# PREVALENCE OF OSTEOARTHRITIS AMONG POSTMENOPAUSAL WOMEN IN MAHARASHTRA: A CROSS-SECTIONAL STUDY

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**ABSTRACT**

**Background:**

Osteoarthritis (OA) is a leading cause of pain and disability among postmenopausal women, with hormonal decline, aging, lifestyle, and nutritional factors contributing to its high prevalence. In Maharashtra, cultural practices such as squatting, floor sitting, and high parity may further increase OA risk. However, region-specific prevalence data remain limited.

**Aim:**

To determine the prevalence of osteoarthritis among postmenopausal women in Maharashtra and examine associated demographic, lifestyle, and clinical risk factors.

**Methodology:**

A cross-sectional study was conducted among 300 postmenopausal women aged ≥45 years. Data on demographics, menopausal history, lifestyle factors, and clinical characteristics were collected through structured interviews. OA diagnosis and grading were determined using clinical assessment and Kellgren–Lawrence criteria. Descriptive statistics and chi-square tests were used to analyze associations between risk factors and OA prevalence.

**Results:**

The overall prevalence of osteoarthritis was 58% (n = 174). Knee OA was the most common type (50.7%), followed by hip OA (6%) and hand OA (1.3%). Bilateral knee involvement (59.2%) was more prevalent than unilateral involvement. Grade II OA was the most

frequent severity level (43.7%). Significant risk factors associated with OA included age >55 years (p < 0.001), obesity (p = 0.002), low physical activity (p < 0.001), regular squatting/kneeling (p < 0.001) and multiparity (p < 0.001).

**Conclusion:**

Osteoarthritis is highly prevalent among postmenopausal women in Maharashtra, influenced by biological, lifestyle, and cultural factors. Early screening, weight management, physical activity promotion are essential for prevention and management. Physiotherapists play a crucial role in delivering early interventions and improving functional outcomes.

## INTRODUCTION:

Osteoarthritis (OA) is a progressive degenerative joint disease and represents one of the leading causes of disability among older adults worldwide. It is characterized by the deterioration of articular cartilage, subchondral bone sclerosis, synovial inflammation, and osteophyte formation, ultimately resulting in chronic pain, stiffness, functional limitations, and reduced quality of life (1,2). With an aging global population, the prevalence of OA has increased substantially, affecting more than 528 million individuals globally, and is expected to rise further in the coming decades (3).

Women, particularly those in the postmenopausal stage, are disproportionately affected by OA. Multiple epidemiological studies reveal a sharp increase in OA prevalence after menopause, indicating the influence of biological and hormonal factors on joint health (4,5). Estrogen plays an important role in maintaining cartilage homeostasis, regulating chondrocyte metabolism, inhibiting inflammatory cytokines, and preserving bone density. The decline in estrogen levels during the postmenopausal period

contributes to accelerated cartilage degradation, increased bone turnover, and heightened inflammatory processes within the joint, increasing susceptibility to OA (6–8). As a result, postmenopausal women have a significantly higher likelihood of developing knee, hip, and hand OA compared to age-matched men.

In India, OA is a rapidly growing public health concern. Recent estimates suggest that nearly 22–39% of the adult population suffers from OA, making it one of the most prevalent chronic conditions in the country (9). Among women above the age of 50 years, the prevalence appears to be even higher, ranging between 45–60%, influenced by aging, obesity, lower physical activity levels, cultural practices, and limited access to preventive care (10,11). Occupational and lifestyle factors play a significant role, particularly among Indian women, who are often engaged in household activities involving repetitive

strain on lower extremity joints.

In Maharashtra, diverse social, occupational, and lifestyle patterns create unique risk factors for OA. Many women, even in urban areas, habitually sit cross-legged or squat during daily activities, perform household chores requiring repetitive kneeling, and climb stairs frequently due to architectural designs of traditional homes **(12)**. These practices impose increased mechanical load on knee and hip joints, potentially accelerating degenerative changes. Additionally, common issues such as multiparity, obesity, vitamin D deficiency, inadequate calcium intake, and sedentary lifestyle further heighten OA risk (13–15). Rural and semi-urban women may experience early menopause, lack awareness regarding musculoskeletal health, and have reduced access to orthopedic and physiotherapy services, exacerbating the burden.

