Research Article

# A study to determine the prevalence of osteoarthritis of knee in rural Maharashtra

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Abstract Introduction: Osteoarthritis refers to a clinical syndrome of joint pain accompanied by varying degrees of functional limitation and reduced quality of life. It is the most common form of arthritis, and one of the leading causes of pain and disability worldwide. The most commonly affected peripheral joints are the knees, hips and small hand joints. Aims and **Objectives:** To determine prevalence of Osteoarthritis knee in rural area and also to identify various Socio-Demographic factors associated with Osteoarthritis knee. Material and Methods: A longitudinal study undertaken to determine prevalence of osteoarthritis in the elderly patients. Sample size was calculated based on the Frahigham study, the prevalence of osteoarthritis was taken as 20% among elderly population. Sample size was estimated at 5% level of significance with an allowable error of 20%. Hence 400 elderly patients attending the OPD were included in the study population. Results: Majority of patients were in age group 61-70 years (44.50%). The socioeconomic status according to B.G. Prasad classification showed that 134 (33.50%) patients belong to class V (Lower class) while 118 (29.50%) patients were in class IV (lower middle class). The usage related pain in right knee joint was the main symptom among patients. (30.50%) The other symptoms were persistent knee pain (24.25%), morning stiffness (12%) and history of previous injury in 5.50% right Osteoarthritis. The overall prevalence of OA was found to be 21.50%. The age specific prevalence was found to be highest in the age group 80 and above (29.41%). The modified ACR criteria showed that the prevalence of OA was 20.58% among the males and 22.17% among the females. Conclusion: The age specific prevalence was found to be highest in the age group 80 and above. The prevalence was more in females and also among illiterate.

Keywords: Prevalence, Osteoarthritis, knee, Elderly patients.

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## **INTRODUCTION**

Osteoarthritis refers to a clinical syndrome of joint pain accompanied by varying degrees of functional limitation and reduced quality of life. It is the most common form of arthritis, and one of the leading causes of pain and disability worldwide. The most commonly affected peripheral joints are the knees, hips and small hand joints.<sup>1</sup> By the beginning of 20th century the disease had been granted its own title of "osteoarthritis", derived from the Greek words "osteo" meaning "of the bone", "arthro" meaning "joint" and "itis" meaning "inflammation".<sup>2</sup> The 20th century saw a dramatic expansion of medical techniques and rapid development of the technology available for diagnosis. One of the most important inventions of the period was the X-ray machine, and this was to prove an important tool in developing the understanding of OA. This led to a distinction being made between OA and rheumatoid arthritis.<sup>3</sup> OA is a top cause of disability in older people. The goal of treatment in OA is to reduce pain and improve function. There is no cure for the disease, but some treatments attempt to slow disease progression.<sup>2</sup> The knee is the site most affected by joint pain in older adults, where it is usually attributed to osteoarthritis in this age group.<sup>4, 5</sup> Nearly half of adults aged 50 and over report knee pain in a 1-yr period. The high prevalence of this condition, its impact in terms of disability, and the existence of modifiable risk factors, mean that identifying approaches to prevention are a public health priority. Prevalence increases with age.<sup>6,7</sup> There is a burden of suffering experienced by people with OA and that burden can be significant. Pain and functional impairment are the key domains of that burden,

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and taken together they often exert a significant reduction in Quality of life<sup>8</sup>. Occupation is also thought to play a role in OA incidence because of the potential for some jobs to cause extreme loading on joints and therefore damage the cartilage. The Framingham study<sup>9</sup> found that men whose jobs had medium or higher physical activity demands (e.g. laborers) has a higher risk of knee OA. Similarly, knee OA was more common in men and women whose job involved much knee-bending (e.g. cleaners, carpet fitters). Injuries to joints sustained earlier in life can also increase the future risk of OA as they can result in initiation sites. A knee injury even as a child or young adult has been shown to significantly increase knee OA incidence in later life by around 8%.<sup>10</sup>

# **AIMS AND OBJECTIVES**

To determine prevalence of Osteoarthritis knee in rural area. To identify various Socio-Demographic factors associated with Osteoarthritis knee.

# **MATERIAL AND METHOD**

### **Study Design**

The present study was a longitudinal study undertaken to determine prevalence of osteoarthritis and association between contributing risk factors and knee osteoarthritis in the elderly patients.

Study Period: The study period was 24 months.

