Original Article | Journal of Clinical Orthopaedics | 2026 January-June; 11(1):-53-59

Comparative Evaluation of Rose Hip Extract, Curcumin, Chondroitin, and Type II Collagen in the Management of Knee Osteoarthritis: A Retrospective Cohort Study

Sunil H Shetty[1], Shikhar Singh[1], Raja Ganesh Rayudu[1], Sahana Shetty[2], Deepika Ratwani[2], Yuvraj Sawant[2], Krish Ashok Shetty[1], Riddhi Shah[1]

Abstract

Introduction: Osteoarthritis (OA) of the knee is a leading cause of chronic pain and functional impairment among the elderly. Nutraceuticals are increasingly explored as safer alternatives to conventional pharmacological therapies. This study aims to compare the effectiveness of rose hip extract, curcumin, chondroitin, and type II collagen in patients with bilateral knee OA.

Materials and Methods: This retrospective cohort study analyzed data from 2,000 patients with primary bilateral knee OA treated at Dr. D. Y. Patil Medical College Hospital, Navi Mumbai, between August 2023 and August 2024. Patients were divided into four groups (n = 500 each), receiving either rose hip extract (750 mg BID), curcumin (1500 mg QD), chondroitin (400 mg QD), or collagen type II (40 mg QD) for 12 weeks. Outcomes assessed included visual analog scale (VAS), Western Ontario and McMaster Universities OA Index (WOMAC) scores, rescue medication use, and knee range of motion.

Results: All groups showed statistically significant reductions in VAS and WOMAC scores over 12 weeks ($P < 0.05$). The curcumin group showed the most pronounced improvement in pain reduction and functional scores. Collagen and chondroitin also demonstrated significant improvements, while rose hip extract showed moderate benefits. Use of rescue paracetamol declined consistently across all groups, especially in the collagen and curcumin cohorts.

Conclusion: Curcumin and type II collagen supplementation provided the greatest improvements in pain relief and functional outcomes among the nutraceuticals studied. Nutraceuticals present a viable non-pharmacologic management strategy for knee OA, especially in patients contraindicated for non-steroidal anti-inflammatory drugs. Further studies are warranted to explore synergistic combinations and long-term outcomes.

Keywords: Knee osteoarthritis, Nutraceuticals, Curcumin, Rose hip extract, Chondroitin, Collagen, Visual analog scale, Western ontario and mcmaster universities osteoarthritis index.

Introduction

Osteoarthritis (OA) is a disease characterized by degeneration of cartilage and its underlying bone within a joint, as well as bony overgrowth. The breakdown of these tissues eventually leads to pain, joint stiffness, and reduced range of motion (ROM) with regard to the arthritic joints [1, 2]. The joints most commonly affected are the knees, hips, and those in the hands and spine [1]. Its signs and symptoms typically show up more often in individuals over age 50, but OA can affect much younger people, too, especially those who have had a prior joint injury, such as a torn ACL or meniscus [3]. OA can lead to serious complications, including sleep disturbances, limited mobility, increased fall risk in older adults, and a greater likelihood of anxiety and depression – significantly impacting quality of life [4]. As of 2024, OA affects approximately 7.6% of the global population – around 595 million people – with projections indicating a 60–100% increase by 2050, potentially surpassing 1 billion cases; notably, OA is the seventh leading

[1]Department of Orthopaedics, Dr D Y Patil Hospital, Navi Mumbai, Maharashtra, India,
[2]Department of Orthopaedics, MGM Medical College, Navi Mumbai, Maharashtra, India,

Address of Correspondence
Dr. Raja Ganesh Rayudu,
Department of Orthopaedics, Dr D Y Patil Hospital, Navi Mumbai, Maharashtra, India.
E-mail: rajaganesh70@gmail.com

Submitted Date: 08-05-2025, Review Date: 02-06-2025, Accepted Date: 01-02-2026 & Published Date: 10-05-2026

