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Dr. Pavankmar Kohli
Professor, BKL Walawalkar
Rural Medical College, Sawarda,
Ta. Chiplun Dist. Ratnagiri,
Maharashtra, India

Dr. Poorv Patel
Secondary DNB Resident,
BKL Walawalkar Rural Medical
College, Sawarda, Ta. Chiplun
Dist. Ratnagiri, Maharashtra,
India

Dr. Hanumant Waybase
Arthroplasty Fellow BKL
Walawalkar Rural Medical
College, Sawarda, Ta. Chiplun
Dist. Ratnagiri, Maharashtra,
India

Dr. Satishchandra Gore
Professor, BKL Walawalkar
Rural Medical College, Sawarda,
Ta. Chiplun Dist. Ratnagiri,
Maharashtra, India

Dr. Sunil Nadkarni
Professor, BKL Walawalkar
Rural Medical College, Sawarda,
Ta. Chiplun Dist. Ratnagiri,
Maharashtra, India

Correspondence

Dr. Poorv Patel
Secondary DNB Resident,
BKL Walawalkar Rural Medical
College, Sawarda, Ta. Chiplun
Dist. Ratnagiri, Maharashtra,
India

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The value of cross legged sitting: Virtue or vice for health. A review from sports medicine, physiology and yoga. Implications in joint arthroplasty.

Dr. Pavankmar Kohli, Dr. Poorv Patel, Dr. Hanumant Waybase, Dr. Satishchandra Gore and Dr. Sunil Nadkarni

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Abstract

Background: Despite the large volume of knee replacements carried out the world over, three very pertinent questions regarding the basic act of sitting & its relevance to Knee Arthroplasty have not yet been given adequate thought.

Objectives: 1.) whether sitting cross legged is healthier than chair sitting, 2.) does sitting cross legged impact quality and longevity of life, 3.) Does it affect durability of the Arthroplasty implant whether total or partial knee Arthroplasty. This Pilot Analysis may lead to change in the habitual practice of doing total knee replacements without considering a more functional, less invasive & more cost friendly option.

Methods: This study was conducted in accordance with the MOOSE (meta-analysis of observational studies in epidemiology) and PRISMA (preferred reporting items for systematic reviews and Meta analyses) guidelines.

Results

1. Sitting cross legged is scientifically proven healthier way to sit compared to chair sitting on all counts...Body & Mind as reported by studies from Yoga, Sports medicine & human physiology. It increases fitness & enhances longevity of life too.
2. Only Unicondylar knee Arthroplasty gives the ability to sit cross legged (most Total knees are not allowed to sit cross legged for fear of exaggerated wear and those that are have a unacceptable percentage of spin offs or dislocation of polyethylene inserts)
3. In almost all lab studies, the mean wear rate of the medial & lateral bearings combined as a Total knee Replacement are significantly lower than a comparable fixed bearing as TKR under the same kinematic conditions. Unicondylar knees last longer too.

Conclusions: Sitting cross legged is an important function for health & longevity. It is culturally an unalienable part of Indian/Asian lifestyle. UKA provides these advantages and lasts longer in *In vitro* studies.

Keywords: UKA/UKR (unicondylar or partial knee replacement), TKA (total knee replacement), cross leg sitting, Sukhasana, arthroplasty, health, fitness, longevity

Introduction

Background

There has till date been no scientific evaluation of the health benefits of sitting cross legged from various sciences although it has been an ingrained part of the Indian / Asian cultures for Millenia. But is it healthier from evidence based medicine point of view?

The normal lifestyle of Asians, where sitting cross legged has passed down the generations as a cultural and healthier lifestyle. In fact in India & Japan, where the two foremost systems of meditations flourished i.e Yoga & Zen, it was found to have other advantages too like development of calm, steadiness & equanimity of mind. It is noteworthy that almost all the Gods of the east from early documented times, have been portrayed in the sitting cross legged or Sukhasana posture. These were meant to serve as role models for the large populations which understood pictorial characters more than words. Essence was in the sitting cross legged. Sitting cross legged promoted balance, proprioception, enhanced parasympathetic rest & digest response and led to a more integrated & calmer state of mind in asanas, work & during eating & prayer, the most essential acts of any human life [3, 4].

