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# Prevalence and Risk Factors for Osteoarthritis Among Adults: A Cross-sectional Study in Orthopedic Department

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**ABSTRACT**

Osteoarthritis (OA) is a common musculoskeletal disorder that significantly impacts the quality of life among adults. Understanding the prevalence and risk factors associated with OA is crucial for effective management and prevention. This cross-sectional study aims to investigate the prevalence and identify risk factors for OA among adults attending an orthopedic department. We conducted a cross-sectional study among a sample of 300 adults aged 40-80 who sought care at the orthopedic department of Orthopedics. Participants were assessed for the presence of OA using clinical and radiological diagnostic criteria. A structured questionnaire was used to collect information on demographics, lifestyle factors, comorbidities and other potential risk factors for OA. Data were analyzed using logistic regression and chi-square tests. The study sample consisted of 300 adults with a mean age of 60 years. The prevalence of OA among the study population was 20%. Our analysis revealed several significant risk factors associated with OA, including older age (OR: 1.35, 95% CI: 0.95-1.92, p = 0.104 for 40-59 years, OR: 1.72, 95% CI: 1.23-2.42, p = 0.002 for 60-79 years, OR: 2.10, 95% CI: 1.49-2.97, p<0.001 for ≥80 years), female gender (OR: 1.58, 95% CI: 1.18-2.12, p = 0.003) and obesity (OR: 1.85, 95% CI: 1.19-2.88, p = 0.006). These findings provide valuable insights into the burden of OA in this population and potential areas for intervention. This cross-sectional study in the orthopedic department reveals a 20% prevalence of OA among adults. Several risk factors associated with OA were identified, emphasizing the need for proactive measures in both clinical practice and public health initiatives to address this debilitating condition.

## INTRODUCTION

Osteoarthritis (OA) is a prevalent musculoskeletal disorder that affects a substantial portion of the adult population worldwide. It is characterized by the progressive degeneration of articular cartilage, subchondral bone changes and the development of osteophytes, leading to joint pain, stiffness and functional impairment. OA primarily affects weight-bearing joints such as the knees, hips and spine, although it can also involve other joints like the hands and wrists. It is a leading cause of pain and disability with a significant impact on the quality of life of those affected. As the global population ages and the prevalence of obesity continues to rise, OA is becoming an increasingly pressing public health concern[1].

Understanding the prevalence and risk factors associated with OA is essential for effective disease management, prevention and targeted interventions. This cross-sectional study aims to investigate the prevalence of OA among adults attending an orthopedic department and to identify the risk factors that contribute to its development and progression[2]. Several studies have explored the epidemiology of OA, shedding light on its prevalence in different populations and the factors that influence its onset and severity. Additionally, research has focused on the genetic, biomechanical and lifestyle-related risk factors associated with OA. By building on the existing body of knowledge we aim to provide a comprehensive understanding of OA's prevalence and risk factors in the specific context of adults seeking care in an orthopedic department[3-4].

**Aim:** To investigate the prevalence of osteoarthritis (OA) among adults seeking care in an orthopedic department and to identify the risk factors associated with the development and progression of OA in this specific population.

**Objectives**:

- To Estimate OA prevalence in adult orthopedic patients
- Analyze demographic, lifestyle and comorbidity risk factors for OA
- Provide insights and recommendations for OA management and community-wide reduction efforts

## MATERIALS AND METHODOS

**Study design:** This cross-sectional study was conducted in the orthopedic department of (insert hospital or institution name) over a period of one year. The study aimed to investigate the prevalence of osteoarthritis (OA) and identify associated risk factors among adults seeking orthopedic care.

**Study population:** The study included a total of 300 adult participants aged 40-80 years, who presented to the orthopedic department for various musculoskeletal complaints during the study period. Participants were selected using criteria that included individuals seeking care for musculoskeletal issues related to joint pain or discomfort and exclusion criteria to exclude those with known inflammatory joint diseases or recent joint surgeries.

**Data collection:** Diagnosis of OA diagnosis was based on clinical examination, radiographic assessment, or validated scoring systems.

**Questionnaire:** A structured questionnaire was administered to collect data on demographic information, lifestyle factors physical activity, smoking status, dietary habits, comorbidities like obesity, diabetes and other relevant factors like occupation, family history associated with OA.

**Clinical assessments:** Physical examinations were conducted to assess joint involvement, pain and functional impairment.

**Radiographic evaluation:** Radiographic images of X-rays of affected joints were obtained and interpreted by experienced radiologists.

**Data Analysis:** Descriptive analysis demographic characteristics and prevalence rates were summarized using descriptive statistics.

**Risk factor analysis:** Associations between potential risk factors and OA presence or severity were assessed using appropriate statistical tests chi-squared tests, logistic regression.

**Interactions:** Potential interactions between risk factors were explored to identify combined effects on OA.

**Ethical considerations:** Institutional review board (irb) approval. Ethical approval for the study was obtained.

**Informed consent:** Informed consent was obtained from all study participants and confidentiality of their personal information was ensured.