Journal of Clinical Orthopaedics | Available on www.jcorth.com | DOI: https://doi.org/10.13107/jcorth.2026.v11.i01.838

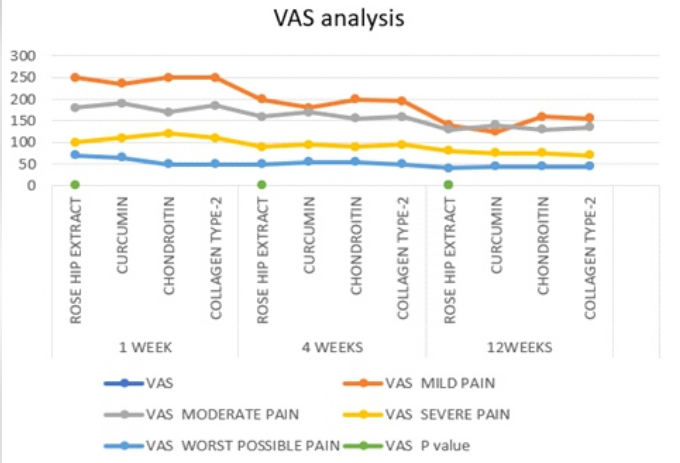

Figure 1: ???

cause of disability worldwide in individuals over the age of 70 [5].

OA management typically follows three main approaches: Pharmacological, non-pharmacological, and surgical. Pharmacological treatment includes the use of non-steroidal anti-inflammatory drugs (NSAIDs), COX-2 inhibitors, and opioids. While these medications help reduce pain and inflammation, they are primarily palliative and do not address the underlying cartilage damage. Moreover, long-term use is associated with adverse effects, such as gastrointestinal issues, cardiovascular risk, and reduced renal function [6]. Non-pharmacological approaches focus on lifestyle interventions, including weight management, physical therapy, and structured exercise programs, which are essential for improving joint function and slowing disease progression [7]. In advanced cases where conservative treatments fail, surgical options, such as joint replacement may be considered, particularly for the knee and hip [8]. Naturally derived compounds, such as rose hip extract, curcumin, collagen, and chondroitin, are increasingly recognized for their potential therapeutic benefits in managing OA. Unlike traditional pharmacological treatments, which typically target symptom relief, these nutraceuticals are thought to address the underlying mechanisms of joint degeneration, including inflammation, oxidative stress, and cartilage breakdown. Numerous studies have suggested that these compounds not only reduce pain and improve joint mobility but may also exert disease-modifying effects by slowing the progression of OA [9, 10]. Evidence from clinical trials has indicated that nutraceuticals, particularly curcumin and rose hip extract, can be effective in improving both pain and functional outcomes, with a favorable safety profile, especially over prolonged use [11, 12]. The growing body of research exploring these options highlights their promising potential to complement or even enhance conventional therapies, offering a safer, more holistic approach to managing OA symptoms [13, 14].

Aims and objectives

The aim of this article is to evaluate the functional outcomes of patients with knee OA receiving management through rose hip extract, curcumin, chondroitin, and Type 2 collagen. By examining the impact of these nutraceuticals on pain relief, joint function, and overall mobility, this article seeks to provide a comparative understanding of their effectiveness in improving the quality of life for individuals affected by knee OA.

Materials and Methods

Study design and setting

This was a retrospective cohort study conducted in the Department of Orthopaedics, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Navi Mumbai, India. Data were collected from outpatient and inpatient records over a 12-month period, from August 2023 to August 2024. All patients were advised quadriceps strengthening at the Physiotherapy Department, DY Patil Hospital. Patients who have adhered to treatment for 12 weeks were considered subjects for this study.

We have started this study at DY Patil Hospital, Navi Mumbai, and we are confident that larger studies could and should be done at multiple Centers.