Despite these risk factors, there is limited region-specific epidemiological data on OA prevalence among postmenopausal women in Maharashtra. Most existing studies focus on OA in the general adult population or on specific sites such as knee OA, neglecting broader demographic and lifestyle influences unique to postmenopausal women. Having accurate prevalence data is crucial for early identification, preventive strategies, and resource planning.

Understanding OA prevalence in this demographic is essential for several reasons. First, early detection enables physiotherapists and clinicians to initiate timely interventions that can reduce disability, improve mobility, and enhance overall quality of life (16). Second, region-specific evidence supports the creation of targeted community-based rehabilitation programs. Third, identifying modifiable risk factors such as obesity, physical inactivity, and mechanical joint loading can guide public health efforts focused on prevention and lifestyle modification.

Therefore, the present cross-sectional study aims to determine the prevalence of osteoarthritis among postmenopausal women in Maharashtra and examine associated demographic, clinical, and lifestyle-related risk factors contributing to OA in this vulnerable population.

## METHODOLOGY:

- **Study Design**

  A community-based cross-sectional observational study.

- **Study Area**

  The study was conducted in the Orthopaedic Outpatient Department (OPD) of a Government Hospital in Maharashtra include both urban and rural areas.

- **Study Population**

  Postmenopausal women

aged 45–75 years.

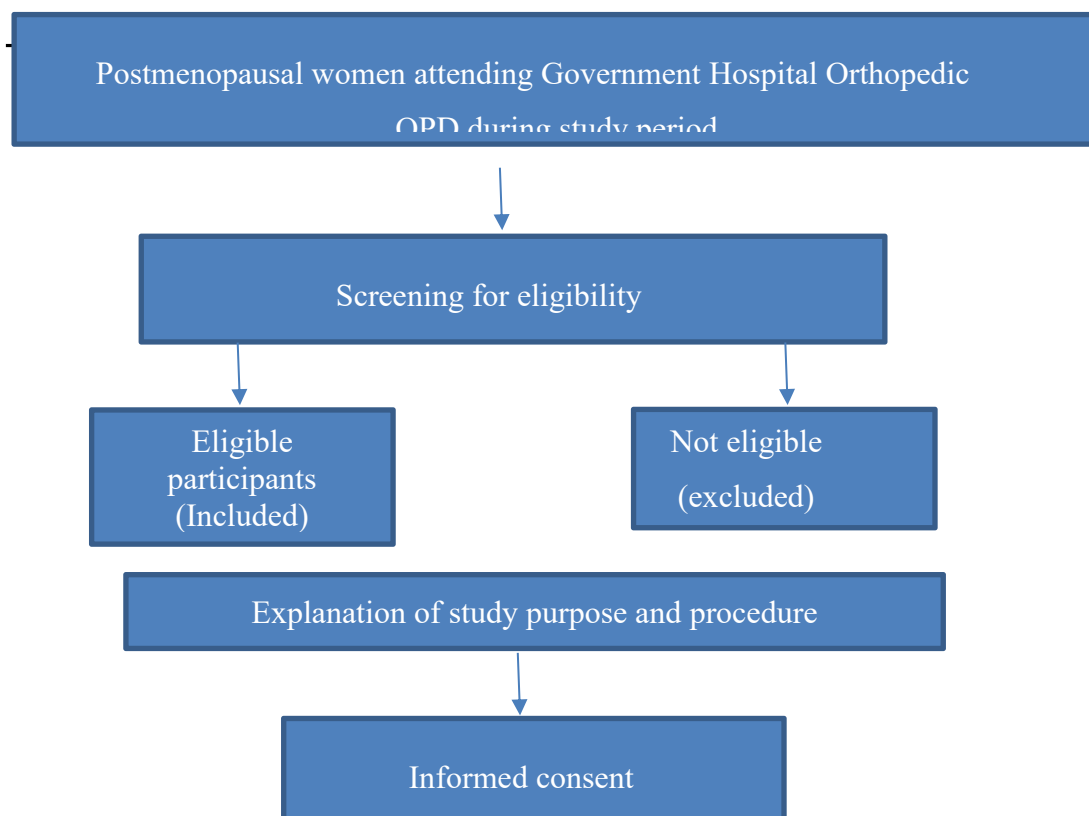- **Sampling**

  Convenience sampling

- **Sample Size**

  300 participants.

