Sample of 80 patients wereselectedfor the present study. Pre experimental pre-test post-test single groupdesign was used.

*Variables& Tools:*12 weeks(6days/week) Yoga therapy was administered onto80Osteoarthritis patients from Pune city. It was for 6 days per week over a period of 12weeks. 1hour specialised knee strengthening therapeutic exercises were administered on experimental group only for 12 weeks.In this research Knee pain has been assessed through scores achieved inMcGill Pain Questionnaire (MPQ) developed by Dr Melzack at McGill University in Montreal Canada and hasbeen translated into several languages.

The McGill Pain Questionnaire (MPQ)is used to evaluate a person experiencing significantpain. The MPQ is composed of 78 items, of which respondents choose those that best describe their experience of pain. It can also be used to monitor the pain over time and to determine the effectiveness of anyintervention. Scores are tabulated by summing values associated with each word; scores range from 0 (no pain) to 78 (severe pain). Qualitative differences in pain may be reflected in respondent's word choice.

*Procedure:*To study the effect of 12 weeks Yoga Therapy on knee pain among patients suffering from knee osteoarthritis, age between 40-60 years, from Pune city present research follows the pre-test post-test experiment group research design. 80subjects were selected from yoga therapy centre who were having knee pain. Pre-test was administered, through McGill pain questionnaire for all 80 samples and data were collected. Before post-test,12 weeks yoga therapy treatment was given to all sample patients. Post-test was taken from 80 sampleson the last day of 12 weeks yoga therapy program and post test data was collected.The mean and standard deviation for experimental pre-test and post-test group along on dependent variable knee pain were analysed. Looking to the objective of the present investigation analysis of collected data was done by paired sample t – test in order to study the effect of Yoga therapy on knee pain among 80 osteoarthritis patients.

Results & Discussion: For 80 knee osteoarthritis patients, collected pre and postknee pain scores were statistically analysed by using descriptive, and inferential statistics using SPSS software.To Compare the difference between pre-test and post-test knee pain scores paired differences were calculated. Descriptive statistics (Mean, SD and SEM) of Pre-test, Post-test data for 80 samples were summarized as shown in below Table 1.1.

Table 1.1
Descriptive Statistics of Knee Pain scores for 80 knee osteoarthritis samples

	Pre-test	Post-test
Mean	44.61	14.80
Std. Error of Mean	1.05	0.60
Std. Deviation	9.43	5.38

McGill Pain Questionnaire (MPQ)tool was administered on 80 Osteoarthritis patients age group between 40- 60years. Mean of their knee pain scores before intervention (pre-test) was 44.61 ($\pm$9.43) with 1.05SEM.Similarly, post 12 weeks Yoga therapy (post-test), for 80 knee osteoarthritis patients, mean of their knee pain scores was 14.80 ($\pm$5.38) with 0.60SEM.

Compare the difference between pre-test and post-test knee pain scores paired sample t-test differences were calculatedvia SPSS software. Significance level was calculated at 0.05 level of significance.To test null hypothesis statistically by using paired sample t-test, inferential statistics were calculated as shown in below Table 1.2

Table 1.2
Inferential Statistics for Paired differences of knee pain scores for 80 osteoarthritis samples

Pretest -	Mean	SD	SEM	Lower	Upper	t	df	Sig. (2-tailed)
Posttest	29.81	10.03	1.12	27.58	32.04	26.59	79.00	0.001

From Table 1.2, compared the difference between pre-test and post-test knee pain scores for 80 osteoarthritis samples, paired differences were calculated.Mean, Std. Deviation (SD) and Std. Error of Mean (SEM) of paired differences for knee pain scores were 29.81, 10.03 and 1.12 respectively.On comparing the paired differences, the calculated t-value is 26.59 for degree of freedom 79, which shows significant difference at 0.05 level of significance ($p=0.001$; $p<0.05$).

Discussion: 12 weeks Yoga therapy proved significantly effectiveon reducing knee pain among 80 osteoarthritis samples in present study. A Systematic review showed that yoga might have positive effects in relieving pain and mobility on patients with Knee osteoarthritis according to Laide Kan, Jiaqi Zhang and Pu Wang (2016),Singh D. (2018) investigated the effect of integrated approach of yoga therapy (IAYT) intervention in individual with knee Osteoarthritis which also showed significant improvement in knee pain, which suggest improved muscular strength, flexibility, and functional Mobility.The beneficial properties of yoga intervention on Osteoarthritissubjects have been reviewed by Garfinkel et al. (2006), these authors studied effects of 10 weeks ofadministered yoga in a Randomised control trial on 25 subjects and showed significantreduction in knee pain,

tenderness and improved ROM. In another pilot study on 11 patients with OA knees, reduction in pain and disability was recorded (Van D. et al. 2005). Ranjita showed 28-45% reduction in pain and mobility post 1 week of intensiveintegrated yoga therapy for OA knees. Thecushioning between patelo-tibial joints-cartilage wears away and muscleweakness is a major cause of knee pain.Yoga have been proved to be a significantly effective in pain reliefin all included studies. Hence the present study proved modified yoga therapy seen effective in reducing knee painamongst osteoarthritis.

