# UPDATED RECOMMENDATIONS FOR PHYSICAL ACTIVITY AND NON-PHARMACOLOGICAL TREATMENT IN PATIENTS WITH OSTEOARTHRITIS

**V. Terzieva[1], Vl. Boyadzhieva[1,2], M. Ivanova[1,2], N. Stoilov[1,2]**

[1]Rheumatology Clinic, University Hospital „Sv. Ivan Rilski" – Sofia, Bulgaria
[2]Department of Internal Medicine, Medical Faculty, Medical University – Sofia, Bulgaria

***Abstract.*** *Osteoarthritis is a disease with significant social impact, which greatly reduces the quality of life. Treatment involves a comprehensive therapeutic program, a combination of non-pharmacological and pharmacological interventions. Non-pharmacological treatment is essential for reducing pain and improving the functional capacity of the musculoskeletal system. After the publication of the EULAR recommendations for non-pharmacological treatment of osteoarthritis of the hip and knee joints in 2013, many studies were presented regarding the effectiveness of the main non-pharmacological treatment methods and new aspects of their application and monitoring. This highlights the need for their updating, which was done in 2018 and 2023. Additionally, due to the exceptional importance of physical activity and new publications, including the new WHO guidelines for physical activity and sedentary lifestyles, as well as the application of various technologies and apps, there was a need to update the existing recommendations. They are based on numerous clinical studies and have been established as the foundation of treatment for patients with OA. We conducted a systematic review of the scientific literature to present the need for their application in clinical practice.*

***Key words:*** *recommendations, non-pharmacological treatment, physical activity, osteoarthritis*

## Introduction

Osteoarthritis (OA) is a chronic progressive degenerative disease of the articular cartilage, subchondral bone, and surrounding soft tissues, leading to pain, stiffness, and impaired functional capacity [1]. According to the Global Burden of Disease (2023), OA affects over 500 million people worldwide and is the fourth leading cause of disability among adults [2]. It is characterized by the first symptoms appearing in the late 40s to mid-50s, although it can affect younger people, including athletes, those who have sustained injuries or trauma, and individuals exposed to prolonged risk factors in the work environment (vibrations, repetitive movements) [3].

Despite the advance of pharmacotherapy, there is still no drug that leads to a complete cure for the disease. Traditionally, the treatment of OA focuses on controlling symptoms through nonsteroidal anti-inflammatory drugs, chondroprotectors, and intra-articular injections, with endoprosthetic replacement recommended in the later stages of the disease [4]. Publications in the last 15 years have emphasized a comprehensive, multimodal treatment approach, shifting the focus to non-pharmacological therapy as a key component [5]. Education and lifestyle modification have gained critical importance for informed decision-making between the physician and patient [6]. For these reasons, the present review aims to systematize the available evidence and recommendations for physical activity in patients with osteoarthritis.

International professional societies, including the European Alliance of Associations for Rheumatology (EULAR), the American College of Rheumatology (ACR), the Osteoarthritis Research Society International (OARSI), and the European Society for Clinical and Economic Aspects of Osteoporosis/Osteoarthritis and Musculoskeletal Diseases (ESCEO), unanimously recommend physical activity, weight control, and patient education as first-line interventions before considering pharmacological or surgical options [7].

However, practical application remains inconsistent in real clinical practice. Exercise programs are not a major focus, and patients often demonstrate poor adherence due to pain, comorbidities, or limited access to physiotherapy. [8] These inconsistencies highlight the need for an analysis of the latest clinical studies in the field, as well as the increasing number of recommendations published in recent years [9].

## Methods

A systematic review of publications in electronic databases PubMed, Scopus, and Google Scholar was conducted for the period from 1 January 2010

to 1 January 2025. A total of 5,348 articles were identified that matched the keywords "physical activity," "non-pharmacological treatment," "osteoarthritis," and "recommendations." From these, publications were selected according to inclusion and exclusion criteria.

