

# CUIDADO É FUNDAMENTAL

Escola de Enfermagem Alfredo Pinto – UNIRIO

INTEGRATIVE REVIEW OF LITERATURE

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## MODIFIABLE RISK FACTORS RELATED TO OSTEOARTHRITIS AMONG OLDER PEOPLE

*Fatores de riscos modificáveis relacionados a osteoartrite entre pessoas idosas**Factores de riesgo modificables relacionados con la osteoartritis entre personas mayores***Renata Moreira Montenegro**<sup>1</sup> **Gilka Paiva Oliveira Costa**<sup>2</sup> **Antônia Lêda Oliveira Silva**<sup>3</sup> **Josiane Maria Oliveira de Souza**<sup>4</sup> **Karoline Lima Alves**<sup>5</sup> **Luiz Fernando Rangel Tura**<sup>6</sup> 

### ABSTRACT:

**Objective:** to seek evidence on modifiable risk factors that are related to the development of knee and hip osteoarthritis among elderly people. **Method:** this is an integrative review guided by PRISMA, in the Lilacs, Scopus, Medline, SciELO and Web of Science databases. **The following descriptors were used:** Elderly; Aging; Osteoarthritis; Hip; Knee; Risk factors. **Results:** seven articles were identified highlighting the sovereignty of risk factors related to overweight and/or obesity for the development of knee and hip osteoarthritis among elderly people. **Conclusion:** the results demonstrated the need for weight control to prevent osteoarthritis among elderly people and the development of more studies on the subject.

**DESCRIPTORS:** Health of the elderly; Osteoarthritis; Prevention; Review.

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**RESUMO:**

**Objetivo:** buscar evidências sobre os fatores de riscos modificáveis que estão relacionados ao desenvolvimento da osteoartrite de joelho e quadril, entre as pessoas idosas. **Método:** trata-se de uma revisão integrativa norteada pelo PRISMA, nas bases de dados Lilacs, Scopus, Medline, SciELO e Web of Science. **Utilizou-se os descritores:** Idoso; Envelhecimento; Osteoartrite; Quadril; Joelho; Fatores de Risco. **Resultados:** identificou-se sete artigos com destaque para soberania dos fatores de risco relacionados ao sobrepeso e/ou obesidade para o desenvolvimento da osteoartrite de joelho e quadril, entre as pessoas idosas. **Conclusão:** os resultados demonstraram a necessidade do controle do peso para prevenção da osteoartrite entre as pessoas idosas e do desenvolvimento de mais estudos sobre a temática.

**DESCRITORES:** Saúde do idoso; Osteoartrite; Prevenção; Revisão.

**RESUMEN**

**Objetivo:** buscar evidencia sobre factores de riesgo modificables que se relacionan con el desarrollo de osteoartritis de rodilla y cadera en personas mayores. **Método:** se trata de una revisión integradora guiada por PRISMA, en las bases de datos Lilacs, Scopus, Medline, SciELO y Web of Science. **Se utilizaron los siguientes descriptores:** Adulto mayor; Envejecimiento; Osteoartritis; Cadera; Rodilla; Factores de riesgo. **Resultados:** fueron identificados siete artículos que destacan la soberanía de los factores de riesgo relacionados con el sobrepeso y/u obesidad para el desarrollo de artrosis de rodilla y cadera en personas mayores. **Conclusión:** los resultados demostraron la necesidad del control de peso para prevenir la artrosis en personas mayores y el desarrollo de más estudios sobre el tema.

**DESCRIPTORES:** Salud del anciano; Osteoartritis; Prevención; Revisión.

**INTRODUCTION**

Osteoarthritis (OA) is the most common form of arthritis in adults, characterized by chronic pain and loss of mobility. Osteoarthritis occurs more frequently after the age of 40 and the prevalence increases sharply with age.<sup>1</sup> Osteoarthritis is the most frequent clinical condition of the musculoskeletal system in the world and is characterized by alterations in the structure and function of the joints, involving the articular cartilage, the underlying bone and the soft tissues.<sup>2</sup>

The main symptom of osteoarthritis is pain, which initially starts after using the joint and is relieved with rest. As the disease progresses, pain can occur with minimal exertion or even at rest. Other symptoms such as joint crepitus, joint stiffness of less than 15 minutes, and sometimes inflammation, with significant biomechanical changes, can be the cause of these patients' functional limitation and incapacity.<sup>3</sup> It can be understood as a cartilaginous insufficiency resulting from mechanical, genetic, hormonal, bone and metabolic factors, leading to a degradation of the cartilaginous tissue and consequent bone remodeling and synovial inflammation.<sup>2</sup>