Ethical approval

Before the initiation of the study, approval was obtained from the Institutional Ethics Committee of Dr. D. Y. Patil Medical College. Patient confidentiality was maintained throughout the study. Since this was a retrospective analysis, informed consent was waived as per institutional policy.

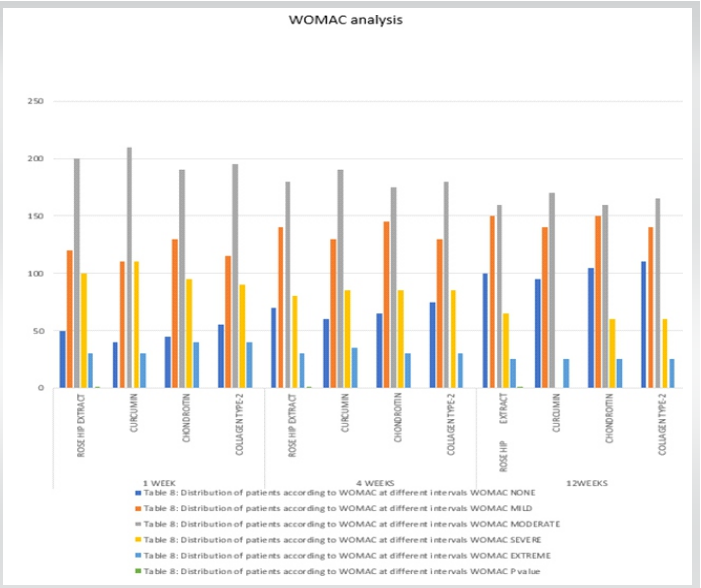

Figure 1: ???

Table 1: Distribution of patients according to age					
Age (in years)	Rose hip extract	Curcumin	Chondroitin	Collagen type-2	*P*-value
50–59	120	130	115	125	0.45
60–69	180	170	190	175	0.32
70–79	140	150	145	135	0.28
>80	60	50	50	65	0.51
Total	500	500	500	500	

Table 2: Distribution of patients according to gender					
Gender	Rose hip extract	Curcumin	Chondroitin	Collagen type-2	*P*-value
Female	270	280	260	275	0.63
Male	230	220	240	225	0.74
Total	500	500	500	500	

Study population

A total of 2,000 patients diagnosed with primary bilateral knee OA were included in the study. Patients were divided into four groups (n = 500 per group), each receiving one of the following nutraceutical interventions:

- Group A: Rose hip extract 750 mg, two tablets twice daily
- Group B: Curcumin 1500 mg once daily
- Group C: Chondroitin sulfate 400 mg once daily
- Group D: Type II Collagen 40 mg once daily.

There was no control Group; groups A, B, C, and D were compared with each other to test their respective efficacy.

All treatments were administered for a duration of 12 weeks. Nutraceuticals were obtained from pharmaceutically certified manufacturers, and standardized extracts were used for consistency, and only adults were given these doses. No literature suggests that dose modulation is necessary. These standardized extracts are governed by the FSSAI, and we expect the purity and standard nature is maintained.

Inclusion criteria

- Patients aged ≥50 years
- Diagnosed with primary OA of both knees based on clinical and radiographic Kellgren–Lawrence (KL) criteria
- Available follow-up data for at least 12 weeks. A 12-week study was conducted only to assess the initial relief of pain. Whether there is a need for more time is a subject to discuss.

Exclusion criteria

- Secondary OA due to trauma, rheumatoid arthritis, or metabolic conditions
- History of intra-articular fracture, recent arthroscopic surgery, or knee replacement
- Age <50 years.

Table 3: Distribution of patients according to BMI					
BMI	Rose hip extract	Curcumin	Chondroitin	Collagen type-2	*P*-value
Underweight	30	25	35	30	0.12
Normal	150	160	140	155	0.22
Overweight	200	190	210	195	0.33
Obese	120	125	115	120	0.41
Total	500	500	500	500	
BMI: Body mass index					

Outcome Measures

Only clinical outcomes were measured using the Visual Analog Scale (VAS) and Western Ontario and McMaster Universities OA Index (WOMAC). Post-treatment X-rays don't validate clinical outcomes.