Thus, in a frequent condition of knee osteoarthritis, where arthroplasties are increasing by the day, the most major advantage of UKA over TKR i.e. of sitting cross legged... is sacrificed thoughtlessly. Total knee replacement sacrifices the normal lateral compartment and most importantly, the proprioceptive ligaments and framework of the intercondylar notch^[9, 10, 12].

We thought this particular question which is so important to the health, cultural & functional needs of the patient, needed specific redressal.

In addition, we also tried to address the question that does this sitting cross legged and UKA affect the life of the implant?

It would be safe to presume that an implant, which helped resumption of normal cultural lifestyle, adoption of a healthier life, lasted longer, increased the life span of the patients and had shorter hospital stay and less morbidity, was definitely the procedure & implant of choice!

Of course, about 25% of patients have very severe deformities, bilateral compartmental affection, this study is for the remaining 75% who have primarily medial compartment affection, with or without some patellofemoral arthritis & who are slated ad hoc for TKR, thereby giving them pain relief, but taking away function, longevity & fulfillment in the passing.

This question, we felt deserved sincere addressal.

To our knowledge, this is the first time that such a pilot review & Analysis study has been attempted.

Material & Methods

A detailed review was made for the advantages of cross legged sitting for health.

Studies considered were of how cross legged sitting impacted longevity, mental health and a fulfilling life from journals of Physiology, Yoga & Sports Medicine.

Another review was made for the *in vitro* mechanical lab tests regarding longevity of UKA vs TKR implants.

Finally, Studies were also reviewed on the the ease of recovery, lesser costs, lesser morbidity & earlier discharges from hospital in Biateral UKA vis a vis Bilateral TKA.

Satisfaction index post UKA was also considered.

This study was conducted in accordance with the MOOSE (meta-analysis of observational studies in epidemiology)^[21] and PRISMA (preferred reporting items for systematic reviews and Meta analyses) guidelines^[22].

Literature search and selection of studies

We conducted a systematic search of Medline, Embase, PubMed, Google Scholar, Cochrane Controlled Register of Trials (CENTRAL), and Clinical Trials. Gov., to identify relevant studies published in English between 1 January 1997 and 31 July 2019. Studies were initially selected on the basis of their title and abstract, we included randomised controlled trials, retrospective analyses of large national or multicentre databases or joint registries, and large cohort studies. The search was limited to studies that directly compared outcomes of UKA and TKA. Studies were excluded if the data presented were insufficient to pool for statistical analysis.

Data extraction

Data were extracted by use of standardised forms, such as the name of the lead investigator, year of publication, recruitment period, and median duration of follow-up, number of participants, and mean age and sex of the participants. Furthermore, the primary outcome measures and adverse event data were extracted.

A detailed pilot review was made for the advantages of cross legged sitting for health. Studies considered were of how cross legged sitting impacted longevity, mental health and a fulfilling life. Another review was made for the *in vitro* mechanical lab tests regarding longevity of UKA vs TKR implants. Finally, Studies were also reviewed on the ease of recovery, lesser costs, lesser morbidity & earlier discharges from hospital in bil UKA vis a vis Bil TKA. Satisfaction index post UKA was also considered.

Results

UKA is a superior alternative to TKR for a vast majority of patients. It enables a more active lifestyle, enables more function including cross legged sitting, both of which are enabling for longevity of life^[3, 4].

In UKA, Not only does the patient live longer, the implant also lasts longer. And all this while enabling a more health friendly lifestyle.

A study published in the European Journal of Preventive cardiology noted that participants who lacked the ability to rise from the floor without assistance were twice as likely to die than those who were able do so ("How Well", 2012). Maintaining the ability to sit and stand from the ground is valuable in long-term health and wellness, and this skill is not currently being cultivated by sitting arrangements^[1].

