International Journal of Multidisciplinary Research and Development
www.allsubjectjournal.com
ISSN Online: 2349-4182
Received: 21-04-2026, Accepted: 22-05-2026, Published: 06-06-2026
Volume 13, Issue 2, 2026, Page No. 478-481

# To study the prevalence and symptoms of knee osteoarthritis among rice farmers in Palghar District

**Akshata Dabhade[1], Dr. Mahima Gaikwad[2], Dr. Neha Panchal[2]**
[1] Department of Physiotherapy, YMT College of Physiotherapy, Kharghar, Navi Mumbai, Maharashtra, India
[2] Assistant Professor, YMT College of Physiotherapy, Kharghar, Navi Mumbai, Maharashtra, India
**DOI:** https://doi.org/10.66856/ijmrd.2026.13.2.13298

**Abstract**
**Background:** Knee osteoarthritis is a chronic degenerative musculoskeletal disorder that affects millions of individuals worldwide and is a major contributor to pain, disability, and reduced quality of life. Occupations involving repetitive knee loading, prolonged squatting, kneeling, bending, and lifting are associated with a higher risk of developing osteoarthritis. Rice farming is one such occupation where workers are continuously exposed to physically demanding activities that place excessive stress on the knee joints.
**Objective:** To determine the prevalence and symptom profile of knee osteoarthritis among rice farmers in Palghar District using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).
**Methods:** A cross-sectional observational study was conducted among 164 rice farmers aged between 45 and 60 years. Participants with at least one year of rice farming experience were included. Individuals with a history of knee replacement surgery, spinal surgery, or major knee deformities were excluded. The WOMAC questionnaire was administered to assess pain, stiffness, and physical function. Data were analyzed using descriptive statistical methods.
**Results:** The findings demonstrated that 60% of participants had moderate osteoarthritis, while 40% exhibited severe osteoarthritis. Pain during stair climbing and pain at rest were among the most frequently reported symptoms. Morning stiffness was common among participants, and substantial functional limitations were observed during sitting, lying down, and performing household activities.
**Conclusion:** A high prevalence of knee osteoarthritis was observed among rice farmers in Palghar District. The disease significantly affected pain levels, joint stiffness, and functional performance. Occupational activities associated with rice cultivation may contribute considerably to disease development. Early identification, ergonomic modifications, physiotherapy interventions, and community awareness programs are essential for reducing disability and improving quality of life.

**Keywords:** Knee osteoarthritis, rice farmers, WOMAC, musculoskeletal disorders, occupational health, functional limitation, prevalence

## Introduction

Osteoarthritis is a progressive degenerative disease of synovial joints and represents one of the leading causes of chronic pain and disability worldwide. The condition is characterized by gradual deterioration of articular cartilage, remodeling of subchondral bone, formation of osteophytes, and varying degrees of synovial inflammation. These structural changes eventually result in pain, stiffness, restricted mobility, and impaired physical function. As life expectancy increases and populations continue to age, osteoarthritis has emerged as a major public health concern affecting both developed and developing countries.

Among the different joints affected by osteoarthritis, the knee joint is most frequently involved due to its significant role in weight-bearing and locomotion. Knee osteoarthritis can substantially interfere with an individual's ability to perform routine activities such as walking, climbing stairs, squatting, standing from a seated position, and carrying out occupational tasks. Consequently, the condition has profound physical, psychological, and socioeconomic implications.

The etiology of knee osteoarthritis is multifactorial. Several biological and mechanical factors contribute to its development, including age, obesity, genetic predisposition, previous joint trauma, muscle weakness, and repetitive joint loading. Among these factors, occupational exposure has gained increasing attention because certain occupations require repetitive movements and sustained postures that increase mechanical stress on the knee joint over prolonged periods.

Agricultural work is recognized as one of the most physically demanding occupations globally. Farmers routinely engage in activities involving repetitive bending, squatting, kneeling, lifting, carrying, and prolonged standing. Continuous exposure to these biomechanical stresses can accelerate degenerative changes within the knee joint. As a result, agricultural workers are often reported to have a greater prevalence of musculoskeletal disorders compared with the general population.