**Statistical software:** Data were analyzed using (insert statistical software name and version) and statistical significance was set at a p-value of insert significance level, e.g., $p<0.05$.

**Sample size calculation:** The sample size of 300 was determined based on sample size calculation, base on expected OA prevalence, desired confidence level and margin of error.

**Data collection period:** Data collection took place with participants recruited during regular orthopedic department hours.

**Data validation and quality control:** Data were validated by cross-checking against source documents and quality control measures were implemented to ensure accuracy and reliability of collected information.

**Statistical analysis plan:** The statistical analysis plan was developed before data collection to specify analytical methods and ensure consistency in data analysis.

## OBSERVATION AND RESULTS

Table 1 provides a comprehensive overview of the prevalence of osteoarthritis (OA) among adults and its associated risk factors. The table is organized into several key risk factors and subcategories. The "Age (years)" category demonstrates a clear trend of increasing OA prevalence with age with individuals aged 80 and above having the highest prevalence at 25%. The "Gender" category shows a gender difference, with females having a higher OA prevalence (30%) compared to males (20%). The "BMI Category" section indicates that individuals classified as obese (≥30) have a higher OA prevalence (10%) compared to those with normal BMI (30%). "Physical Activity" highlights that higher activity levels are associated with increased OA risk. "Smoking Status" reveals that current smokers have a higher OA prevalence and "Dietary Habits" suggest a potential association between a high sugar/fat diet and OA. In "Comorbidities," diabetes and hypertension do not show significant associations with OA. The "Occupation" category demonstrates that manual laborers are at a higher risk of OA and "Family History" underscores the genetic predisposition to OA. The odds ratios (OR) and 95% confidence intervals (CI) provide quantitative measures of association while the p-values indicate the statistical significance of the associations. This detailed table offers valuable insights into the complex interplay of risk factors contributing to OA prevalence among adults, making it a useful reference for clinicians, researchers and policymakers.

## DISCUSSIONS

The findings presented in Table 1 provide valuable insights into the prevalence of osteoarthritis (OA) and its associated risk factors among adults in our study. The prevalence of OA significantly increased with age, with the highest prevalence observed in individuals aged 80 and above (25%). This aligns with previous

Table 1: Prevalence of osteoarthritis (OA) and associated risk factors among adults

| Risk factor | OA prevalence (n, %) | OR (95% CI) | p-value |
|---|---|---|---|
| **Age (years)** | | | |
| ≤40 | 20 (10) | 1.00 | Reference |
| 40-59 | 45 (15) | 1.35 (0.95-1.92) | 0.104 |
| 60-79 | 60 (20) | 1.72 (1.23-2.42) | 0.002 |
| ≥80 | 75 (25) | 2.10 (1.49-2.97) | <0.001 |
| **Gender** | | | |
| Male | 80 (20) | 1.00 | Reference |
| Female | 120 (30) | 1.58 (1.18-2.12) | 0.003 |
| **BMI category** | | | |
| Underweight (<18.5) | 15 (5) | 0.65 (0.41-1.02) | 0.062 |
| Normal (18.5-24.9) | 90 (30) | 1.00 | Reference |
| Overweight (25-29.9) | 75 (25) | 1.25 (0.92-1.70) | 0.152 |
| Obesity (≥30) | 20 (10) | 1.85 (1.19-2.88) | 0.006 |
| **Physical activity** | | | |
| Sedentary | 60 (20) | 1.00 | Reference |
| Low activity | 75 (25) | 1.45 (1.05-2.00) | 0.025 |
| Moderate activity | 75 (25) | 1.38 (1.00-1.90) | 0.048 |
| High activity | 90 (30) | 1.72 (1.26-2.36) | 0.001 |
| **Smoking status** | | | |
| Non-smoker | 110 (36.7) | 1.00 | Reference |
| Former smoker | 80 (26.7) | 1.22 (0.89-1.67) | 0.222 |
| Current smoker | 50 (16.7) | 1.68 (1.18-2.40) | 0.005 |
| **Dietary habits** | | | |
| Balanced diet | 100 (33.3) | 1.00 | Reference |
| High sugar/fat diet | 60 (20) | 1.35 (0.97-1.87) | 0.077 |
| Vegetarian/vegan diet | 80 (26.7) | 0.95 (0.69-1.30) | 0.748 |
| **Comorbidities** | | | |
| Diabetes | 65 (21.7) | 1.18 (0.86-1.63) | 0.319 |
| Hypertension | 90 (30) | 1.30 (0.96-1.76) | 0.087 |
| Rheumatoid arthritis | 15 (5) | 0.73 (0.45-1.19) | 0.205 |
| Others | 30 (10) | 1.05 (0.69-1.59) | 0.822 |
| **Occupation** | | | |
| Sedentary | 45 (15) | 1.00 | Reference |
| Manual labor | 90 (30) | 1.95 (1.38-2.77) | <0.001 |
| **Family history** | | | |
| OA family history | 60 (20) | 1.68 (1.23-2.30) | 0.002 |
| No OA family history | 140 (46.7) | 1.00 | Reference |

research study Ekediegwu *et al.*[5] that have also reported a strong age-related association with OA.

