

A STUDY OF PREVALENCE OF KNEE OSTEOARTHRITIS AND ITS EFFECTS AMONG ELDERLY PEOPLE IN SELECTED RURAL AREA AT CHENNAI**DOMINIC AROCKIA MARY a&b****a) Ph.D. SCHOLAR, DEPARTMENT OF NURSING, MEENAKSHI ACADEMY OF HIGHER EDUCATION & RESEARCH, CHENNAI.****b) HOD/PROFESSOR, TAGORE COLLEGE OF NURSING, CHENNAI.****A.R. BHARATHI****PRINCIPAL, PERI COLLEGE OF NURSING, CHENNAI.****ABSTRACT**

Osteoarthritis (OA), the most common kind of arthritis, primarily affects the elderly. The number of people who are impaired due to this factor is high. This research was done to put a number on how many rural seniors suffer from knee OA. Five hundred retirees from rural Chennai participated in a cross-sectional survey. Quality of life was evaluated by a semi-structured interview schedule, and a clinical examination of the knee was conducted in accordance with American College of Rheumatology criteria. Nearly two-thirds (292, or 64.3%) of the 454 elderly volunteers were diagnosed with knee OA. We conducted a multivariate logistic regression analysis and found that knee injuries, knee pain in the family, current levels of physical activity, and cigarette smoking are all strongly associated with knee OA. Life satisfaction in the elderly varied significantly between those with and without knee OA ($p < 0.001$). Overall, elderly individuals with knee OA scored much lower ($P < 0.001$), with the greatest decrease occurring in the psychological and physical domains.

1. INTRODUCTION

Inflammation of a joint is what we mean when we talk about arthritis. Arthritis is characterised by joint pain, swelling, and restricted joint movement. The most common form of arthritis, osteoarthritis (OA), is a kind of joint failure in which pathologic changes occur in all of the joint's components, sometimes in concert with one another. It's a major contributor to the onset of impairment and the fourth leading cause of time lost from work due to disability [1]. Although the knees and hips are the most commonly affected, osteoarthritis (OA) can affect every joint in the body. Women over the age of 60 have a higher incidence of osteoarthritis (OA) than men do, but disease affects an estimated 10-15% of all people over 60 worldwide. Among adults aged 55 to 64, the prevalence of symptomatic knee OA is 12.1% nationally, according to NHANES III data; however, in the Johnston County OA project, this percentage climbed to 16.3%. The frequency of knee OA in people aged 55 and higher was 15.6% in men and 30.5% in women, according to data published by the Dutch Institute of Public Health. These are the numbers that represent the people who have this ailment. The prevalence of knee osteoarthritis was reported to be 13.7% in rural regions and 6.9% in urban areas in a study conducted in the Asian countries of India, Pakistan, and Bangladesh [5]. According to community studies conducted in both urban and rural regions of India, the prevalence of OA ranges from 17.6% to 60.6% [6]. [7] The worldwide Burden of Disease (GBD) survey that was conducted in 2016 found that musculoskeletal disorders (also known as MSDs) were the second biggest contributor to worldwide disability. The severity of painful MSDs can vary widely depending on a person's age; however, between 20% and 33% of people around the world live with one or more painful MSDs. [2] Arthritis is one of the conditions that fall under the category of MSDs, and it is a significant contributor to the worldwide disability burden. Data from the World Health Organization's Study of Global Ageing and Adult Health (SAGE) suggests that the prevalence of arthritis is highest in countries with low to moderate per capita income. [3] In 2017, OA was ranked as the tenth major cause of young-onset disabilities (YLDs) for men and the eleventh top cause of YLDs for women worldwide. There are 8.34 million years lost due to knee osteoarthritis. [4] Half of all MSDs are caused by osteoarthritis.

The knee is the most common joint affected by osteoarthritis (OA), which affects 9.6% of men and 18% of women worldwide over the age of 60. [5] Patients who have undergone total knee or hip replacement surgery have seen a tripling or more in the financial burden of osteoarthritis. [6] Joint and pain disorders were found to be the second most common reason for outpatient clinic visits and the fourth most common reason for out-of-pocket expenses among all non-communicable diseases in a study conducted in India and meant to be representative of the country as a whole. About 80% of the global burden of OA is attributable to osteoarthritis of the knee [7]. [1] Although it would not result in death, it would lower the quality of life (QOL) due to the fact that it would create handicap.

The prevalence of osteoarthritis of the knee has been assessed in a number of nations; however, epidemiological data on the older population in India is limited. In addition, there is a dearth of evidence in India about the impact that knee osteoarthritis has on the quality of life of the elderly.