**Study Population:** The study population were elderly patients attending the OPD.

### Sample Size Estimation<sup>11</sup>

Sample size was calculated with the following assumptions. Based on the Frahigham study, the prevalence of osteoarthritis was taken as 20% among elderly population. Sample size was estimated at 5% level of significance with an allowable error of 20%. Hence 400 elderly patients attending the OPD were included in the study population.

# **Inclusion Criteria**

Patients with age >40 years. Patients ready to participate in the study.

### **Exclusion Criteria**

Patients with terminal illness, psychiatric illness, deceased and severe dementia. Patients with hemiparasis, knee amputation in either lower limb. Patients on medications for osteoarthritis. Patients who could not be contacted for follow up.

### **Data collection**

The selected patients were visited and the questionnaire was administered after a written informed consent was obtained from the participants. The questionnaire consisted of two parts. The first part included sociodemographic details such as type of family, marital status, religion, education, socio-economic status (according to the standard of living index and BG Prasad's classification), and per capita income.

The second part consisted of the possible risk factors for developing OA of the knee such as age, gender, occupation, history of injury to the knee, climbing stairs regularly, and a family history of OA.

**Statistical tests applied:** Percentages, mean was done with the help of SPSS (version 17) for windows.

# RESULTS

Table 1: Distribution of Patients according to age					
Age group	No. of Patients	Percentage			
41-50	33	08.25			
51-60	123	30.75			
61-70	178	44.50			
71-80	47	11.75			
>80	19	04.75			
Total	400	100			

In the above table, it was observed that majority of patients were in age group 61-70 years (44.50%) followed by age group 51-60 years (30.75%) and 17 (4.25%) patients were above 80 years.

Table	2:	Distribution	of	Patients	on	basis	of	Socioeco	onomic	Status
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Socio-Economic Status	No. of Patients	Percentage
I	38	09.50
II	40	10.00
111	70	17.50
IV	118	29.50
V	134	33.50
Total	400	100

The socioeconomic status according to B.G. Prasad classification showed that 134 (33.50%) patients belong to class V (Lower class) while 118 (29.50%) patients were in class IV (lower middle class). Among 400 patients only 38 (9.50%) patients were in class I (Upper class)

 Table 3: Distribution of Patients according to symptoms in knee joint:\*

Symptoms	Right knee Joint (n=400) (%)	Left knee Joint (n=400) (%)		
Persistent knee pain	97 (24.25)	86 (21.50)		
Usage-related pain	122 (30.50)	99 (24.75)		
Feeling of giving away	53 (13.25)	42 (10.50)		
Morning stiffness (<30min.)	48 (12.00)	43 (10.75)		
Rest and night pain	05 (1.25)	07 (1.75)		
Previous injury	22 (5.50)	07 (1.75)		
Limited movement	24 (6.00)	19 (4.75)		

(\*Multiple response present)

The above table shows symptoms in knee joint among the patients. The usage related pain in right knee joint was the main symptom among patients. (30.50%) The other symptoms were persistent knee pain (24.25%), morning stiffness (12%) and history of previous injury in 5.50% right knee joint.

 Table 4: Age-specific prevalence of Osteoarthritis according to ACR

criteria					
Age	No. of	No. of Patients	Prevalence of		
group	Patients	with OA	OA		
41-50	33	03	09.09%		
51-60	123	22	17.89%		
61-70	178	43	24.16%		
71-80	47	13	27.66%		
>80	17	05	29.41%		
Total	400	86	21.50%		

The above table showed prevalence of osteoarthritis according to the modified ACR criteria. The overall prevalence of OA was found to be 21.50% in the population studied. The age specific prevalence was found to be highest in the age group 80 and above (29.41%) while, the age specific prevalence was lowest in the age group 41-50 years (9.09%).

 Table 5: Sex-specific prevalence of Osteoarthritis according to ACR

 criteria

Sex	No. of Patients with OA	Prevalence of OA
Male (n=170)	35	20.58%
Female (n=230)	51	22.17%
Total (n=400)	86	21.50%

The modified ACR criteria showed that the prevalence of OA was 20.58% among the males and 22.17% among the females. The prevalence in females was more than the males.

 Table 6: Prevalence of osteoarthritis according to demographic variables

Variable		No. of Patients	Patients with OA (%)
	Illiterate	68	22 (32.35)
	Primary	162	34 (20.99)
Education	Secondary	113	18 (15.92)
	Degree and Above	57	12 (21.05)
Occupation	Agriculture	151	25 (16.55)
	Laborer	62	19 (30.64)
	Housewives	139	29 (20.86)
	Others		04 (20.00)
	Unemployed	28	07 (25.00)

The prevalence of osteoarthritis was majority among illiterate (32.35%) according to education status. As per occupation prevalence was more among female.