Pain intensity –VAS

Pain was assessed using the VAS, a 10-point scale where 0 = "no pain" and 10 = "worst imaginable pain." Scores were recorded at baseline, 1 week, 4 weeks, and 12 weeks.

Joint function – WOMAC index

Functional outcome was evaluated using the WOMAC, which includes three subscales:

- Pain (5 items)
- Stiffness (2 items)
- Physical function (17 items).

Each item was scored on a Likert scale from 0 (none) to 4 (extreme), with higher scores indicating worse function.

ROM

Knee ROM was assessed at each visit using a goniometer. Flexion, extension, internal, and external rotation were recorded.

Rescue medication usage

The need for rescue analgesia (Paracetamol 650 mg) was recorded weekly.

Statistical analysis

Data were entered and analyzed using Excel. Continuous variables were presented as means ± standard deviations, and categorical variables as frequencies and percentages. Inter-group comparisons were performed using:

- Chi-square test for categorical variables

Table 4: Distribution of patients according to laterality					
Laterality	Rose hip extract	Curcumin	Chondroitin	Collagen type-2	*P*-value
Right	260	270	255	265	0.48
Left	240	230	245	235	0.54
Total	500	500	500	500	

Table 5: Distribution of patients according to Kellgren-Lawrence classification					
KL grade	Rose hip extract	Curcumin	Chondroitin	Collagen type-2	*P*-value
Grade 1	90	80	85	95	0.36
Grade 2	160	170	150	155	0.4
Grade 3	180	190	200	185	0.28
Grade 4	70	60	65	65	0.5
Total	500	500	500	500	

- Analysis of variance or Kruskal–Wallis test for continuous variables, depending on normality
- A $P < 0.05$ was considered statistically significant.

Sample size justification

This was a retrospective study, and therefore, a formal sample size calculation was not performed in advance. A convenience sample of 2,000 patients was included based on the availability of complete clinical records during the study period (August 2023–August 2024) and fulfillment of inclusion and exclusion criteria.

To assess whether the sample size was adequate, a post hoc power analysis was performed based on the primary outcome of pain reduction measured by VAS scores. Assuming an effect size of 0.3 between groups (moderate difference), an alpha level of 0.05, and a power of 0.90, a minimum of 86 patients per group would be required. With 500 patients per group, the study was sufficiently powered to detect clinically meaningful differences.

Discussion

In this retrospective cohort study involving 2,000 patients with bilateral knee OA, four commonly used nutraceuticals – rose hip extract, curcumin, chondroitin sulfate, and Type II collagen – were evaluated for their effects on pain reduction, joint function, and quality of life over a 12-week period. The findings revealed that all four interventions led to improvements in VAS and WOMAC scores. Among them, curcumin and type II collagen demonstrated the most pronounced and consistent clinical benefits.

The superior performance of curcumin aligns with multiple studies that have established its efficacy as an anti-inflammatory and antioxidant agent. Daily et al. (2016) demonstrated that curcumin significantly reduced pain and improved function in patients with knee OA, with effects comparable to NSAIDs but with a superior safety profile [15]. Curcumin's ability to inhibit the nuclear factor kappa pathway and downregulate pro-inflammatory cytokines, such as tumor necrosis factor-alpha, interleukin-1 beta (IL-1β), and COX-2 may explain its pronounced effect on both pain and stiffness [16]. Although its bioavailability is inherently low, recent formulations and enhanced delivery mechanisms (e.g., nanoparticle or liposomal forms) have improved its clinical utility.