Osteoarthritis is a well-known cause of chronic pain and disability. As well as impacting on physical health, it can have negative effects on mental health. There is also evidence that OA is a risk factor for developing cardiovascular disease, but the mechanisms are not yet well documented, possibly due to the difficulty of practicing physical activity.<sup>4</sup>

Pain and functional limitations are important sequelae of OA, with significant impacts on people's lives, particularly increased activity limitations, loss of dexterity and mobility problems, often leading to negative social consequences. OA plays a particularly important role in the context of increased risks due to its high prevalence in the population among adults over

50 (between 22-38%), with prevalence increasing with increasing age.<sup>5</sup>

The World Health Organization (WHO) has designated 2021-30 as the decade of healthy ageing, which highlights the need to address diseases such as osteoarthritis, which strongly affect functional capacity and quality of life.<sup>1</sup> Healthy ageing has been defined as a process of creating and improving opportunities to maintain and improve health, independence and quality of life.<sup>5</sup>

On the sites that OA can affect the knees, hands, hips and spine can have a considerable impact on the individual, causing pain and disability. The disability caused by OA negatively affects individuals' daily activities, leading to a decrease in their quality of life.<sup>6,7</sup> However, it is well known that hip and knee osteoarthritis are the main causes of global disability and, given the ageing of the world's population and changes in modern lifestyles, an increase in these problems is expected in the healthcare system. This is driving the need to develop studies aimed at the primary prevention of OA, especially on knowledge of modifiable risk factors.<sup>8</sup>

Thus, knowing the factors that impact on the development of osteoarthritis, especially the modifiable ones, is essential to prevent and mitigate the progression of joint damage, improving quality of life and physical function. Especially with the increase in longevity of the Brazilian and world population,<sup>9,10</sup> knowledge of modifiable risk factors can guide the orientation and conduct of health professionals and thus contribute to healthier and more active ageing.

In this sense, the research question that guided this review was: what does the scientific evidence describe about modifiable risk factors related to the development of knee and hip osteoarthritis among the elderly? The aim of this review is to look

for evidence on the modifiable risk factors that are related to the development of knee and hip osteoarthritis in the elderly.

**METHOD**

This is a literature review, structured according to the recommendations of the Joanna Briggs Institute (JBI) and written using the Checklist Preferred Reporting for Systematic Reviews and Meta Analyses extension for Scoping Reviews.11

The research question was constructed using the Population, Variables and Outcomes (PVO) strategy with the mnemonic: P - elderly people > 60 years, considering international references; V - modifiable risk factors; O - development of knee and hip osteoarthritis. Thus, the guiding question adopted was: What modifiable risk factors are related to the development of knee and hip osteoarthritis among the elderly?

Eligible were original national and international scientific articles, quantitative, qualitative or mixed methods studies, published in indexed journals, peer-reviewed, available in full format and online, published between 2019 and 2024; which addressed the topic of modifiable risk factors related to the development of knee and hip osteoarthritis. The exclusion criteria were: duplicate articles, review articles, editorials, responses to the editor, letters and articles with samples < 60 years old. In cases of disagreement between the researchers, a consensus was reached for selection. Preliminary filters were carried out regarding the period and languages in the chosen databases.

The search for articles took place in April 2024, involving the following sources of information, using institutional access to the Capes Journal Portal / CAFe Access (Federated Academic Community): National Library of Medicine - PubMed, Scopus (Elsevier), Web of Science, Latin American and Caribbean Literature in Health Science (LILACS)/BVS and Scientific Electronic Library Online -SciELO. After locating the list of Health Sciences Descriptors (DeCS/MeSH), available on the VHL-MS portal (<http://decs.bvs.br>), the following descriptors were used: (Aged OR Elderly OR Aging) AND Osteoarthritis AND (Knee OR Hip) AND (Risk factors); (Elderly OR Aging) AND Osteoarthritis AND (Hip OR Knee) AND (Risk factors).

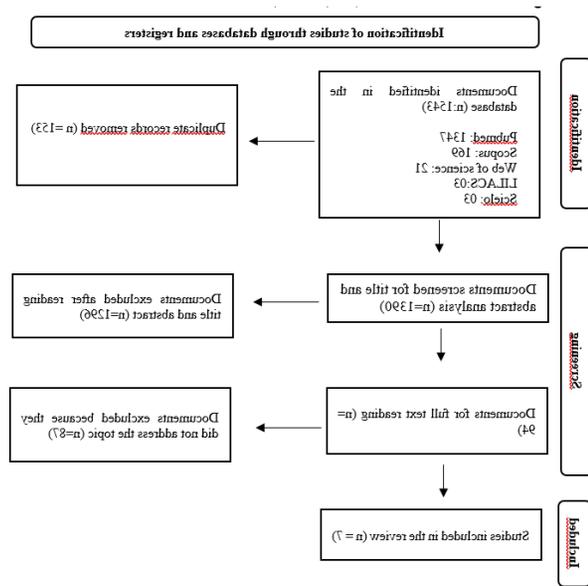
The files containing the results of the search in each of the seven sources of information were uploaded to Zotero Software and the duplicate removal function was applied. Two researchers held an alignment meeting and calibration test with 50 documents. They then began to analyze and select the articles, first involving titles and abstracts and then analyzing the full text.