Conclusion: According to statistical analysis,Yoga therapy is effective in knee pain management amongst patients suffering from osteoarthritis (knee). Yoga therapy treatment is proved to be good curative measure in Osteoarthritis of knee.Yoga therapy is a safe and supportable exercise for knee osteoarthritis patients.

References:

Altman R., et al. (2001). Development of criteria for the classification and reporting of osteoarthritis. Classification of osteoarthritis of the knee. *Diagnosticand Therapeutic Criteria Committee of the American RheumatismAssociation. Arthritis Rheum.* 1986;29(8):1039–49.

Broota K. D. (2002). Experimental Design in Behavioral Research, *New Age International (P) Lit. Publisher.* New Delhi.

Deepeshwar S, Tanwar M, Kavuri V and Budhi RB (2018). Effect of Yoga Based Lifestyle Intervention on Patients with Knee Osteoarthritis: A Randomized Controlled Trial. Front. Psychiatry 9:180.

Fernandez E. (2001). Review of the McGill Pain Questionnaire. In B. S. Plake & J. C. Impara (Eds.). *The fourteenth mental measurements yearbook.* Lincoln, NE: Buros Institute of Mental Measurements. Pp. 735-737.

Ghasemi GA, Golkar A, Marandi SM (2013). Effects of hata yoga on kneeosteoarthritis. *Int J Prev Med.* 2013;4(Suppl 1):S133–8

J. Ebnezar, R. Nagarathna, B. Yogitha, and H. R. Nagendra,"Effects of an integrated approach of hatha yoga therapy onfunctional disability, pain, and flexibility in osteoarthritis ofthe knee joint: a randomized controlled study," *Journal ofAlternative and Complementary Medicine*, vol. 18, no. 5, pp. 463–472, 2012

Kishor Adhikari (2012). Study of effect of vipassana on anxiety and depression, *International Journal of Psychology and Behavioral Sciences,* 2(6): 274-276.

Krejci M., (2011). Yoga training application in overweight control of seniorswith arthritis/osteoarthritis. *Fizjoterapia.* 19(2):3–8

Kothari C.R. (2004). Research Methodology Methods and techniques Second revised edition, published by *New Age international (P) Ltd. Publisher.* Delhi.

Laide Kan, Jiaqi Zhang and Pu Wang (2016). The Effects of Yoga on Pain, Mobility, and Quality of Life in Patients with Knee Osteoarthritis: A Systematic Review. *Hindawi Publishing Corporation Evidence-Based Complementary and Alternative Medicine,* Volume 2016, Article ID 6016532, pg10-20.

Min-Ho Jung (2014). An evaluation of self-esteem and quality of life in orthodontic patients: Effects of crowding and protrusion, The Angle Orthodontist, December 2014. DOI: 10.2319/091814-662.1 · Source: PubMed.

Nagarathna R, Nagendra H, Ebnezar J, Yogitha B. (2012). Effect of integrated yoga therapy on pain, morning stiffness and anxiety in osteoarthritis of the knee joint: a randomized control study. *International Journal of Yoga,***5**:28–36.doi: 10.4103

Nambi G. S. and Shah A. K. (2013). Additional effect of iyengar yoga and EMG biofeedback on pain and functional disability in chronic unilateral knee osteoarthritis, *International Journal of Yoga*, vol. 6, no. 2, pp. 123–127.

Ranjita R, Nagarathna R. (2005). Effect of Yoga on Pain, Mobility, Gait, and Balancein patients with Osteoarthritis of the knee. International Journal of Yoga.

R. B. Saper, D. M. Eisenberg, R. B. Davis, L. Culpepper, & R.S. Phillips (2004). "Prevalence and patterns of adult yoga use in theUnited States: results of a national survey," *Alternative Therapiesin Health and Medicine, vol. 10, no. 2, pp. 44–49, 2004.*

Shaughnessy, John J., Zechmeister, Eugene B. (1994). Research Methods In psychology, 3rd edition. *McGraw-Hill International Editions*.

Srivastava S. N. Avasthi V. and S. Raj (2015). Does yoga improve pain, stiffness and physical disability in knee osteoarthritis?a randomize controlled clinical trial, *Osteoarthritis and Cartilage*, vol. 23, supplement 2, article A167.

Vandana Jain & Jyotsna Sharma (2017). Effect of Yogic Intervention: Pranayama on anxiety and depression, *The International Journal of Indian Psychology,* Volume 4, Issue 3, No. 99, PP- 124-136.