The inclusion criteria were: articles written in English, available in full text;

the articles should be about randomized controlled trials, meta-analyses, systematic reviews, and clinical guidelines;

the articles should be about adult patients with OA of the knee, hip, or wrist joints.

The exclusion criteria were: duplicate publications, review articles without original data, animal studies, conference abstracts, and studies involving combined interventions, including medications.

Out of the initially identified 5,348 publications, 89 met the inclusion criteria and were analyzed in detail.

The updated recommendations for non-pharmacological treatment of osteoarthritis emphasize physical exercises as the foundation of therapy for coxarthrosis and gonarthrosis, as well as for involvement of the hand joints. [10]

The updated EULAR recommendations for non-pharmacological treatment of OA (knee and hip joints) from 2023, the updated EULAR recommendations for non-pharmacological treatment of OA of the hand joints from 2018, the updated EULAR recommendations for physical activity in patients with OA and musculoskeletal diseases (MSDs) from 2018, as well as the ACR recommendations for non-pharmacological treatment of OA from 2019, show a high level of consensus on exercise and physical activity – strongly recommended for all patients; weight reduction – strongly recommended for overweight/obese individuals; education and self-management – essential; additional methods (manual therapy, water exercises, braces) – conditionally recommended; pharmacological therapy – a complement to the non-pharmacological foundation.

The updated 2023 EULAR recommendations for non-pharmacological treatment of OA (knee and hip joints) are structured in two categories, including 2 core principles and 8 evidence-based recommendations. They are based on the principles of:

Biopsychosocial approach (physical and psychological status, daily activities, participation in the work process, and environmental factors)

Shared decision-making.

The recommendations include an individualized, multi-component plan; education that should be in-