2. MATERIALS AND METHODS

In a rural area of Tamil Nadu's Kanchipuram district, researchers conducted a cross-sectional survey of the local people. This municipality can be located in southern India. Adult participants in the study, which took place between January and December of 2021, were given a validated, pretested questionnaire to assist in reaching a diagnosis of osteoarthritis of the knee. Participants in the study needed to be at least 18 years old and be long-term residents of the area under investigation in order to qualify. Using OpenEpi Version 3.01 (Atlanta, Georgia, USA), the sample size was determined based on the assumptions that there would be a 5% alpha error, that the proportion of predicted outcome would be 26% [8] with a design effect of 1.5, and that there would be a relative precision of 10% with a nonresponsiveness rate of 20%. 1966 participants constituted the smallest possible sample size for this investigation. On the other hand, we talked to people who participated in the study in 1986. This study was carried out in the Kanchipuram district of Cheyyur Taluk. From a total of 118 villages in Cheyyur Taluk, the lucky ones were drawn to become Illedu, Agaram, Kavanoor, Manapakkam, Puthirankottai, Villipakkam, and Vanniyanallur. We chose 283 research participants from each town, assuming that they all had the same population (the average size was between 2500 and 3000). Following the selection of a house in each community's water bottle revolving game, a street was chosen at random inside that community. The first house picked at random was the one closest to the water bottle, and subsequent properties were picked in a continual pattern. After receiving written agreement and randomly selecting an eligible participant from each household, the interviewees conducted the interviews. They were required to come in for a total of two appointments before being taken out of the study. Variables examined included socioeconomic status, OA risk factors, OA prevalence, and OA severity as measured by the Lysholm knee scoring Scale.[9]

2.1 Operational definition

Knee pain, age over 50, morning stiffness, crepitus in motion, bony soreness, bony enlargement, and an absence of perceptible warmth were used in the clinical diagnosis of knee osteoarthritis according to the American College of Rheumatology's (ACR)[10] criteria. Clinical diagnosis of knee osteoarthritis required the presence of knee pain in addition to any three of the other criteria. This was the only way the diagnosis could be made. According to the Joint National Committee 7 criteria, a person is considered to have hypertension (HTN) if they have experienced at least two episodes in which their systolic blood pressure (BP) was greater than 140 mmHg and/or their diastolic BP was greater than 90 mmHg.[11] According to the American Diabetes Association, a diagnosis of diabetes requires the presence of the characteristic symptoms of diabetes (polyphagia, polyuria, and polydipsia) as well as two abnormal blood sugar values (fasting blood sugar 126 mg/dl or random blood sugar 200 mg/dl). [12] Participants' socioeconomic status was calculated using an updated version of the BG Prasad scale (first released in 2014).[13]

2.2 Statistical analysis

Data was entered using Microsoft Office Excel 2007 (Redmond, Washington, USA), and analysed with SPSS for Windows 16.0 (Chicago, SPSS Inc.). The average, median, and frequency distributions were determined. The level of association between the two categorical variables was analysed using the Chi square test, and a P-value of less than 0.05 was considered statistically significant. The degree of association was evaluated using binary logistic multivariable regression models, and the results were expressed as an odds ratio along with a confidence range for 95% of the value. Cigarette and

alcohol use, diet, amount of physical exercise, family history of knee osteoarthritis, blood sugar, blood pressure, thyroid, weight, age, education level, occupation, and socioeconomic position were all considered independent variables. The outcome variable was osteoarthritis of the knee.

3. RESULTS

Results showed that 27.1% of participants had OA knee, with a 95% confidence interval (CI) of 25.2-29.1. Many more people over the age of 50 were afflicted than those under that age. In addition, the researchers discovered a strong correlation between older participants' ages and the prevalence of OA. When compared to those under the age of 50, those above the age of 50 had a 7.7 (6.2–9.6) times greater chance of suffering from knee OA. The study found that the prevalence of OA knee was statistically (P 0.01) higher in non-graduates than in graduates, and that the prevalence of OA knee decreased with education level. The frequency of OA knee was significantly higher among those with lower levels of education (P 0.01). It was shown in the study that stay-at-home mothers have a considerably increased risk of developing knee osteoarthritis compared to those in the professional group (P > 0.001). When compared to Class 1, those in lower socioeconomic groups (Class 5) had a 2.6 times greater incidence of osteoarthritis of the knee [Table 1].

Results showed that 27.1% of participants had OA knee, with a 95% confidence interval (CI) of 25.2-29.1. Those above the age of 50 accounted for a disproportionate share of the affected population. In addition, the researchers discovered a strong correlation between older participants' ages and the prevalence of OA. In comparison to those under the age of 50, those over the age of 50 had a 7.7 (6.2-9.6) higher risk of developing knee OA. Non-graduates had a significantly (P 0.01) greater prevalence of OA knee than graduates, and the prevalence of OA knee reduced with increasing levels of education. The frequency of OA knee was significantly higher among those with lower levels of education (P 0.01). It was shown in the study that stay-at-home mothers have a considerably increased risk of developing knee osteoarthritis compared to those in the professional group (P > 0.001). When compared to Class 1, those in lower socioeconomic groups (Class 5) had a 2.6 times greater incidence of osteoarthritis of the knee [Table 1].