## Inclusion Criteria

- Natural menopause (≥12 months of amenorrhea)
- Postmenopausal women attending the Orthopaedic OPD of the Government Hospital

and willing to participate were included in the study."

- Willing to provide informed consent

## Exclusion Criteria

- Inflammatory arthritis (RA, gout)
- Severe cognitive impairment
- Known history of major lower-limb surgery
- Current hormone replacement therapy

**DATA collection flowchart**

```
Data collection initiated

(Interview, clinical assessment,
```

```
Sample size achieved
```
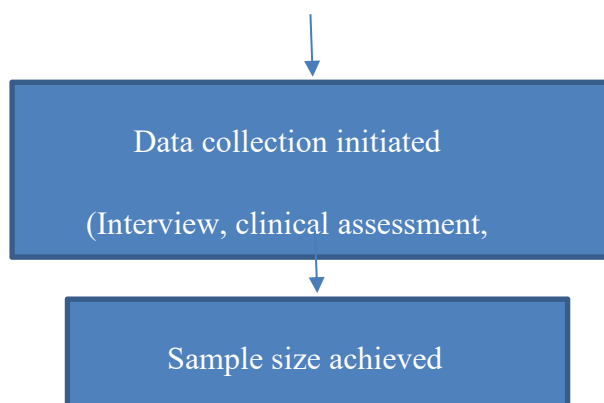
## STATISTICAL ANALYSIS

## Table 1. Demographic Characteristics of Postmenopausal Women

| ariable | ategory | equency (n) | rcentage (%) |
|---|---|---|---|
| e (years) | –50 | | .7 |
| | –55 | | .7 |
| | –60 | | .7 |
| | 0 | | .0 |
| esidence | ban | 2 | .0 |
| | ral | 8 | .0 |
| lucational Status | formal schooling | | .0 |
| | mary | 2 | .3 |
| | condary | | .3 |
| | gher secondary & above | | |

| arital Status | arried | 2 | .0 |
|---|---|---|---|
| | idowed | | .0 |
| MI Category | ormal (<25 kg/m²) | | .0 |
| | erweight (25– 29.9 kg/m²) | 2 | .3 |
| | ese (≥30 kg/m²) | 0 | .7 |
| e at Menopause | 5 years | 6 | .3 |
| | –50 years | 8 | .3 |
| | 0 years | | .3 |
| ysical    Activity Level | w | 8 | .3 |
| | oderate | | .7 |
| | gh | | .0 |

**Table 2. Prevalence of Osteoarthritis among Postmenopausal Women**

| Variable | Category | n | % |
|---|---|---|---|
| **Overall      OA prevalence** | Present | 174 | 58.0 |
| | Absent | 126 | 42.0 |
| **Type of OA** | Knee OA | 152 | 50.7 |
| | Hip OA | 18 | 6.0 |
| | Hand OA | 4 | 1.3 |
| **Side  Involvement (Knee OA)** | Unilateral | 62 | 40.8 |

| | Bilateral | 90 | 59.2 |
|---|---|---|---|
| **Severity (Kellgren–Lawrence Grade)** | Grade I | 42 | 24.1 |
| | Grade II | 76 | 43.7 |
| | Grade III | 40 | 23.0 |
| | Grade IV | 16 | 9.2 |