## DISCUSSION

In the present study, it was observed that majority of patients were in age group 61-70 years (44.50%) followed

by age group 51-60 years (30.75%). 17 (4.25%) patients were above 80 years. Similar findings were observed by Felson DT *et al*<sup> $r_2$ </sup> who conducted a study to determine the longitudinal risk factors for knee OA in an elderly population. Out of 598 patients without knee OA at baseline the mean age was 70.5 years. In study by Abraham AM et  $al^{13}$  to measured the prevalence of features of osteoarthritis (OA), in the dominant hand, knees and hips using ultrasound the participants were aged 61-63 years with mean of 62 years. The finding was in relevance of our study. The mean age among elderly suggest that the life expectancy of the people had increase now a day hence there was increase in mean age among the participants. In the present study, the socioeconomic status according to B.G. Prasad classification showed that 134 (33.50%) patients belong to class V (Lower class) while 118 (29.50%) patients were in class IV (lower middle class). Among 400 patients only 38 (9.50%) patients were in class I (Upper class). The findings of the study done by Nisha Elizabeth Ajit *et al*<sup>14</sup> to measure the prevalence of knee osteoarthritis among adults in a rural area observed that the mean monthly per capita income was INR  $1022 \pm 862.5$  with 306 (89.5%) subjects having a per capita income below INR 1926. The reason for low socio economic status was the study conduction was in rural area. In our study it was observed that the most common symptoms in knee joint among the patients was the usage related pain in right knee joint (30.50%). The other symptoms were persistent knee pain (24.25%), morning stiffness (12%) and history of previous injury in 5.50% right knee joint. Similar findings were observed by Nisha Elizabeth Ajit *et al*<sup>14</sup> in the study to measure the prevalence of knee osteoarthritis among adults in a rural area. Ninety-five (27.8%) subjects had persistent pain (rest pain) in the right knee, and 122 (35.7%) subjects complained of pain in the right knee on activity. The corresponding numbers with respect to the left knee were 86 (25.1%) and 99 (28.9%). The number of subjects with persistent bilateral knee pain and bilateral usage-related knee pain were 86 (25.14%) and 99 (28.94%) respectively. In our study the prevalence of osteoarthritis according to the modified ACR criteria was the overall prevalence of OA was found to be 21.50% in the population studied. The age specific prevalence was found to be highest in the age group 80 and above (29.41%) while, the age specific prevalence was lowest in the age group 41-50 years (9.09%). The prevalence of symptomatic knee osteoarthritis was 21.2% overall while 10.7% in men and 26.7% in women. The modified ACR criteria showed that the prevalence of OA was 20.58% among the males and 22.17% among the females. The prevalence in females was more than the males. The prevalence of osteoarthritis was majority among illiterate

(32.35%). As per occupation prevalence was more among female housewives. The findings of our study were similar to Sudo A *et al*<sup>15</sup> study to examine the prevalence and risk factors for knee osteoarthritis in elderly Japanese men and women. Similarly, Singh AK et  $al^{16}$  estimated the prevalence and determinants of osteoarthritis of knee joint among elderly persons residing in an urban slum of Delhi using ACR clinical criteria. The prevalence of osteoarthritis was estimated to be 41.1%.In the study by French HP et  $al^{17}$  to investigate the prevalence of osteoarthritis (OA) in a population aged  $\geq$ 50 years in Ireland found the overall prevalence of OA was 12.9% (women-17.3%; men-9.4%). Similar findings were seen in study done by Nisha Elizabeth Ajit *et al*<sup>14</sup> where no association was found between gender and OA. The findings of the present study where in contrast with study Nisha Elizabeth Ajit *et al*  $^{14}$  where they found significant association between education and osteoarthritis. In other study, by Zhang Y et al 18 found a significant association between occupation and osteoarthritis.

## **CONCLUSION**

The overall prevalence of OA was found to be 21.50% in the population studied. The age specific prevalence was found to be highest in the age group 80 and above. The prevalence in females was more than the males. The prevalence of osteoarthritis was majority among illiterate, female. The risk of knee OA was significantly greater in patients with age  $\geq$  60 years. The risk of knee OA was not statistically significantly in females, education and occupation.

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