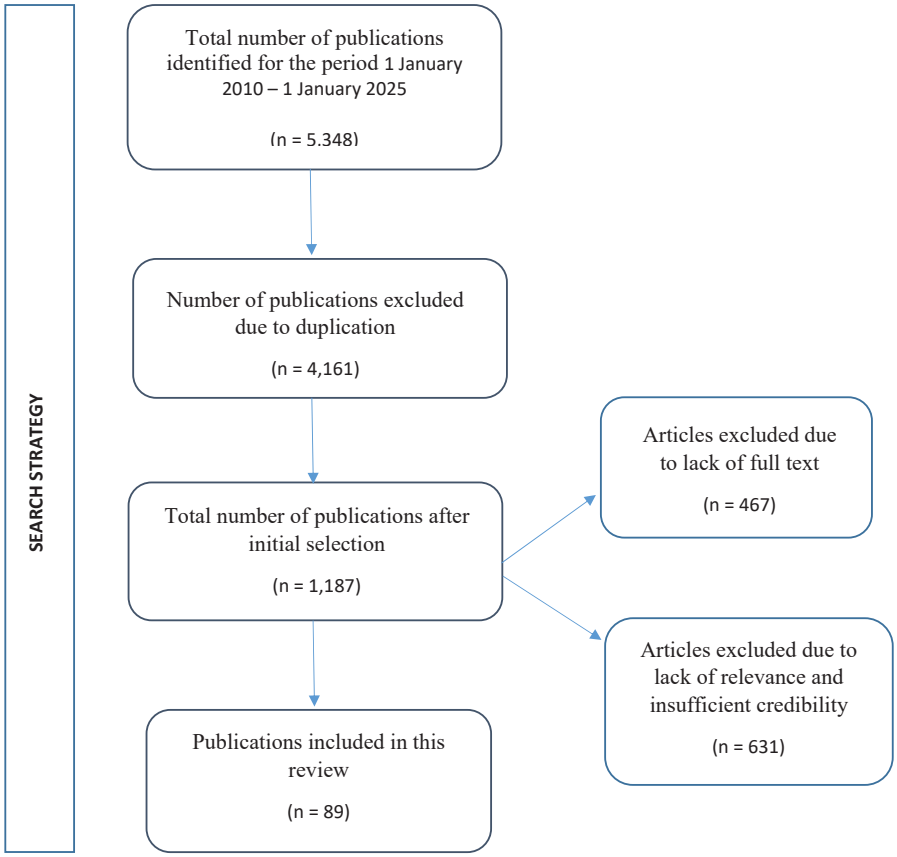



***Fig. 1. Selection of publications according to inclusion and exclusion criteria***

cluded and consistently promoted during each medical visit; an exercise program, individually adapted to each patient; achieving and maintaining a healthy body weight; assistive devices (e.g., orthoses, insoles, knee braces, crutches, etc.); advice on correctable work factors and the use of behavior and lifestyle change techniques when necessary.

The updated 2018 EULAR recommendations for non-pharmacological treatment of OA of the hand joints are based on 5 principles: education, individualized treatment, shared decision-making, multidisciplinary approach, and symptom control, with 10 recommendations, of which 1-3 focus on non-pharmacological treatment (education, exercises, orthoses in rhizarthrosis).

The updated 2018 EULAR recommendations for physical activity in patients with OA and MSDs consider physical activity as an essential part of OA treatment. It is necessary to select individualized exercises based on comorbidities and the condition of each patient. EULAR recommends that rheumatologists guide patients in engaging in evidence-based exercises. The type and amount of physical activity should be tailored to the patient‘s preferences and capabilities. These recommendations include 4 principles (including optimizing quality of life, health benefits, safety for people with MSDs and OA, shared decision-making) [16]. Physiotherapy, kinesitherapy, and balneotherapy are mandatory in the comprehensive treatment of OA. The 10 recommendations include promoting (measuring steps, mobile apps), considering the general and disease-specific contraindications for physical activity (PA) when encouraging PA, personalizing it, identifying barriers related to performing PA, including knowledge, social support, symptom control, and self-regulation, including behavior change techniques, and determining the methods for delivering PA (e.g., controlled/uncontrolled, individual/group, in-person/online, booster strategies) according to people‘s preferences [16].

It has been established that over 50% of men and up to 80% of women with gonarthrosis do not follow physical activity guidelines [17].

According to the consensus on osteoarthritis by the Bulgarian Society of Rheumatology, specific physical activities to strengthen the thigh muscles, combined with low-intensity aerobic exercises, such as walking on flat terrain, remain the best-documented approach to managing gonarthrosis [18].

The 2019 ACR recommendations for non-pharmacological treatment of OA strongly recommend weight reduction (≥ 5% of body weight) for patients with knee and/or hip OA who are overweight or obese. Cognitive-behavioral therapy (CBT) is conditionally recommended for patients with knee, hip, and/or hand OA. Exercises, including aerobic, strengthening, neuromotor, water-based, and mind-body methods (e.g., Tai Chi), are strongly recommended as first-line treatments for all OA patients, regardless of the stage or phenotype of the disease [20].

There is no single type of exercise that is superior – the choice should be individualized based on the patient‘s preferences, access, and comorbidities [21].

A 2025 meta-analysis of 217 randomized controlled trials found that aerobic exercises are likely the most effective method for improving pain, function, gait, and quality of life in gonarthrosis, with moderate evidence certainty [22].

Exercise improves pain, physical function, and quality of life, regardless of disease stage or affected joint. Data from numerous randomized controlled trials show that both aerobic and strengthening exercises lead to clinically significant improvements in pain and function, especially in knee and hip osteoarthritis.

Regarding weight reduction, most guidelines recommend combined dietary and exercise strategies led by multidisciplinary teams, including rheumatologists, physiotherapists, and dietitians. Additional assistive devices, such as knee braces for gonarthrosis and orthoses for OA of the first carpometacarpal joint, are deemed appropriate for certain patients. The use of assistive devices (e.g., canes, crutches, shoe modifications) and orthopedic insoles should be tailored to individual needs and functional limitations [25].