**Type of OA**

88%

10%

2%

■ Type of OA Knee OA ■ Type of OA Hip OA ■ Type of OA Hand OA

## Side Involvement
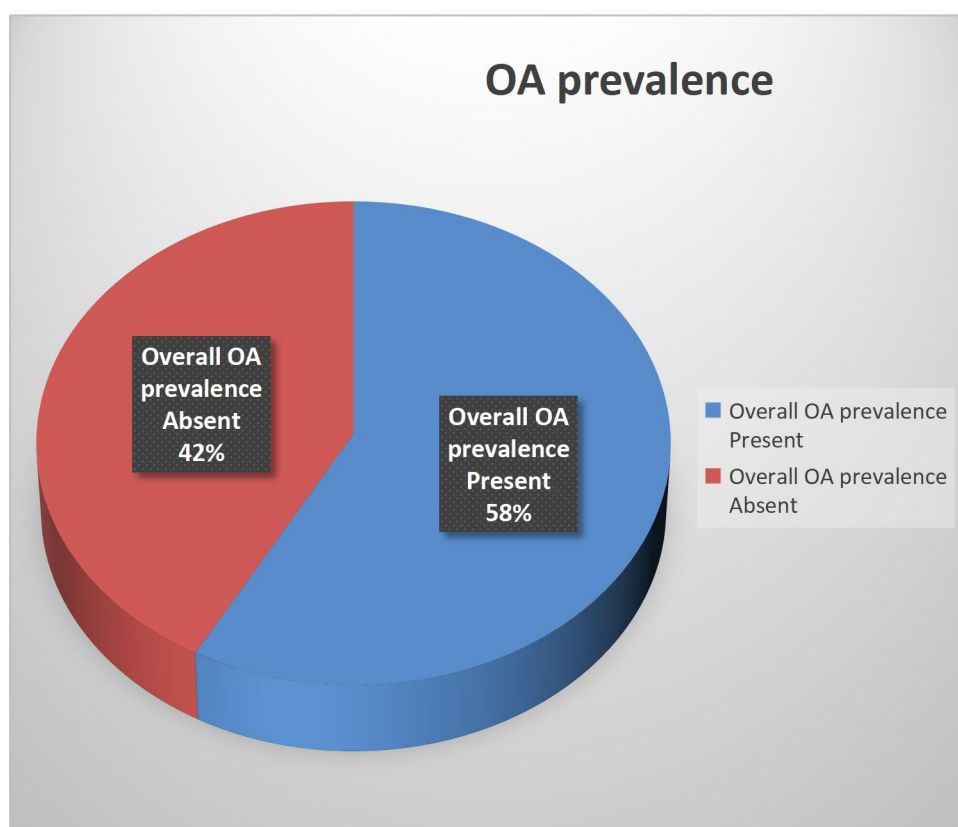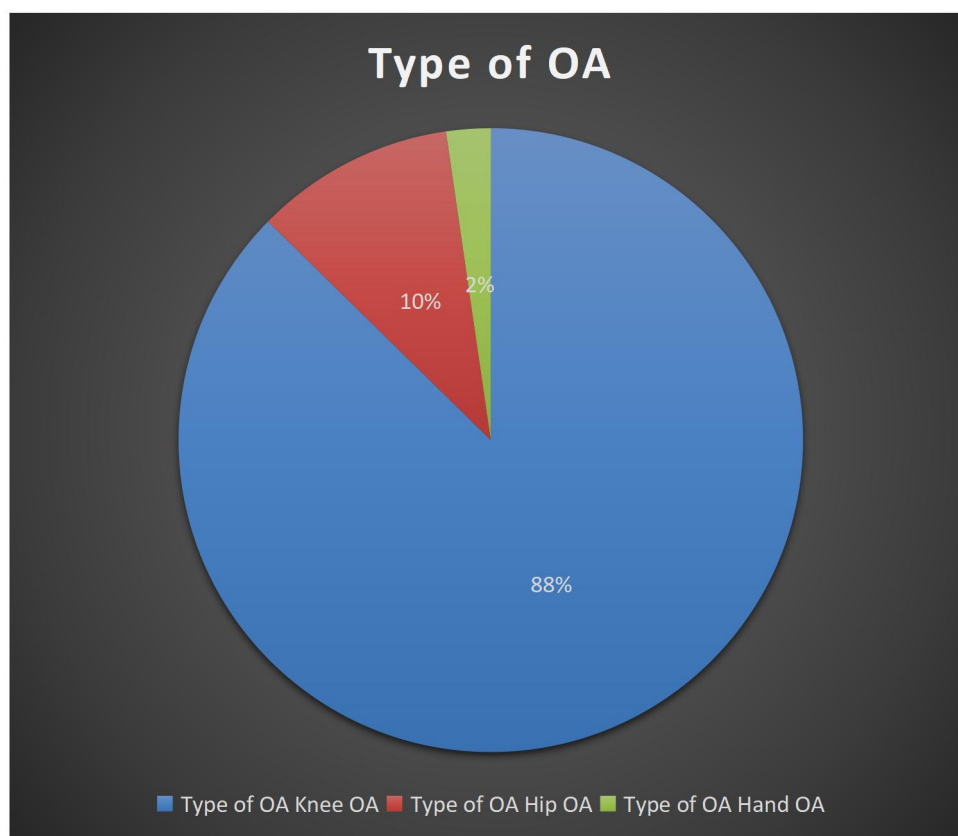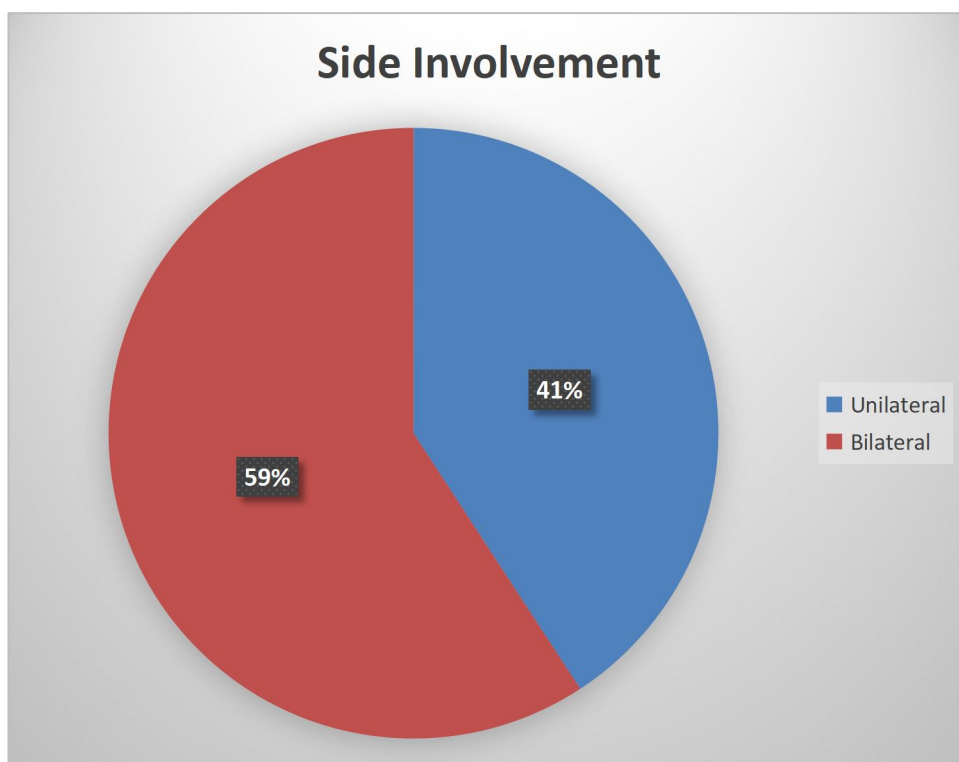


