

Research Article**A PROSPECTIVE STUDY OF RELATIONSHIP BETWEEN AGE AND BMI ON OSTEOARTHRITIS IN GERIATRIC FEMALES IN A TERTIARY CARE HOSPITAL****Dr Rohit Madhup Lal^{1*}, Dr Sweta Lal²**

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Abstract

Introduction: Osteoarthritis (OA) is a disease with truly formidable impact. As the most common form of arthritis, it accounts for more dependency in walking, stair climbing, and other lower extremity tasks than any other disease; especially in the elderly. Musculoskeletal health is often overlooked on the public health agenda. However thanks to campaign headlines such as “the silent epidemic”, there is now greater awareness of the burden of illness caused by two of the most prevalent musculoskeletal disorders viz back pain and osteoarthritis.

Materials and methods: This cross sectional study was conducted in Orthopaedics, Samford Hospital, Ranchi, Jharkhand, India. Total 100 female participants were in age group of 46 to 65 years. Purposive sampling technique used to select study subjects. Informed written consent were taken from all study participants. Study duration was 1 year

(May 2025-April 2026). The study method involved was x-ray of knee and measurement of BMI and personal interviews of participants. Inclusion criteria were non traumatic knee pain, age within the range mentioned above and willingness to participation. Exclusion criteria were secondary OA, patients not willing to give consent.

Results: Total 50 participants were enrolled in this study. Mean age of the participants was 56.24 ± 6.34 . In 50 participants 20 (39%) participants were in age group of 46 to 55 years and 30 (61%) were in age group of 56 to 65 years. Total 33 (65%) participants were affected by knee osteoarthritis. Among them 29.2% were younger age group and 78.2% were in advanced age. BMI of knee osteoarthritis patients, ranged from 15.4% (≤ 18.5), 15.4% (18.51-24.99) and 69.2 % (≥ 25) respectively.

Conclusion: Knee osteoarthritis is significantly associated with advanced age and obesity. Advanced age and overweight were strongly associated with osteoarthritis in our population. Therefore, weight reduction and preventive measures can decrease the burden and will help in minimizing morbidity associated with OA.

Key Words: Knee osteoarthritis, Body Mass Index, Obesity, back pain.

INTRODUCTION

Osteoarthritis (OA) is a disease with truly formidable impact. As the most common form of arthritis, it accounts for more dependency in walking, stair climbing, and other lower extremity tasks than any other disease; especially in the elderly. Musculoskeletal health is often overlooked on the public health agenda.¹ However thanks to campaign headlines such as “the silent epidemic”, there is now greater awareness of the burden of illness caused by two of the most prevalent musculoskeletal disorders viz back pain and osteoarthritis. Whole journals, meetings, and learned societies are devoted to the study of these two conditions and major progress has been made towards understanding their cause and appropriate management.² It is known that person with higher body mass indexes are more likely than persons with normal BMI to report idiopathic knee pain and accompanying disability. How obesity causes OA at the knee joint has been the subject of considerable debate. Two major theories have been proposed to explain this association: Biomechanical and Systemic/Metabolic mechanism. The biomechanical theory concludes that obesity leads to repetitive application of increased

axial loading at the knee joint with consequent degeneration of articular cartilage and sclerosis of subchondral bone.³ However, obesity is not consistently associated with an excess of hip OA. Further, OA of non-weight bearing joints (distal interphalangeal joints of hands) does not support this mechanical theory. The metabolic theory proposes that some metabolic factor, or factors, correlated with obesity adversely affect cartilage and other joint structures, suggesting that obesity acts indirectly to increase the risk of knee osteoarthritis. There is considerable evidence indicating that genetic factors play an important role in determination of OA.⁴ Thus it seems to be a fact that elevated BMI is associated with knee osteoarthritis, but at the same time relatively little research has been conducted seeking direct association between these two, and then there exist some other factors also into play.⁵ Therefore this study has been undertaken to access the strength of such association if exist; also in terms of laterality and extent of knee joint involvement.

MATERIALS AND METHODS

This cross sectional study was conducted in Orthopaedics, Samford Hospital, Ranchi, Jharkhand, India.

Total 100 female participants were in age group of 46 to 65 years. Purposive sampling technique used to select study subjects. Informed written consent were taken from all study participants.