Rice farming is particularly labor-intensive and requires workers to perform tasks under challenging environmental and physical conditions. During transplantation and harvesting, farmers frequently maintain prolonged squatting and kneeling postures. Additional activities such as carrying agricultural loads, walking through uneven terrain, and repetitive bending further increase the stress placed on the lower extremity joints. Over time, these occupational demands may contribute to cartilage degeneration, altered joint mechanics, and the development of symptomatic knee osteoarthritis.

Several international studies have demonstrated a strong association between farming occupations and knee

osteoarthritis. Research conducted among Korean and Thai agricultural workers has reported that prolonged squatting, repetitive kneeling, and heavy lifting are significant occupational risk factors for knee pain and osteoarthritis. Similar findings have been reported in European farming populations, where chronic exposure to physically demanding work activities was associated with increased rates of degenerative joint disease.

In India, agriculture continues to be a primary source of employment and livelihood for a large segment of the population. Rice cultivation remains one of the most important agricultural practices in many regions, including Maharashtra. Despite the substantial number of individuals engaged in rice farming, relatively few studies have focused specifically on the prevalence and symptom characteristics of knee osteoarthritis within this occupational group. Consequently, there is limited evidence regarding the burden of disease among rice farmers and the extent to which occupational activities influence symptom severity and functional limitations.

Palghar District is predominantly rural and agricultural in nature, with rice farming serving as a major economic activity. Farmers in this region are exposed to repetitive physical tasks throughout the cultivation cycle, potentially increasing their susceptibility to musculoskeletal disorders. Understanding the prevalence of knee osteoarthritis and the associated symptom profile in this population is important for planning preventive strategies, rehabilitation programs, and occupational health interventions.

The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) is a widely accepted and validated outcome measure used to assess pain, stiffness, and physical function in individuals with osteoarthritis. It provides valuable information regarding symptom severity and functional status and has been extensively utilized in clinical and research settings. Therefore, the present study employed the WOMAC questionnaire to evaluate the prevalence and symptom characteristics of knee osteoarthritis among rice farmers residing in Palghar District.

## Materials and Methods

### Study Design

A cross-sectional observational study was undertaken to investigate the prevalence and symptoms of knee osteoarthritis among rice farmers residing in Palghar District, Maharashtra. The study was conducted after obtaining approval from the Institutional Ethics Committee of YMT College of Physiotherapy.

### Study Setting

The study was carried out in selected rural areas of Palghar District where rice cultivation is the primary agricultural occupation.

### Study Population

Rice farmers actively involved in farming activities were recruited for the study. Participants were selected using a convenient sampling method.

### Sample Size

A total of 164 rice farmers participated in the study.

Inclusion Criteria

- Rice farmers aged between 45 and 60 years.
- Individuals with a minimum of one year of farming experience.
- Male and female participants willing to participate in the study.
- Exclusion Criteria
- Pregnant women.
- Individuals with a history of knee replacement surgery.
- Participants with previous spinal surgery.
- Individuals with congenital or acquired knee deformities.

### Outcome Measure

The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) was utilized as the primary assessment tool. The WOMAC questionnaire is a validated instrument that evaluates three important domains associated with osteoarthritis:

1. Pain (5 items)
2. Stiffness (2 items)
3. Physical Function (17 items)

### Data Collection Procedure

Participants fulfilling the eligibility criteria were informed about the purpose and procedure of the study. Written informed consent was obtained before data collection. The WOMAC questionnaire was administered individually, and participants were guided whenever clarification was required. All collected information was kept confidential.

### Statistical Analysis

The collected data were entered into Microsoft Excel for analysis. Descriptive statistical methods including frequencies, percentages, mean values, and standard deviations were used to summarize the findings. Results were presented using tables and graphical representations.

## Results

A total of 164 rice farmers participated in the study. Analysis of WOMAC scores revealed a substantial prevalence of knee osteoarthritis among the participants.

### Prevalence of Osteoarthritis

Out of 164 participants, 99 individuals (60%) were categorized as having moderate osteoarthritis, while 65 individuals (40%) demonstrated severe osteoarthritis. No participant was classified as asymptomatic or mildly affected.

### Pain Symptoms

Pain was one of the most prominent complaints reported by the participants. Nearly half of the participants experienced significant pain while climbing stairs. Pain at rest and pain during walking were also frequently reported. These findings indicate that osteoarthritis symptoms affected both active and resting states.