Attention should be given to barriers of adherence to exercise, including access, transport, and preference. Remote and technology-assisted interventions (e.g. telerehabilitation, online apps) are effective and reliable alternatives to in-person programs [26].

Key barriers include limited access to physiotherapy services, low motivation, and misconceptions among patients. Solutions include: telerehabilitation, patient education by physicians, and the use of mobile apps for self-management.

Rheumatologists should play a leading role in integrating evidence-based exercise prescriptions into routine practice and advocate for multidisciplinary care models.

***Table 1. Summary of barriers and facilitating factors for implementation***

| Barrier | Definition | Recommendations for optimization |
|---|---|---|
| Limited access to physiotherapy services | Limitations related to funding, geographical distance and the healthcare system | Introduction of telerehabilitation models, optimization of reimbursement policy |
| Low adherence to exercises | Persistent pain, insufficient motivation | Behaviour change techniques, motivational support, physician reinforcement and self-monitoring tools. |
| Insufficient referral to a doctor | Underestimating clinical effectiveness | Continuing medical education for rheumatologists and general practitioners |
| Comorbidities | Cardiovascular and other clinically significant comorbidities | Individualized programs tailored to comorbidities |
| Misconceptions among patients | "Exercise worsens arthritis“ | Structured educational campaigns with proven effectiveness |

Research priorities for the next decade include:

● Determining the optimal dose of exercise (frequency, intensity, duration) for each joint;

● Developing personalized exercise algorithms that incorporate profiles of comorbidities;

● Evaluating digital health tools for remote monitoring and adherence tracking;

● Conducting implementation trials linking research with primary and community-based healthcare;

● Assessing the cost-effectiveness of complex non-pharmacological interventions.

## Conclusion

Non-pharmacological treatment involves lifestyle changes, with an individualized approach and active patient participation ensuring success.

Current evidence and guidelines recommend physical activity and non-pharmacological treatment as key components of OA management. Future research should clarify the optimal parameters for prescribing exercises to patients and develop strategies to support long-term adherence to this lifestyle. Challenges in the next decade will be related to personalizing programs, integrating digital technologies, and ensuring equal access to services.

In summary, structured exercise and weight reduction form the foundation of non-pharmacological treatment for osteoarthritis. Additional benefits and essential importance are provided by education and selected biomechanical interventions.