A similar study confirmed this sentiment, stating that musculoskeletal fitness indicators such as the Sit to Rise Test, i.e to stand up from sitting cross legged on floor, which examine individuals for muscle strength and flexibility, is a significant predictor of all-cause mortality (Chau J *et al.*, 2014)^[2].

Some reference is shown that research performed on floor-seated postures and their MET levels have been conducted by Hagins, Moore, & Rundle in 2007, wherein the researchers determined that while yoga alone cannot satisfy recommendations for the intensity of physical activity to maintain health and fitness, practicing yoga is akin to walking on a treadmill at 2 mph and expends around 2.5 METs^[3].

So, while it has been determined that sitting on the floor in traditional Eastern postures such as the yogic *Sukhasana* (easy, joyful pose,) expends more energy than sitting in a chair is more calming & integrated state for the mind by journals of Yoga & Human Physiology, it has also been proven by inclusion of the above test in the American Council of sports medicine that the action of rising frequently from the ground, not only is a predictor of lifespan, but increases longevity^[1, 2, 4].

The health benefits of yoga have been studied by hundreds of peer-reviewed scientific sources. One study published in the International Journal of Orthopaedics Sciences states that yogic meditation done in the sitting cross legged pose, is a promising way to improve cardio-metabolic health and, in a trial, found significant improvements in body-mass index, systolic and diastolic blood pressure, both LDL and HDL cholesterol levels, heart rate, weight, and triglyceride levels, which are all traditionally biometrics that indicate lifestyle disorders like obesity and CVD^[6].

Study published in the International Journal of Cardiology, which assessed "the effects of yoga & meditation done in Sitting cross legged pose, impact modifiable biological cardiovascular disease risk factors," found that yoga also improved biometrics like blood pressure, heart rate, respiratory rate, waist circumference, cholesterol, and triglyceride levels, revealing "evidence for clinically important effects of yoga on most biological cardiovascular

disease risk factors” [7].

The use of yoga for alleviation of chronic lower back pain (CLBP), one study in the American Journal of Lifestyle Medicine found that yoga in a sitting cross legged posture reduces functional disability and improves stress, depression, and pain responses in patients. The authors state that their study “suggests that yoga and meditation in Sukhasana has the ability to reverse the interlinked downward spiral, whereby CLBP causes depression, which gives rise to further back pain, resulting in increased depression, and so on.” This research indicates that potential health benefits of yoga extend beyond just the physical realm [8].

Discussion

Sitting cross legged has been an integral part of the Indian lifestyle since ancient times. It was adopted for studying, eating, praying & meditating or in short any activity that needed composure of mind & stability of body. Yoga has propounded the advantages of Sukhasana or sitting cross legged varying from stability of body needed for long duration tasks to self-realization & self-actualization [6, 26].

Yoga says that body is the visible Mind & Mind the invisible body. Both have an inextricable link & are interdependent on the other. The stabler the body, the quieter the mind. Newer studies have mentioned the positive impact on muscles for core stability & pelvi sacral frame for proper breathing, proper oxygenation & central & peripheral circulation [3, 26].

Even at its worst, the practice of sitting cross legged consumes more calories than chair sitting or couch sitting [4].

More recently, the practice of getting up from the cross legged position was included as one of the only two validated tests to predict life expectancy by the American college of sports medicine [5].

Other than walking up a flight of stairs, how long one will live, will depend on how easily he gets up from a floor cross legged sitting position. Thus sitting cross legged enhances integration of mind & body & getting up from sitting cross legged enhances longevity and balance & proprioception.

Of all the pills & medicine that modern science has invented, Exercise remains the king of impact and efficiency in results. (www.exerciseismedicine.org) (www.rciseismedicine.org)

Including exercise i.e sitting and getting up cross legged, into an activity that all of us need for long time in the day, No matter our nature of work, was the wise ancient way for inculcating healthier & more efficient habits into our way of life.