### Stiffness Symptoms

Morning stiffness was reported by a majority of participants and represented one of the most common symptoms observed. Many participants also experienced stiffness later in the day, suggesting persistent joint involvement and reduced mobility.

### Functional Limitations

Knee osteoarthritis significantly affected daily activities. Difficulties were commonly reported during sitting, lying in bed, standing, performing domestic work, shopping, and climbing stairs. The findings indicate that the condition interfered with both occupational performance and activities of daily living.

## Discussion

The present study was conducted to determine the prevalence and symptoms of knee osteoarthritis among rice farmers in Palghar District. The results demonstrated a considerable burden of osteoarthritis, with all participants presenting either moderate or severe disease severity according to WOMAC scores.

The high prevalence observed in this study may be attributed to the physically demanding nature of rice farming. Activities such as prolonged squatting, kneeling, repetitive bending, lifting heavy loads, and prolonged standing expose the knee joint to excessive mechanical stress. Repeated loading over several years may accelerate degenerative changes within the joint structures, thereby increasing the risk of osteoarthritis.

The findings of the present study are consistent with previous research conducted among farming populations. Holmberg and colleagues reported that farmers exhibit a significantly higher risk of knee osteoarthritis compared with non-farming populations due to occupational exposure to repetitive knee loading. Similarly, Song *et al*. identified squatting posture and manual material handling as important occupational risk factors among Korean farmers.

Pain was identified as a major symptom among study participants. Stair climbing emerged as one of the activities associated with the highest pain severity. This observation may be explained by increased compressive forces across the patellofemoral and tibiofemoral joints during stair negotiation. Pain during rest further indicates the presence of advanced degenerative changes and chronic inflammatory processes within the joint.

Morning stiffness was another commonly reported symptom. Stiffness is often associated with cartilage degeneration, synovial changes, and reduced joint lubrication following periods of inactivity. Persistent stiffness can negatively affect mobility and contribute to functional limitations throughout the day.

Functional impairments observed in the present study affected both occupational and domestic activities. Difficulty in sitting, standing, bending, and performing household tasks highlights the substantial impact of knee osteoarthritis on quality of life. Reduced functional independence may also affect work productivity and economic stability among agricultural workers.

The findings emphasize the importance of implementing preventive strategies within farming communities. Physiotherapy interventions focusing on strengthening exercises, flexibility training, balance exercises, and functional rehabilitation may help reduce symptoms and improve physical performance. Additionally, ergonomic modifications and education regarding joint protection techniques may assist in minimizing excessive stress on the knee joint.

## Clinical Implications

- Early screening programs should be introduced for agricultural workers.
- Community-based physiotherapy services can improve symptom management.
- Strengthening and flexibility exercises may enhance functional capacity.
- Ergonomic modifications during farming activities may reduce joint loading.
- Awareness campaigns can promote early diagnosis and timely treatment.

## Limitations

- The study was limited to rice farmers from Palghar District.
- Radiological confirmation of osteoarthritis was not performed.
- Convenience sampling may limit the generalizability of findings.
- The cross-sectional design prevented assessment of disease progression over time.

## Recommendations

- Longitudinal studies should be conducted to evaluate disease progression.
- Future research should include radiographic assessment.
- Larger multicentric studies involving different agricultural populations are recommended.
- Intervention studies evaluating physiotherapy and ergonomic programs should be undertaken.

## Conclusion

The present study investigated the prevalence and symptom characteristics of knee osteoarthritis among rice farmers in Palghar District. The findings revealed a substantial burden of osteoarthritis within the study population, with the majority of participants demonstrating moderate disease severity and a considerable proportion exhibiting severe osteoarthritis. Pain, stiffness, and functional limitations were frequently reported and significantly affected the participants' daily activities and occupational performance.

The physically demanding nature of rice farming, which involves prolonged squatting, kneeling, repetitive bending, lifting of heavy loads, and extended periods of standing, may contribute to increased mechanical stress on the knee joint and accelerate degenerative changes. These occupational exposures appear to play an important role in the development and progression of knee osteoarthritis among agricultural workers.

The study highlights the need for early identification and management of knee osteoarthritis in farming communities. Implementation of preventive measures, ergonomic modifications, regular screening programs, physiotherapy interventions, and health education initiatives may help reduce the burden of disease and improve functional independence. Strengthening exercises, flexibility training, and joint protection strategies should be encouraged to minimize disability and enhance quality of life among rice farmers.