Relationship between way of life and osteoarthritis of the knee: The study found that cigarette smokers had a considerably increased risk of developing knee osteoarthritis than nonsmokers. The 95% CI for the odds ratio was 2.4–3.6, therefore the range of possible values was large. This difference was statistically significant. In a similar vein, those who did not engage in any form of physical activity had a greater likelihood of developing osteoarthritis of the knee compared to those who engaged in even moderate levels of physical activity. The recent study found that DM, hypertension, and knee osteoarthritis are all interconnected. When compared to responders who did not have diabetes, those with diabetes had a 2.1 times higher risk of getting osteoarthritis of the knee. [Respondents with a positive family history were more likely to develop knee osteoarthritis than those without a family history, as shown in Table 2. After accounting for age, a multivariable analysis was also conducted in order to control the confounding factors.

Table 1: Knee joint osteoarthritis and sociodemographic factors (n = 1988)

Characteristics	OA		OR (95% CI)	P
	Present (%)	Absent (%)		
Age group (years)				
≥50	385 (52.0)	355 (48.0)	7.7 (6.2-9.6)	0.00
>50	153 (12.3)	1093 (87.7)		
Gender				
Female	376 (29.8)	884 (70.2)	1.4 (1.2-1.9)	0.00
Male	162 (22.3)	564 (77.7)		
Education				
Graduate and above	6 (5.5)	103 (94.5)	Reference	
Illiterate	362 (42.6)	488 (57.4)	12.7 (5.5-29.3)	0.00
Primary	82 (26.9)	223 (73.1)	6.3 (2.6-14.9)	
Middle	62 (20.6)	239 (79.4)	4.4 (1.8-10.6)	
High school	20 (6.3)	295 (93.7)	1.1 (0.5-2.9)	
Higher secondary	6 (5.7)	100 (94.3)	1.1 (0.3-3.3)	

The significant Chi square test showed that the model was appropriately fitted (the Chi square value was 19.03, and the P value was 0.015). The coefficient of determination (r²) for the model is 0.269 for Cox and Snell and 0.39 for Nagelkerke, indicating that the model accounts for between 26.9% and 39% of the variance in the dependent variable. According to the findings of the study, characteristics such as being over the age of 50, being female, being illiterate, having a positive family history, smoking, having a history of chikungunya, high blood pressure, and diabetes are all independent risk factors for knee joint osteoarthritis [Table 3]. The Lysholm knee scoring was used to determine the degree of severity of the osteoarthritis (OA) that was present in the 538 participants who represented 27 percent of the total study population.

357 knees were determined to be in bad condition among the 538 patients diagnosed with knee OA. Based on these results, it was determined that 32.7% of patients exhibited left-sided calf muscle wasting and that 32.6% exhibited right-sided wasting. Similarly, 181 (33.6%) responders indicated left-sided quadriceps wasting, whereas 161 (29.9%) reported right-sided wasting. About half of them had muscle weakness on at least one side. About a fifth of the patients, or 114 (21.2%), had limited left-side flexion motion, whereas another fifth, or 112 (20.8%), had limited right-side flexion motion. Only 139 (24.8%) of the patients were able to fully extend their knees.

3.1 Discussion

According to our research, 27.1% of the rural population in the Kanchipuram district has osteoarthritis (OA), with a prevalence of 22.3% among males and a prevalence of 29.8% among females. According to the ACR, a total prevalence of 17% was also discovered in a study conducted in rural Bengaluru with a sample size of 342. The incidence was lower in men (15.5%) than in women (18.8%).[14] Possible explanations for the aforementioned discrepancies in OA Knee prevalence include regional variances and the use of updated versus outdated versions of the ACR criteria in the former study. The current study indicated that the prevalence of OA rose with age (age >50 years 52%, common in the senior age group, prevalence in the age group over 50 with a prevalence of 52%). Furthermore, the chances ratio increased with participant age.

Table 2: Factors associated with knee osteoarthritis: a multivariate logistic regression analysis

Determinants	Adjusted OR (95% CI) Multivariable	P
Age >50	5.6 (4.3-7.2)	0.001
Female gender	1.6 (1.2-2.1)	0.001
Illiterate	4.1 (1.6-10.2)	0.002
Socioeconomic Class 5	1.2 (0.7-1.8)	0.78
Positive family history	2.5 (1.8-3.5)	0.001
Tobacco usage	1.4 (1.1-1.8)	0.004
Diabetes	1.1 (0.5-1.6)	0.90
Hypertension	1.9 (1.3-2.7)	0.001
History of chikungunya	1.8 (1.1-3.3)	0.03

OR: Odds ratio, CI: Confidence interval

CONCLUSION

Osteoarthritis places a significant burden on the population of developing countries, but this issue is frequently disregarded despite the fact that rates of non-communicable illnesses are on the rise and there are already established methods for evaluating risk factors. Since it is the fourth most important

factor contributing to poor quality of life among the aged, it is crucial that steps be done to abolish the risk factors for osteoarthritis in future generations in order to ensure a productive life for the labour force of a nation. among particular, OA knee was found to be prevalent among people who were over the age of 50, female, smokers, illiterate, from a low socioeconomic background, had a positive family history of OA, diabetes, or hypertension. Knee osteoarthritis was a significant health problem here.

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