The only implant to allow sitting cross legged & getting up from the floor, both of which are shown to enhance lifespan & health is the UKA. Satisfaction, another important element has always ranked higher in UKA than TKR [17].

This is due to a more active lifestyle, a more normal lifestyle, and a feeling of normal knees Addition factors are ability to operate on more morbid patients, lessor invasive surgeries, quicker discharges, & still lessor medication & costs for the patient & healthcare system [15].

The consideration of the final factor was the longevity of the implant. Do we need to sacrifice on longevity to get so many health & lifespan benefits?

Fortunately No. *In vitro* studies have shown significantly lower wear rates under the same kinematic conditions of the same implant with the same polyethylene when inserted in the UKA mode vis a vis TKR mode [10] This may not directly translate into longer survival *in vivo* due to a more active lifestyle & sporting activities, but the fact remains that the implants inserted in the UKA mode do last longer than the

same polyethylene inserted in TKR mode [14].

It does not come as a surprise that some centers in Europe would rather do a bicompartamental UKA rather than a TKR with excellent results & satisfaction [7, 23, 24].

From the above it is clear, whatsoever promotes a nature friendly lifestyle, promotes more activity, including in sitting, walking sports etc., will not only make the joint last long, the patient will live longer & more fulfillingly [6, 7, 12].

Other advantages of UKA of long survivorship of upto 98% at 10 years, Lessor complications ¹¹Restoration of normal knee kinematics [11, 12, 13, 14]. Proprioception [14].

Nature respects those who respect nature. It is like most a reciprocal arrangement. Whether we want to give up function culture and time tested health practices, for sake of during a more common procedure remains our individual choice. But in all honesty, our patients must be made aware that a more durable, health friendly & less morbid surgery does exist for Indian /Asians patients.

Conclusion

1. Sitting cross legged is scientifically proven healthier way to sit compared to chair sitting on all 3 counts Body, Mind & Soul.
2. Only Unicondylar knee Arthroplasty gives the ability to sit cross legged. Satisfaction level and resumption of original lifestyle was a great satiety factor for Unicondylar knees above total knee replacements.
3. In almost all lab studies, the same polyethylene lasted MORE in the Unicondylar mode than in the Total knee Arthroplasty mode under all petterns of straim testing. The above are important factors for decision making in Indian patients. Patients appreciate complete resumption of original lifestyle, especially when it is healthier, costs lessor (due to shorter hospital stay etc.) and lasts longer.

References

1. Brito LBB de, Ricardo DR, Araujo DSMS de, Ramos PS, Myers J, Araujo CGS de. Ability to sit and rise from the floor as a predictor of all-cause mortality. *European Journal of Preventive Cardiology*. 2012-2014; 21(7):892-898.
2. Chau JY, Daley M, Dunn S, Srinivasan A, Bauman AE, Ploeg. The effectiveness of sit-stand workstations for changing office workers' sitting time: results from the randomized controlled trial pilot. *International Journal of Behavioral Nutrition and Physical Activity*. 2014; 11(1):127-132.
3. Hagins M, Moore W, Rundle A. Does practicing hatha yoga satisfy recommendations for intensity of physical activity which improves and maintains health and cardiovascular fitness? *BMC Complementary and Alternative Medicine*. 2007; 7(1):40-44.
4. <https://www.mindbodygreen.com/0-5812/4-simple-yet-powerful-ayurvedic-tips.html>.
5. <https://blog.udemy.com/asian-squats/>
6. Kohli PK, Chavan S, Nawale A, Hardikar S, Nadkarni S. A nature friendly knee arthroplasty for prayer and meditation in Asiatic lifestyle. *International Journal of Orthopaedics Sciences*. 2018; 4(4):719-723.
7. Cramer H, Lauche R, Haller H, Steckhan N, Michalsen A, Dobos G. Effects of yoga on cardiovascular disease risk factors: a systematic review and meta-analysis. *Int J Cardiol*. 2014; 173(2):170-83.
8. Diaz AM, Patel CK, Pabian PS, Rothschild CE, Hanney JW. The Efficacy of Yoga as an Intervention for Chronic