Data was extracted from the final articles selected using a tool containing information on the title, name of the author(s), year, location of the study, type of study, sample and results related to the aim of this review. The results were organized and presented in figures and tables with narrative summaries.

**RESULTS**

A total of 1,543 articles were identified and 1,390 articles remained after duplicate articles were removed. A total of 1296 articles were excluded after reading the titles and abstracts. The full text of 96 articles was then analyzed and 87 articles were excluded as they did not meet the eligibility criteria for this study, with 7 (seven) articles being included in the review (Figure 1).

**Figure 1** - Flowchart of the process of identifying and selecting studies for the review, according to PRISMA. João Pessoa, PB, Brazil, 2024.



Fonte: survey data, 2024.

The time span of the studies was from 2019 to 2024, with a predominance of publications in 2023 - Park, J, 2023;12 Sundaram et al., 2023;13 and Ji et al., 2023.14 As for the location of the study in Brazil, South Korea and India, two studies were carried out in each country; and only one study in China. In terms of methodological design, all of them had a quantitative approach, with the majority being cross-sectional studies (n=6) and only one ecological study - Park J, 202312 (Chart 1).

**Chart 1 - Characterization** of the studies included in the review according to author, year, country, type of study, sample and main results (n=07). João Pessoa, PB, Brazil, 2024.

Author, year, country	Type of study	Study sample	Main results:
Bala et al., 2020, India	Cross-sectional study	63 people ≥60 years old	People with a BMI>30 kg/m2 are 3.32 times more likely to develop knee OA among older people. - A sedentary lifestyle increases the chances of OA by 36.7 times.

Franco et al, 2020, SP, Brazil	Cross-sectional study	416 people $\geq 60$ years	There was a significant association between waist circumference (WC) and OA, with 1 centimeter of WC increasing the chance of OA by 3.5 times.
Park, J, 2023, South Korea	Ecological study	5811 people $\geq 60$ years old	Obesity was significantly associated with an increased risk of OA in the elderly population (1.73 in women and 2.76 in men) after adjusting for potential confounding factors.
Sundaram et al, 2023, India	Cross-sectional study	415 people $\geq 65$ years	Participants living in rural areas had a higher risk of developing OA compared to the urban population (28.1%). Participants who were overweight or obese had a higher risk of OA (44% and 44.9%, respectively).
Ji et al., 2023, China	Cross-sectional study	3924 people <55 to $\geq 75$ years old	The risk of developing OAJ is higher among people aged 55-64 (OR 2.913), 65-74 (OR 2.784) and over 75 (OR 3.439) compared to people under 55. The risk of OAJ is 1.509 and 2.235 times higher in overweight and obese participants, respectively. In relation to sleep, the risk of OAJ is 1.677 times higher with average sleep quality and 1.978 times higher in those with poor sleep quality
Lee et al, 2024, South Korea	Cross-sectional study	1260 people $\geq 60$ years	The risk of developing knee OAJ increased with age, 2.67 times higher in those aged 60 and 6.38 times higher in those aged 70 and over, compared to those aged 50 and over. The risk was 1.760 times higher among people with a low level of education. It was 1.591 higher in overweight people and 3.717 in obese people.
Ferrari et al, 2024, PR, Brazil	Cross-sectional study	79 elderly people $\geq 60$ years	Elderly women with a BMI of 29.78 kg/m <sup>2</sup> have a higher risk of developing knee osteoarthritis.

Source: Authors(2024)

Legend: BMI= Body Mass Index; OA: Osteoarthritis; OAJ: Knee Osteoarthritis; OR: Odds Ration

With regard to the modifiable risk factors related to the development of knee and/or hip osteoarthritis among the elderly people covered in the selected studies, the following stand out: overweight and obesity (5 articles); and the other factors such as sedentary lifestyle, increased waist circumference, impaired sleep, living in urban areas compared to rural areas and low schooling, which were reported once in each study in this review (Chart 1).