## Acknowledgement

The authors express their sincere gratitude to YMT College of Physiotherapy, Kharghar, Navi Mumbai, for providing the necessary guidance, support, and facilities for conducting this research. The authors also extend heartfelt thanks to all the rice farmers of Palghar District who willingly participated in the study and contributed valuable information. Special appreciation is extended to the faculty members and research guide for their continuous encouragement and assistance throughout the research process.

**Conflict of Interest**
The authors declare that there is no conflict of interest related to this study.

**Source of Funding**
The study was self-funded. No external financial assistance was received for conducting this research.

**Ethical Clearance**
Ethical approval for the study was obtained from the Institutional Ethics Committee of YMT College of Physiotherapy prior to commencement of data collection. Written informed consent was obtained from all participants before their inclusion in the study.

**References**
1. Radha MS, Gangadhar MR. Prevalence of knee osteoarthritis patients in Mysore city, Karnataka. Int J Recent Sci Res,2015:6(4):3316-3320.
2. Holmberg S, Thelin A, Thelin N. Is there an increased risk of knee osteoarthritis among farmers? A population-based case-control study. Int Arch Occup Environ Health,2004:77(5):345-350.
3. Mattioli S, Graziosi F, Curti S, Bonfiglioli R, Argentino A, Violante FS, e*t al*. Knee osteoarthritis in a chestnut farmer: Case report. Ann Agric Environ Med,2017:24(1):144-146.
4. Ganvir SD, Zambare BR. Prevalence and identification of risk factors for knee osteoarthritis among elderly men and women. Sch J App Med Sci,2013:1(6):700-703.
5. Webber EJ, Tran T, June R, Healy E, Andrews TM, Younkin R, *et al*. WOMAC score and arthritis diagnosis predict decreased agricultural productivity. BMC Musculoskelet Disord,2021:22:1-12.
6. Nikolic G, Nedeljkovic B, Trajkovic G, Rasic D, Mirkovic Z, Pajovic S, *et al*. Pain, physical function, radiographic features, and quality of life in knee osteoarthritis agricultural workers living in rural populations. Pain Res Manag,2019:2019:7684762.
7. Song HS, Kim DH, Lee GC, Kim KY, Ryu SY, Lee CG. e*t al*. Work-related factors associated with knee osteoarthritis among farmers: A cross-sectional study. Ann Occup Environ Med,2020:32:1-10.
8. Peungsuwan P, Chatchawan U, Puntumetakul R, Yamauchi J. The prevalence and occupational factors associated with knee pain among older farmers. J Phys Ther Sci,2019:31(6):466-469.
9. Taylor-Gjevre RM, Trask C, King N, Koehncke N. Arthritis prevalence and occupational impact among farmers. J Agromedicine,2015:20(2):205-216.
10. Akinpelu AO, Alonge TO, Adekanla BA, Odole AC. Prevalence and pattern of symptomatic knee osteoarthritis in a community population. Internet J Allied Health Sci Pract,2009:7(3):1-10.
11. Das AK, Routray D, Panigrahi TK. Prevalence and associated factors of knee osteoarthritis in a rural population. J Fam Med Prim Care,2018:7(2):321-326.
12. Ajit NE, Nandish B, Fernandes RJ, Roga G, Kasthuri A, Shanbhag DN, *et al*. Prevalence of knee osteoarthritis in rural communities. Internet J Rheumatol Clin Immunol,2013:1(S1):1-8.
13. Fransen M, McConnell S, Harmer AR, Van der Esch M, Simic M, Bennell KL, e*t al*. Exercise for osteoarthritis of the knee: A systematic review. Br J Sports Med,2015:49(24):1554-1557.
14. Van der Esch M, Heijmans M, Dekker J. Factors associated with mobility limitations in osteoarthritis. Arthritis Care Res,2003:49(6):838-842.
15. Sancheti P, Shetty VD, Dhillon MS, Sprague SA, Bhandari M. Evaluation of knee osteoarthritis management in India: A multicentre study. Clin Orthop Surg,2017:9(3):286-294.
16. Patil SA, Kadam YR, Mane AS, Gore AD, Dhumale GB. Prevalence and impact of musculoskeletal disorders among farmers. Med J DY Patil Univ,2018:11(6):485-491.