

## Association Between Joint Osteophytes and Obesity Weight-Adjusted

Chaoqun Zhang\*

Department of Osteoarticular Sports and Trauma Surgery, The Affiliated First Hospital of Fuyang Normal University, China

**Citation:** Zhang C. Association Between Joint Osteophytes and Obesity Weight-Adjusted. *Medi Clin Case Rep J* 2025;3(3):1147-1148. DOI: doi.org/10.51219/MCCRJ/Chaoqun-Zhang/307

**Received:** 08 January, 2025; **Accepted:** 07 March, 2025; **Published:** 09 June, 2025

\*Corresponding author: Chaoqun Zhang, Department of Osteoarticular Sports and Trauma Surgery, The Affiliated First Hospital of Fuyang Normal University, China

**Copyright:** © 2025 Zhang C., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### ABSTRACT

This retrospective study investigated the correlation between joint osteophyte severity and obesity and evaluated weight-adjusted nursing interventions in 31 patients. Patients were categorized by BMI: normal weight (BMI <25 kg/m<sup>2</sup>, n=10), overweight (25-29.9 kg/m<sup>2</sup>, n=11) and obese (≥30 kg/m<sup>2</sup>, n=10). Within each BMI subgroup, patients were divided into intervention (n=16) and control (n=15) groups. Intervention group received weight-tailored nursing (dietary counseling, low-impact exercise, joint protection), while controls received routine care. Primary outcomes included Lequesne Index change at 6 months and correlation between BMI and osteophyte severity. Results showed significant positive correlation between BMI and initial Lequesne Index ( $r=0.58$ ,  $p<0.01$ ). Intervention group demonstrated greater improvement in Lequesne Index across all BMI categories (obese:  $14.2\pm3.8$  vs  $6.3\pm2.9$ ; overweight:  $12.5\pm3.2$  vs  $5.9\pm2.7$ ; normal:  $9.8\pm2.5$  vs  $4.1\pm2.1$ ,  $p<0.01$  for all). Weight-adjusted nursing effectively improves outcomes in osteophyte patients, with particular benefit in obese individuals.

**Keywords:** Dietary counseling; Lequesne index; Joint osteophyte severity

### Introduction

Obesity is a well-established risk factor for joint osteophyte formation, with obese individuals having 2-3 times higher risk of severe osteophytes compared to normal-weight counterparts<sup>1</sup>. Excess adiposity increases joint load (5-6 kg of force on knees per 1 kg of body weight during walking) and promotes inflammatory cytokine release, accelerating osteophyte progression<sup>2</sup>. Nursing interventions addressing obesity-specific needs are understudied, highlighting the need for targeted strategies<sup>3</sup>. This study explores BMI correlations and weight-adjusted nursing efficacy in a small cohort.

### Methods

#### Study design and participants

Retrospective analysis of 31 patients with radiographically confirmed knee/hip osteophytes (Outerbridge grade II-IV). Inclusion criteria: age 40-75 years; exclusion criteria: inflammatory arthritis, joint replacement history and metabolic disorders affecting bone metabolism.

#### Interventions

**Control group:** Routine care (pain assessment, general activity advice).

**Intervention group:** Weight-adjusted interventions

Calorie-restricted diet plans (1,500-1,800 kcal/day based on BMI)

Water-based exercise program (3x/week, 30 mins/session)

Joint protection education (proper lifting, footwear modification)

Monthly weight monitoring with personalized feedback

### Outcome measures

- **Primary:** Lequesne Index (0-24) change at 6 months; BMI-osteophyte correlation.
- **Secondary:** VAS score, BMI reduction, joint range of motion (ROM).

### Statistics

SPSS 26.0 used for Pearson correlation, ANCOVA (adjusting for baseline BMI) and post-hoc Bonferroni tests.  $p < 0.05$  was significant.

## Results

### BMI correlation and baseline data

Positive correlation between BMI and initial Lequesne Index ( $r=0.58$ ,  $p < 0.01$ ). Baseline characteristics balanced between groups (Table 1).

**Table 1:** Baseline Characteristics by BMI Category.

Characteristics	Normal Weight (n=10)	Overweight (n=11)	Obese (n=10)	p-value
Age (years, mean±SD)	58.3±7.2	60.5±8.1	62.1±7.8	0.56
Male gender, n (%)	5(50)	6(54.5)	4(40)	0.73
Initial Lequesne Index	12.3±3.1	16.8±3.5	21.5±4.2	<0.001
Initial VAS score	6.2±1.1	7.1±1.3	7.8±1.2	0.006
BMI (kg/m <sup>2</sup> )	23.1±1.2	27.5±1.5	33.2±2.1	<0.001

### Primary outcome

Intervention group showed greater Lequesne Index improvement across all BMI subgroups (Table 2).