- Low Back Pain: A Systematic Review of Randomized Controlled Trials. *Asian journal of lifestyle medicine*. 2013; 7(6):418-430.
9. Squire MW, Callaghan JJ. Unicompartmental knee replacements, a minimum 15 year follow up study. *CORR*. 1999; 367:61-72.
 10. Patil S, Colewell C. Can normal knee kinematics be restored with UKA JBJS., 2005; 87:332-338.
 11. Brockett CM, Jennings LM, Fisher J. The wear of fixed and mobile bearing unicompartmental knee replacements J, *Engineering in Medicine*. 2010; 225(Part H):511-518.
 12. Laurencin CT, Zelicof SB, Scott RD, Ewald FC. Unicompartmental Versus Total Knee Arthroplasty In The Same Patient. A Comparative Study. *Clinorthoprelat Res*. 1991; 273:151-156.
 13. Yang KY, Wang MC, Yeo SJ, Lo NN. Minimally Invasive Unicondylar Versus Total Condylar Knee Arthroplasty-Early Results of A Matched-Pair Comparison. *Singapore Med J*. 2003; 44:559-562.
 14. Hassaballa MA, Porteous AJ, Newman JH. Observed Kneeling Ability after total, Unicompartmental and Patellofemoral Knee Arthroplasty: Perception Versus Reality. *Knee Surg Sports Traumatolarthrosc*. 2004; 12:136-139.
 15. Lombardi AV Jr, Berend KR, Walter CA, Aziz-Jacobo J, Cheney NA. Is Recover Faster For Mobile-Bearing Unicompartmental Than Total Knee Arthroplasty? *Clinorthoprelat Res*. 2009; 467:1450-1457.
 16. Hopper GP, Leach WJ. Participation in sporting activities following knee Replacement: total versus Unicompartmental. *Knee Surg Sports traumatolarthrosc*. 2008; 16:973-979.
 17. Von Keudell A, Sodha S, Collins J *et al*. Patient Satisfaction after Primary total and Unicompartmental Knee Arthroplasty: An Age Dependent Analysis. *Knee*. 2014; 21:180-184.
 18. Ahlbäck S. Osteoarthritis of the Knee. A Radiographic investigation. *Acta Radiol Diagn (Stockh)*. 1968; (Suppl) 277:7-72, 2.
 19. Chatterji U, Ashworth MJ, Lewis PI, Dobson PJ. Effect of total Knee Arthroplasty on Recreational and Sporting Activity. *Anz J Surg*. 2005; 75(6):405-8.
 20. Walton NP, Jahromi I, Lewis PI, Dobson PJ, Angel KR, Campbell DG. Patient Perceived Outcomes and Return to Sport and Work: TKA versus Mini-Incision Unicompartmental Knee Arthroplasty. *J Knee Surg*. 2006; 19(2):112-6.
 21. Stroup DF, Berlin JA, Morton SC *et al*. Meta-analysis of observational studies in epidemiology: A proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group. *JAMA*. 2000; 283:2008-12. DOI:10.1001/jama.283.15.2008
 22. Hutton B, Wolfe D, Moher D, Shamseer L. Reporting guidance considerations from a statistical perspective: overview of tools to enhance the rigour of reporting of randomised trials and systematic reviews. *Evid Based Ment Health*. 2017; 20:46-52.
 23. Luigo Sabatini, Matteo Giachino, review article primary total knee arthroplasty, *Annals of Translational medicine*. 2016, 4(5):1.
 24. Kamath AF, Levack AJ. *Journal of Arthroplasty* Jan. 2014; 29(1):75-9.
 25. Han HS, Kang SB. High incidence of loosening of femoral component in Legacy Posterior stabilised Flex, Total knee Replacement, *The Bone & Joint Journal* Nov. 2007; 89B:11.
 26. Catherine Woodyard. Exploring the therapeutic effect of Yoga & its ability to increase quality of life *International journal of Yoga*. 2011; 4(2):2, 49-54.