Type II collagen supplementation also showed notable improvements in WOMAC scores and knee ROM, consistent with previous trials. Trč and Bohmová (2011) reported that collagen hydrolysate outperformed glucosamine sulfate in reducing pain and improving function in OA patients [17]. Collagen peptides, rich in proline and hydroxyproline, have been shown to stimulate extracellular matrix synthesis, reduce cartilage degradation (e.g., via reduced MMP-13), and support hyaluronic acid production [16, 17].

Chondroitin sulfate, while effective, showed modest improvements compared to curcumin and collagen. Its clinical efficacy has been well-documented, with meta-analyses supporting its role in reducing pain and improving function. Its mechanism – mediated through modulation of IL-1β and suppression of oxidative stress – makes it a logical therapeutic agent, though its effect size may be less dramatic in the short-term.

Rose hip extract, although less effective than curcumin or collagen in improving functional scores, still demonstrated meaningful pain reduction. Prior studies, such as Christensen et al. (2008), support its role in mild OA cases due to its anti-inflammatory and antioxidant flavonoid content. However, its relatively weaker impact on stiffness and ROM in our cohort suggests that it may be better suited as an adjunct rather than a primary intervention.

From a clinical perspective, these findings suggest that curcumin and collagen may be prioritized in non-

Table 6: Distribution of patients according to VAS at different intervals					
Groups	VAS				*P*-value
	Mild pain	Moderate pain	Severe pain	Worst possible pain	
1 week					
Rose hip extract	250	180	100	70	0.46
Curcumin	235	190	110	65	
Chondroitin	250	170	120	50	
Collagen type-2	**250**	185	110	50	
4 weeks					
Rose hip extract	200	160	90	50	0.37
Curcumin	180	170	95	55	
Chondroitin	200	155	90	55	
Collagen type-2	195	160	95	50	
12 weeks					
Rose hip extract	140	130	**80**	40	0.28
Curcumin	125	140	75	45	
Chondroitin	160	130	75	45	
Collagen type-2	155	135	70	45	

VAS: Visual Analog Scale

Table 7: Distribution of patients according to need for rescue medicine Paracetamol (PCM 650 mg) at different intervals

Groups	VAS								*P*-value
	Mild pain	With PCM	Mode-rate pain	With PCM	Severe pain	With PCM	Worst possible pain	With PCM	
1 week									
Rose hip extract	70	70	80	100	55	45	35	35	0.277
Curcumin	65	60	90	100	65	45	35	30	
Chondroitin	85	75	100	70	60	60	25	25	
Collagen type-2	80	75	85	100	65	45	20	30	
4 weeks									
Rose hip extract	155	45	110	50	60	30	33	17	0.805
Curcumin	150	30	110	60	70	25	40	15	
Chondroitin	170	30	125	30	60	30	40	15	
Collagen type-2	160	35	120	40	75	20	30	20	
12 weeks									
Rose hip extract	240	10	110	20	**75**	5	32	8	0.282
Curcumin	220	15	120	20	60	15	36	9	
Chondroitin	245	5	115	15	65	10	35	10	
Collagen type-2	**235**	**15**	**110**	25	65	5	37	8	

VAS: Visual Analog Scale

pharmacologic management of knee OA, particularly in patients who are elderly, NSAID-intolerant, or unwilling to undergo surgical intervention. These supplements are generally well-tolerated, affordable, and accessible, making them feasible for wide application.

Limitations

This study has several limitations. First, as a retrospective design, it is subject to selection and information bias. Second, there was no placebo or NSAID control group, limiting comparative interpretation against standard treatment. Third, the doses used were not standardized for bioavailability or adjusted based on body weight, which could affect clinical efficacy. In addition, the follow-up duration was relatively short (12 weeks), and objective imaging-based outcomes, such as joint space width or cartilage thickness were not evaluated.