## DISCUSSION

One of the most prevalent rheumatic diseases is osteoarthritis (OA), described as being degenerative and chronic, characterized by wear and tear of individual articular cartilage. The incidence is higher in heavy joints, such as the knee and hip, and with advancing age the chance of developing OA increases considerably, especially in the elderly population.<sup>15</sup> This prompted the development of this review focusing on modifiable risk factors related to the development of OA among the elderly, which could help people delay or even avoid the onset

of these diseases by adopting preventive measures throughout life.

In the results of this review, most of the modified risk factors related to the development of OA in older people were related to overweight and/or obesity, such as high BMI, sedentary lifestyle and increased waist circumference. This corroborates the results of a systematic review published in 2015<sup>16</sup> which already pointed to age, gender, obesity, metabolic diseases, osteoporosis, genetic factors and joint injuries. And a more recent one (2023)<sup>17</sup>, which highlights that long-term overweight or obesity can result in muscle loss and fat accumulation, leading to the release of inflammatory factors that increase knee pressure or alter the biomechanics of the knee joint, inducing OA, and also showed that maintaining a lighter body weight for a period of 10 years can reduce the risk of OA by 27.5%.

Excess weight can increase stress on the joints, leading to greater pain, stiffness and muscle wastage. For hip structures, the pain can start in the groin or buttock area, radiate to the inner thigh or knee, and if the disease is more advanced, the pain will cause some difficulty in movement. This condition increases the risk of OA due to the overload on the joints.<sup>18</sup>

It's worth noting that being overweight or obese also tends to aggravate the clinical condition of OA, which can be mitigated by eating properly and practicing regular physical activity.<sup>19</sup> Therefore, it is highly recommended that patients control their weight to prevent the occurrence of OA.<sup>17</sup> And, according to the Brazilian Society of Rheumatology, it is essential to maintain weight within normal limits to prevent OA. And in cases where weight loss is already established, it is a very important indication for treatment, emphasizing that no matter how small the reduction, there will always be a benefit.<sup>20</sup> This was ratified by the American College of Rheumatology in 2019.<sup>21</sup>

Individuals with knee and hip OA have limitations due to pain and decreased physical function. The literature points out that physical activity can be considered a useful and effective option for the rehabilitation of this population.<sup>22</sup> Educational measures based on lifestyle changes, including diet and exercise, and joint protection techniques are important for treating and preventing OA. The Osteoarthritis Research Society International (OARSI) guidelines for the treatment and management of OA of the knee, hip and multiple joints define non-pharmacological measures as primary strategies, such as education about the disease, muscle-strengthening exercise programs, aerobic and mind-body exercises, combined with exercise, mental focus and breath control to improve strength, balance and flexibility. In addition, a controlled diet is recommended for weight control.<sup>23</sup>

Physical activity offers several health benefits, including joint remodeling, muscle strengthening and weight control. Recreational or moderate-intensity activity is a protective factor for osteoarthritis. And, studies have shown that weight loss can improve joint pain and function and reduce inflammatory processes. The literature estimates that losing 5 kg of body weight can reduce the risk of developing osteoarthritis by 50%.<sup>24</sup>

Another risk factor worth highlighting is sleep, described in the study by Ji et al (2023)<sup>14</sup> carried out in China, which revealed an increased risk of between 1.6 and 1.9. However, evidence suggests that this condition is linked to the interrelationship between sleep and pain, given that the prevalence of nocturnal knee pain and sleep-related problems increases the severity of OA, affecting patients' quality of life, with frequent reports of sleep complaints among this group. However, studies examining the relationship between sleep quality and symptoms in patients with OAJ are limited and longitudinal studies are lacking, requiring more research to assess the relationship between sleep and OA.<sup>14,25</sup>

This article highlights the importance of increasing the familiarity of health professionals with the modifiable variables that interfere with osteoarthritis, with a consequent increase in health costs and quality of life for the elderly. Identifying these factors can help preventive measures to be adopted earlier and in a more targeted manner.

In addition, the study's limitations include the need to produce more studies on modifiable factors among the elderly, especially longitudinal studies, given the increase in longevity and the impact that knowledge of these factors can have on preventive measures and health promotion among this group.

## CONCLUSION

The studies highlighted overweight and/or obesity as a major modifiable risk factor for the development of knee and hip osteoarthritis among the elderly, including factors associated with this such as high BMI, a sedentary lifestyle and an increased waist circumference.

Sleep was also mentioned, but more longitudinal studies are needed to explain this relationship. Therefore, the studies emphasized the need to invest in weight control and weight loss to prevent OA among the elderly. Future research is suggested to more robustly explore the relationship between other modifiable risk factors related to OA among the elderly, in order to better guide clinical practice and public policies aimed at healthy and active ageing.

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