**Table 3. Distribution of Major Risk Factors among Women with OA (n = 174)**

| Risk Factor | Category | n | % |
|---|---|---|---|
| **BMI** | Overweight | 64 | 36.8 |
|  | Obese | 80 | 46.0 |
|  | Normal | 30 | 17.2 |
| **Physical Activity Risk Factor** | Low | 128 | 73.6 |
|  | Moderate | 38 | 21.8 |
|  | High | 8 | 4.6 |
| **History of** | Regular | 104 | 59.8 |

| Squatting/Kneeling | Occasional | 48 | 27.6 |
|---|---|---|---|
| | None | 22 | 12.6 |
| Parity | 1–2 children | 48 | 27.6 |
| | 3–4 children | 86 | 49.4 |
| | ≥5 children | 40 | 23.0 |

**Table 4. Association between Selected Risk Factors and Osteoarthritis**

| Risk Factor | Category | OA Present (n=174) | OA Absent (n=126) | p-value* |
|---|---|---|---|---|
| Age group | >55 years | 112 (64.4%) | 44 (34.9%) | <0.001 |
| BMI | ≥30 kg/m² | 80 (46.0%) | 30 (23.8%) | 0.002 |
| Physical Activity | Low | 128 (73.6%) | 50 (39.7%) | <0.001 |
| Squatting/Kneeling | Regular | 104 (59.8%) | 24 (19.0%) | <0.001 |
| Parity | ≥3 children | 126 (72.4%) | 52 (41.3%) | <0.001 |

## RESULTS

A total of 300 postmenopausal women from Maharashtra participated in the study. The mean age of participants was 56.1 ± 6.8 years, with the majority falling in the 51–55 years age group (30.7%). More than half of the participants (54%) resided in urban areas, while 46% were from rural regions. Overweight (37.3%) and obesity (36.7%) were common among the women.