Study duration was 1 year (May 2025-April 2026).

The study method involved was x-ray of knee and measurement of BMI and personal

interviews of participants. Inclusion criteria were non traumatic knee pain, age within the range mentioned above and willingness to participation. Exclusion criteria were secondary OA, patients not willing to give consent.

Statistical analysis was done with percentages and chi square test. Data were analyzed using statistical package for the social sciences (SPSS) software v.23.0.

RESULTS

Total 50 participants were enrolled in this study. Mean age of the participants was 56.24 ± 6.34 . In 50 participants 20 (39%) participants were in age group of 46 to 55 years and 30 (61%) were in age group of 56 to 65 years. Total 33 (65%) participants were affected by knee osteoarthritis. Among them 29.2% were younger age group and 70.8% were in advanced age. BMI of knee osteoarthritis patients, ranged from 15.4% (≤ 18.5), 15.4% (18.51-24.99) and 69.2 % (≥ 25) respectively.

Demographic characteristics	Mean $\pm$ SD/%
Age (in years)	56.24 $\pm$ 6.34
BMI	25.41 $\pm$ 5.0
Age group (in years)	
46-55	20 (39)
56-65	30 (61)
Osteoarthritis affected	33 (65)
Not affected	17 (35)
Osteoarthritis affected (n=33)	
46-55	9 (29.2)
56-65	23 (70.8)
BMI (n=33)	
≤ 18.5	5 (15.4)
18.6-24.99	5 (15.4)
≥ 25	23 (69.2)

Table 1: Demographics characteristics of patients (n=50).

Age group (years)	No. participants affected	No. participants not affected	P Value
46-55	10(29.2)	10 (57.1)	0.006
56-65	23 (70.8)	7(41.9)	

Table 2: Association between knee osteoarthritis patients and age (n=50).

Table 2 shows the significant relationship between osteoarthritis patients and age. In advanced age prevalence of knee OA significantly increases i.e. (70.8% versus 29.2%, $p=0.006$).

BMI	No. participants affected	No. participants not affected	P Value
≤18.5	5(41.7)	7(58.3)	0.001
18.6-24.99	5 (47.6)	6 (52.4)	
≥25	22 (81.8)	5 (18.2)	

Table 3: Association between knee osteoarthritis patients and BMI (n=50)

BMI	Age mean (SD)	P Value
≤18.5	54.30±6.5	0.002
18.6-24.99	55.90±5.30	
≥25	60.04±4.77	

Table 4: Relationship between BMI and age of the OA patients (n=33).

DISCUSSION

In present study it was found that females in the age group of 56-65 years of age were having more significant prevalence 23 (70.8%) of knee OA compared to 46-55 years age group where 10 (29.2%) participants were affected. Out of 33 affected participants 22(69.2%) were overweight and remaining participants were having normal or BMI within the range of (≤18.5 to 24.99).⁶

Overweight is a major risk factor for knee OA. Compared with the other studies, study conducted by Sharma et al in Chandigarh UT, prevalence was found 56.6%. In Sharma et al study it was observed that increased BMI was significantly associated with the osteoarthritis.⁷

Other study conducted by Radha et al in Mysore city prevalence among females was found 63.33% and overweight with obese patients were 37.33%, who were diagnosed with osteoarthritis.⁸ Another study conducted in Maharashtra by Kamble et al, 24.1% participants in study reported knee

osteoarthritis and among them 29% females were having knee osteoarthritis.⁹

According to Bhandarkar et al study in Mumbai age specific prevalence among females was 63%.¹⁷ Other study conducted by Ganvir et al concluded that female sex and age are the risk factors for knee osteoarthritis along with obesity and physically demanding job.¹⁰

CONCLUSION

Due to increase in life expectancy in worldwide osteoarthritis will become one of the commonest diseases of advanced age with large burden on public health services. Over weight and older age were strongly associated with OA in our population. Weight reduction can reduce the disease. Due to absence of definitive treatment and high cost of surgical interventions preventive measures are necessary to reduce the prevalence of disease. Findings of this study will encourage the public health initiatives aimed at reducing obesity and identify certain groups thus decrease the future requirements for replacement surgery.

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