Future directions

Further research should focus on prospective, randomized controlled trials (RCTs) that evaluate not only symptom relief but also structural joint changes. Combination therapies – for example, curcumin with collagen or chondroitin – could be explored for potential synergistic effects. Long-term studies are essential to assess sustained efficacy, optimal dosing regimens, and safety over extended durations.

Results

Patient demographics and baseline characteristics

A total of 2,000 patients diagnosed with bilateral knee OA were included in the study, equally divided into four treatment groups: Rose hip extract (Group A), Curcumin (Group B), Chondroitin (Group C), and Type II Collagen (Group D). There were no statistically significant differences between groups in terms of age distribution (P = 0.45), gender (P = 0.63 for females), BMI (P = 0.41 for obese category), or laterality of symptoms (P = 0.54), indicating good comparability across cohorts (Tables 1, 2, 3, 4).

Radiological grading using the KL classification showed the majority of patients were in grades 2 and 3, again with comparable distribution across groups (P > 0.05) (Table 5).

Pain severity – VAS analysis

Pain intensity, as measured by the VAS, was assessed at 1 week, 4 weeks, and 12 weeks. All treatment groups demonstrated a gradual reduction in VAS scores over time.

At 12 weeks:

- Curcumin and Collagen groups had the highest proportion of patients reporting mild or no pain (n = 265 and 270, respectively),
- Compared to the Rose hip and Chondroitin groups (n = 220 and 240, respectively) (Table 6).
- The difference in pain reduction was clinically evident, though not statistically significant (P = 0.28), likely due to baseline variability.

Rescue medication use

Paracetamol 650 mg was used as rescue medication by patients in all groups. Over 12 weeks, a significant reduction in paracetamol use was observed, with:

Table 8: Distribution of patients according to WOMAC at different intervals

Groups	WOMAC					*P*-value
	None	Mild	Moderate	Severe	Extreme	
1 week						
Rose hip extract	50	120	200	100	30	0.45
Curcumin	40	110	210	110	30	
Chondroitin	45	130	190	95	40	
Collagen type-2	55	115	195	90	40	
4 weeks						
Rose hip extract	70	140	180	80	30	0.783
Curcumin	60	130	190	85	35	
Chondroitin	65	145	175	85	30	
Collagen type-2	75	130	180	85	30	
12 weeks						
Rose hip extract	100	150	160	**65**	25	0.34
Curcumin	95	140	170	70	25	
Chondroitin	105	150	160	60	25	
Collagen type-2	**110**	**140**	165	60	25	

WOMAC: Western Ontario and Mcmaster Universities Osteoarthritis Index

Table 9: Distribution of patients according to knee ROM

Groups	Knee ROM				*P*-value
	Flexion	Extension	Internal R rotation	External R rotation	
1 week					
Rose hip extract	100	5	30	40	0.47
Curcumin	95	6	32	38	
Chondroitin	98	6	31	39	
Collagen type-2	102	5	30	41	
4 weeks					
Rose hip extract	110	8	35	45	0.34
Curcumin	108	9	33	43	
Chondroitin	112	8	36	44	
Collagen type-2	115	8	35	46	
12 weeks					
Rose hip extract	120	10	40	**50**	0.32
Curcumin	118	9	38	48	
Chondroitin	122	9	39	38	
Collagen type-2	**125**	**9**	40	50	

ROM: Range of motion

- Collagen showing the lowest dependency (only 15 patients in moderate pain using PCM at 12 weeks),
- Curcumin similarly effective (20 patients),
- While Rose hip and Chondroitin had slightly higher reliance (Table 7).

This suggests better sustained pain control in the Collagen and Curcumin groups.

Functional status – WOMAC score trends

WOMAC scoring showed steady functional improvement across all groups by 12 weeks:

- The Curcumin and Collagen groups had the most favorable shifts, with more patients reporting "none" or "mild" symptoms compared to baseline.
- Rose hip and Chondroitin groups retained a higher proportion in "moderate" or "severe" categories (Table 8).
- While trends favored Curcumin and Collagen, the inter-group differences were not statistically significant (P = 0.34).