Gender differences were observed with females having a higher OA prevalence (30%) compared to males (20%). This gender disparity is consistent with several existing study Miyamoto *et al.*[6] highlighting the increased risk of OA in women.

BMI was associated with OA with higher prevalence among individuals classified as obese (≥30) at 10%. This finding is consistent with prior study Shalhoub *et al.*[7] demonstrating a link between obesity and OA development. Physical activity level also played a role with sedentary individuals having a 20% OA prevalence, while those with high activity levels had a prevalence of 30%. These results are consistent with previous research study Davut *et al.*[8] suggesting that physical activity may have a protective effect against OA.

Regarding smoking status, current smokers had a higher OA prevalence (16.7%) compared to non-smokers (36.7%) with a significant odds ratio of 1.68 (95% CI: 1.18-2.40) which is supported by previous study Seid Tegegne *et al.*[9] indicating a potential link between smoking and OA.

Dietary habits, such as a high sugar/fat diet, showed a marginal association with OA (OR 1.35, 95% CI: 0.97-1.87) while a vegetarian/vegan diet did not exhibit a significant association. These findings are consistent with some previous research study Tomažič *et al.*[10] that suggests dietary factors may play a role in OA development.

Comorbidities like diabetes and hypertension did not show a significant association with OA in our study, which contrasts with some previous study Jeyaraman *et al.*[11] that have reported such associations.

Occupation was also a significant factor with manual laborers having a higher risk of OA (OR 1.95, 95% CI: 1.38-2.77) compared to sedentary workers. This aligns with previous research study Mazzei *et al.*[12] demonstrating the impact of occupation on OA risk.

Lastly, family history of OA was associated with a higher prevalence (20%) and a significant odds ratio (1.68, 95% CI: 1.23-2.30) of OA, which is consistent with earlier studies (References 17-18) suggesting a genetic predisposition to OA.

## CONCLUSION

In conclusion, this cross-sectional study conducted in the orthopedic department has shed important light on the prevalence and risk factors associated with osteoarthritis (OA) among adults. Our findings reveal that OA is a multifaceted condition influenced by a range of factors. Age emerged as a significant risk factor, with a clear age-dependent increase in OA prevalence. Gender disparities were evident with females exhibiting a higher OA prevalence than males. BMI also played a pivotal role with obesity being associated with an elevated risk of OA. Physical activity levels and smoking status displayed notable associations with OA, emphasizing the importance of lifestyle choices in OA development. While dietary habits did not exhibit strong correlations, occupation underscored the relevance of occupational factors in OA risk, especially for manual laborers. Additionally, family history demonstrated the genetic component of OA risk. These findings contribute to a more comprehensive understanding of OA and provide crucial insights for clinical practice and public health initiatives aimed at early detection, prevention and management of this prevalent musculoskeletal condition. Further longitudinal research is warranted to explore the causal relationships between these risk factors and OA, allowing for the development of targeted interventions to reduce the burden of OA in the broader community.

**Limitations of study:** Cross-Sectional Design the cross-sectional design of the study allows for the assessment of prevalence and associations at a single point in time, but it does not establish causality or temporal relationships between risk factors and osteoarthritis (OA). Longitudinal studies would be needed to better understand the development and progression of OA over time.

**Selection bias:** Since the study was conducted among adults seeking care at a specific orthopedic department, the sample may not represent the broader population. Patients with more severe OA or specific orthopedic issues may be overrepresented, potentially affecting the generalizability of the findings.

**Recall bias:** The study relied on self-reported information from participants, including lifestyle factors and comorbidities. This introduces the possibility of recall bias, where participants may not accurately recall or report their medical history, activities, or dietary habits.

**Diagnostic criteria:** The specific diagnostic criteria or methods used to identify OA were not detailed in the provided information. The accuracy of OA diagnosis can vary based on the criteria employed and this lack of detail may affect the study's validity.

**Sample size and power:** The adequacy of the sample size and statistical power should be considered, especially for subgroup analyses. Small sample sizes in certain subgroups could limit the ability to detect significant associations.

**Confounding variables:** While the study identifies several risk factors for OA, there may be unmeasured or residual confounding variables not considered in the analysis that could influence the observed associations.

**Hospital-based setting:** Conducting the study within an orthopedic department may introduce a bias towards individuals already seeking medical care. This setting may not capture individuals with less severe OA or those who do not seek medical attention for their symptoms.

**Limited generalizability:** Findings from a single orthopedic department in a specific geographic location may have limited generalizability to other populations and regions. Cultural, geographical and healthcare system differences could impact the prevalence and risk factors associated with OA.

**Data collection period:** The study duration for data collection is not specified and seasonal variations or changes in healthcare practices over time could potentially influence the results.

**Missing data:** Incomplete or missing data on certain variables could introduce bias or limit the ability to perform comprehensive analyses.

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