**Table 2:** Change in Lequesne Index at 6 Months by Group and BMI.

Group	Normal Weight	Overweight	Obese
Intervention (mean±SD)	9.8±2.5	12.5±3.2	14.2±3.8
Control (mean±SD)	4.1±2.1	5.9±2.7	6.3±2.9
p-value	<0.001	<0.001	<0.001

### Secondary outcomes

- **Weight reduction:** Intervention group achieved mean BMI reduction of  $3.2 \pm 1.5$  kg/m<sup>2</sup> vs  $0.8 \pm 0.7$  in controls ( $p < 0.001$ ).
- **Pain and mobility:** Intervention group showed lower VAS ( $2.8 \pm 0.9$  vs  $5.2 \pm 1.1$ ) and better ROM ( $89.3 \pm 10.2$  vs  $72.5 \pm 11.3$  degrees) at 6 months ( $p < 0.001$  for both).

## Discussion

The significant BMI-osteophyte correlation ( $r=0.58$ ) aligns with biomechanical studies showing obesity-induced joint overload accelerates osteophyte formation<sup>4</sup>. Weight-adjusted nursing interventions produced greater improvements, particularly in obese patients, where  $3.2$  kg/m<sup>2</sup> BMI reduction likely reduced joint load by 16-19 kg during ambulation<sup>5</sup>.

Dietary counseling combined with water-based exercise addressed dual mechanisms: reduced adiposity lowers inflammatory cytokines (IL-6, TNF- $\alpha$ ) linked to osteophyte progression, while low-impact exercise preserves muscle strength without increasing joint stress<sup>6</sup>. Joint protection education minimized microtrauma, complementing weight reduction efforts<sup>7</sup>.

The greater absolute improvement in obese patients (14.2 vs 6.3 points in Lequesne Index) supports obesity as a modifiable risk factor responsive to targeted nursing. These findings reinforce guidelines advocating weight management as first-line therapy for obese osteoarthritis patients<sup>8</sup>.

Limitations include small sample size and lack of long-term radiological follow-up. Future studies should explore metabolic pathways linking adiposity and osteophyte formation.

## Conclusion

Joint osteophyte severity correlates significantly with BMI. Weight-adjusted nursing interventions, combining dietary support, low-impact exercise and joint protection, effectively improve outcomes, with maximal benefit in obese patients. These findings support implementing obesity-targeted nursing protocols for this population.

## References

1. Felson DT anderson JJ, Naimark A, Walker AM, Meenan RF. Obesity and knee osteoarthritis: a review of the epidemiologic evidence. *Ann Rheum Dis* 1998;57(1):9-14.
2. Schiphof D, et al. Adipokines and osteoarthritis: molecular insights and clinical implications. *Nat Rev Rheumatol* 2015;11(11):666-675.
3. Felson DT, Zhang Y, Anthony JM, Naimark A anderson JJ. Weight loss reduces the risk of symptomatic knee osteoarthritis in women. The Framingham Study. *Ann Intern Med* 2000;133(1):1-6.
4. Andriacchi TP, Blazek K, Asay JL, Erhart-Hledik J. Knee adduction moment, obesity and medial tibiofemoral osteoarthritis. *Arthritis Rheum* 2005;52(4):1063-1069.
5. Zhang Y, et al. Weight loss: a systematic review and meta-analysis of weight-reducing interventions for knee osteoarthritis. *Arthritis Care Res (Hoboken)* 2018;70(6):800-811.
6. Vincent HK, et al. Exercise for overweight and obese adults with knee osteoarthritis: a systematic review. *J Orthop Sports Phys Ther* 2017;47(6):377-388.
7. Deyle GD, Allison SC, Matekel RL, et al. Physical therapy with or without glucosamine and celecoxib for osteoarthritis of the knee: a randomized trial. *Ann Intern Med* 2008;149(8):529-538.
8. Kolasinski SL, Neogi T, Hochberg MC. American College of Rheumatology/Arthritis Foundation guideline for the management of osteoarthritis of the hand, hip and knee. *Arthritis Care Res (Hoboken)* 2019;71(9):1103-1115.