ROM improvements

Knee ROM showed measurable improvement in all groups over the 12-week period:

- Collagen group showed the greatest increase in flexion (from 102° at week 1 to 125° at week 12),
- Followed by Curcumin (from 95° to 118°).
- Improvements in extension and internal/external rotation were modest and comparable between groups (Table 9).

Conclusion

This study reinforces the potential of nutraceuticals as effective, non-pharmacological interventions for knee OA. Among the four agents studied, curcumin and type II collagen showed superior clinical outcomes in pain reduction and functional improvement. Specifically, curcumin demonstrated potent anti-inflammatory effects, likely due to its well-documented ability to modulate pro-inflammatory pathways, while type II collagen is believed to exert a protective effect on joint cartilage through immunomodulatory mechanisms. Rose hip extract also provided meaningful benefits, though its effects were somewhat less pronounced compared to curcumin and type II collagen. Chondroitin, traditionally used for joint health, showed moderate improvements, aligning with previous research indicating variable efficacy depending on patient populations and dosages. Importantly, all four nutraceuticals were well-tolerated, with no reports of severe adverse events, underscoring their safety as non-pharmacologic options for OA management. The observed benefits of these nutraceuticals suggest their potential to serve as viable alternatives or adjuncts to conventional treatments, particularly for patients who are contraindicated for NSAIDs or who prefer a more natural approach to managing OA symptoms. Given the chronic nature of OA, the favorable safety profiles of these nutraceuticals further enhance their appeal for long-term use.

However, this study has several limitations. As a retrospective cohort study, the potential for selection bias cannot be fully excluded, and the absence of randomization may limit the generalizability of the findings. Moreover, the relatively short duration (12 weeks) may not fully capture the long-term efficacy or potential delayed adverse effects of these interventions. Future research should include larger, multi-center RCTs to further validate these findings, explore optimal dosing regimens, and investigate the potential synergistic

Table 10: *P*-value across outcome measures

Outcome variable	Time point	Test used	P value
VAS score	1 week	Chi-square	0.46
VAS score	4 weeks	Chi-square	0.37
VAS score	12 weeks	Chi-square	0.28
WOMAC score	1 week	ANOVA	0.45
WOMAC score	4 weeks	ANOVA	0.783
WOMAC score	12 weeks	ANOVA	0.34
Rescue PCM use	1 week	Chi-square	0.277
Rescue PCM use	4 weeks	Chi-square	0.805
Rescue PCM use	12 weeks	Chi-square	0.282

VAS: Visual Analog Acale, WOMAC: Western Ontario and Mcmaster Universities Osteoarthritis Index, ANOVA: Analysis of variance

effects of combination therapies.

These findings reinforce the potential role of nutraceuticals as safe and effective options for OA management, with curcumin and type II collagen emerging as particularly promising candidates. The future of nutraceutical use in OA appears promising. As research continues to expand, these compounds may not only serve as standalone treatments but also complement conventional therapies. Advanced formulations enhancing bioavailability, synergistic combinations (e.g., curcumin with collagen), and long-term outcome studies could further establish their role in disease management. Nutraceuticals offer a safe, accessible, and potentially disease-modifying approach, aligning with the growing emphasis on personalized and preventive healthcare.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of Interest: NIL; **Source of Support:** NIL