Clinically, early menopause (≤45 years) was reported by 45.3% of the participants, and Low physical activity levels were observed in 59.3% of women.

The overall prevalence of osteoarthritis among postmenopausal women was 58% (174 out of 300). Knee OA was the most common type (50.7%), followed by hip OA (6%) and hand OA (1.3%). Among knee OA cases, bilateral involvement (59.2%) was more common than unilateral involvement.

Based on Kellgren–Lawrence grading, Grade II OA was most prevalent (43.7%), followed by Grade I (24.1%), Grade III (23%), and Grade IV (9.2%).

Analysis of risk factors showed significantly higher OA prevalence among women who were >55 years of age ($p < 0.001$), obese ($p = 0.002$), physically inactive ($p < 0.001$), engaged in regular squatting or kneeling ($p < 0.001$), and multiparous (≥3 children) ($p < 0.001$). These factors remained strongly associated with OA presence.

**DISCUSSION**

The present study aimed to determine the prevalence of osteoarthritis among postmenopausal women in Maharashtra and identify key associated risk factors. The overall OA prevalence of 58% found in this study is comparable with previous Indian reports indicating high OA burden among women over 50 years, where prevalence ranges between 45–60% (Mishra et al., 2018; Pal et al., 2016). This reinforces the growing recognition of OA as a major

musculoskeletal health concern in aging Indian women.

Consistent with literature, knee OA emerged as the most common form, accounting for over half of all OA cases. The high prevalence of knee involvement may be attributed to lifestyle habits such as floor sitting, squatting, cross-legged positions, and household activities that increase mechanical stress on the knee joints practices particularly common among women in Maharashtra. Studies from other Indian regions similarly note increased knee joint loading due to habitual squatting and kneeling (Kulkarni et al., 2016).

The sharp rise in OA prevalence among women above 55 years highlights the role of aging and hormonal decline in joint degeneration. Estrogen deficiency after menopause accelerates cartilage loss and joint inflammation, explaining the increased vulnerability to OA in this population. The significant association between early menopause and OA further supports the protective influence of estrogen on joint health.

Obesity also showed a strong association with OA in the present study. Nearly half of the OA cases occurred among obese women. Higher body weight increases joint loading, particularly on weight-bearing joints such as the knees, thus accelerating degenerative changes. This finding aligns with global evidence identifying obesity as one of the strongest modifiable risk factors for OA.

Low physical activity was another important contributor to OA. Women with sedentary lifestyles had significantly higher OA prevalence. Physical inactivity leads to muscle weakness, reduced joint stability, and poorer cartilage nutrition, which may accelerate OA onset. Encouraging structured physical exercise could therefore play a key preventive role.

Multiparity (≥3 children) emerged as another significant risk factor. Pregnancy and delivery cause biomechanical changes, weight gain, and altered posture, which may cumulatively increase joint stress over time.

Overall, the present study highlights that OA among postmenopausal women in Maharashtra is influenced by a combination of biological, lifestyle, cultural, and nutritional factors. These findings underscore the need for early screening, lifestyle modification programs, and community-based physiotherapy interventions targeting high-risk groups.

## CONCLUSION

The study concludes that osteoarthritis is highly prevalent among postmenopausal women in Maharashtra, affecting more than half of the population studied. Knee OA is the predominant form, with bilateral involvement commonly observed. Increasing age, obesity, low physical activity, frequent squatting/kneeling activities and multiparity are significant risk factors associated with OA.

Given the high disease burden, targeted interventions are essential. Early screening of postmenopausal women, community awareness programs, weight management strategies and promotion of regular physical activity should be prioritized. Physiotherapists play a key role in early detection, functional assessment, and delivering evidence-based rehabilitation to improve mobility and quality of life. Future longitudinal studies are recommended to further explore causal relationships and evaluate the effectiveness of preventive strategies.

**CONFLICT OF INTEREST:**

None

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