## Библиография / References


1. EULAR. EULAR recommendations for the management of osteoarthritis of the hip and knee. Ann Rheum Dis. 2018;77(2):239-248.
2. World Health Organization. WHO Guidelines on Physical Activity and Sedentary Behaviour. Geneva: World Health Organization; 2020.
3. Zhang Y, Jordan JM. Epidemiology of osteoarthritis. Clin Geriatr Med. 2010;26(3):355-369.
4. Global Burden of Disease Collaborative Network. Global burden of disease study 2023 (GBD 2023): Results. Global Burden of Disease Health Metrics; 2023.
5. Lanyon P, Palmisano M, O'Neill T, et al. Osteoarthritis in younger people: clinical and management perspectives. Best Pract Res Clin Rheumatol. 2018;32(4):530-540.
6. Felson DT, Zhang Y, Hannan MT, et al. The effect of obesity on the risk of osteoarthritis in women and men. Am J Epidemiol. 1997;145(3):281-289.
7. Woolf AD, Pfleger B. Burden of major musculoskeletal conditions. Bull World Health Organ. 2003;81(9):646-656.
8. National Institute for Health and Care Excellence (NICE). Osteoarthritis: Care and Management. NICE guideline [CG177]. London: NICE; 2014.
9. American College of Rheumatology (ACR). 2019 ACR/ARHP guidelines for the management of osteoarthritis. Arthritis Rheumatol. 2019;71(9):1422-1433.
10. Brannigan AE, McAuley JH, Robinson HS, et al. Evidence for non-pharmacological treatment of osteoarthritis. Phys Ther Rev. 2014;19(5):358-373.
11. American College of Rheumatology (ACR). Osteoarthritis treatment guidelines: physical activity, weight control, and education. Rheum Dis Clin North Am. 2019;45(1):103-118.
12. National Institutes of Health (NIH). Osteoarthritis: Current Concepts in Management. Bethesda, MD: NIH; 2021.
13. European League Against Rheumatism (EULAR). EULAR recommendations for non-pharmacological management of knee osteoarthritis. Ann Rheum Dis. 2023;82(7):735-743.
14. European League Against Rheumatism (EULAR). EULAR recommendations for non-pharmacological management of hand osteoarthritis. Ann Rheum Dis. 2018;77(10):1434-1442.
15. Glyn-Jones S, Palmer AJ, Agricola R, et al. Osteoarthritis. Lancet. 2015;386(9991):376-387.
16. European League Against Rheumatism (EULAR). Physical activity recommendations in osteoarthritis: a comprehensive approach. Rheumatology. 2018;57(6):991-1000.
17. Williams A, McGaw C, Shaw D, et al. The role of physiotherapy in osteoarthritis treatment: A systematic review. J Clin Rheumatol. 2017;23(4):222-229.
18. Braddock C, Edwards K, Finkelstein J. Informed decision-making in clinical practice: Challenges and solutions. JAMA. 2019;321(5):456-463.
19. O'Neill T, McGowan E, Pemberton S, et al. Low adherence to physical activity guidelines in patients with osteo-

arthritis of the knee: A cross-sectional study. BMJ Open. 2020;10(3):e035344.
20. Bulgarian Rheumatology Society. Consensus on osteoarthritis management: Physical activity and rehabilitation recommendations. Sofia: Bulgarian Rheumatology Society; 2019.
21. Bliddal H, Leeds A, Christensen R. Exercise and weight loss in osteoarthritis management. Nat Rev Rheumatol. 2021;17(3):123-132.
22. Haak T, Zhang Q, Parkinson W, et al. Cognitive-behavioral therapy for patients with osteoarthritis: A meta-analysis of randomized trials. Psychosom Med. 2020;82(8):703-712.
23. Sowers M, Karvonen-Gutierrez C, Albrecht S. Obesity and osteoarthritis: Implications for prevention and management. Rheum Dis Clin North Am. 2018;44(1):97-113.
24. Smith L, Williams S, Campbell D, et al. Aerobic exercise improves pain and function in knee osteoarthritis: A systematic review and meta-analysis. Osteoarthritis Cartilage. 2025;33(1):56-68.
25. Bierma-Zeinstra SMA, Molenaar K, Verhagen A, et al. Exercise interventions for the knee in osteoarthritis: A systematic review. Rheumatology. 2020;59(3):517-527.
26. Weller A, Sullivan E, Cavanagh S, et al. Weight loss strategies for knee osteoarthritis management. J Clin Rheumatol. 2019;25(4):147-154.
27. Sharma L, Kapoor D, D'Agostino M, et al. Joint protection strategies and assistive devices in osteoarthritis management: A practical review. Clin Rheumatol. 2018;37(10):2637-2644.
28. Bassi L, Green H, Turner M. Telehealth and digital tools for osteoarthritis management: A review. J Rheumatol. 2022;49(2):268-276.

*Постъпил за печат: 21.10.2025 г.*

*Submitted: 21.10.2025*

✉ *Адрес за кореспонденция:*
Д-р В. Терзиева
Клиника по ревматология
УМБАЛ „Св. Иван Рилски“
ул. Урвич 13
1612 София

✉ *Correspondence address:*
V. Terzieva, MD
Clinic of Rheumatology
University Hospital “Sv. Ivan Rilski”
13 Urvich str.
Bg – 1612 Sofia