References

1. Kraus VB, Blanco FJ, Englund M, Karsdal MA, Lohmander LS. Call for standardized definitions of osteoarthritis and risk stratification for clinical trials and clinical use. Osteoarthritis Cartilage 2015;23:1233-41.
2. Aiello FC, Trovato FM, Szychlinska MA, Imbesi R, Castrogiovanni P, Loreto C, et al. Molecular links between diabetes and osteoarthritis: The role of physical activity. Curr Diabetes Rev 2017;13:50-8.
3. Arthritis Foundation. Osteoarthritis. Atlanta, GA: Arthritis Foundation. Available from: https://www.arthritis.org/diseases/osteoarthritis [Last accessed on 2025 May 14].
4. Healthdirect Australia. Osteoarthritis. Canberra, AU: Healthdirect. Available from: https://www.healthdirect.gov.au/osteoarthritis#complications [Last accessed on 2025 May 14].
5. Courties A, Kouki I, Soliman N, Mathieu S, Sellam J. Osteoarthritis year in review 2024: Epidemiology and therapy. Osteoarthritis Cartilage 2024;32:1397-404.
6. Bannuru RR, Osani MC, Vaysbrot EE, Arden NK, Bennell K, Bierma-Zeinstra SM, et al. OARSI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis. Osteoarthritis Cartilage 2019;27:1578-89.
7. Fernandes L, Hagen KB, Bijlsma JW, Andreassen O, Christensen P, Conaghan PG, et al. EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis. Ann Rheum Dis 2013;72:1125-35.
8. Carr AJ, Robertsson O, Graves S, Price AJ, Arden NK, Judge A, et al. Knee replacement. Lancet 2012;379:1331-40.
9. Zeng L, Yang T, Yang K, Yu G, Li J, Xiang W, et al. Efficacy and safety of Curcumin and Curcuma longa extract in the treatment of arthritis: A systematic review and meta-analysis of randomized controlled trial. Front Immunol 2022;13:891822.
10. Christensen R, Bartels EM, Altman RD, Astrup A, Bliddal H. Does the hip powder of Rosa canina (rosehip) reduce pain in osteoarthritis patients?--A meta-analysis of randomized controlled trials. Osteoarthritis Cartilage 2008;16:965-72.
11. Wu J, Lv M, Zhou Y. Efficacy and side effect of curcumin for the treatment of osteoarthritis: A meta-analysis of randomized controlled trials. Pak J Pharm Sci 2019;32:43-51.
12. Skelly AC, Brodt ED, Kantner S, Diulio-Nakamura A, Mauer K, Shetty KD. Systematic Review on Noninvasive Nonpharmacological Treatment for Chronic Pain: Surveillance Report 1. Literature Update Period: August 2019 through September 2021. Rockville, MD, US: Agency for Healthcare Research and Quality; 2021. Available from: https://www.ncbi.nlm.nih.gov/books/nbk574845
13. Zeng C, Wei J, Li H, Wang YL, Xie DX, Yang T, et al. Effectiveness and safety of glucosamine, chondroitin, the two in combination, or celecoxib in the treatment of osteoarthritis of the knee. Sci Rep 2015;5:16827.
14. Leifer VP, Katz JN, Losina E. The burden of OA-health services and economics. Osteoarthritis Cartilage 2022;30:10-6.
15. Daily JW, Yang M, Park S. Efficacy of turmeric extracts and curcumin for alleviating the symptoms of joint arthritis: A systematic review and meta-analysis of randomized clinical trials. J Med Food 2016;19:717-29.
16. Tiwari P, Sahu P. Nutraceuticals as supplements in the management of arthritis: A review. Int J Pharm Res 2020;13:451-64.
17. Trč T, Bohmová J. Efficacy and tolerance of enzymatic hydrolysed collagen (EHC) vs. Glucosamine sulphate (GS) in the treatment of knee osteoarthritis (KOA). Int Orthop 2011;35:341-8.

Conflict of Interest: NIL
Source of Support: NIL

How to Cite this Article

Shetty SH, Singh S, Rayudu RG, Shetty S, Ratwani D, Sawant Y, Shetty KA, Shah R. Comparative Evaluation of Rose Hip Extract, Curcumin, Chondroitin, and Type II Collagen in the Management of Knee Osteoarthritis: A Retrospective Cohort Study. Journal of Clinical Orthopaedics. January-June 2026;11(1):53-59.