



Therapeutic Evaluation of Super Joints Tablets (SJT): A Multi-Herbal Nutraceutical Formulation for Managing Joint Degeneration and Inflammation

a* Md. Mahfoozur Rahman, b Raghavendara Kumar Sharma, c Sumbul

^a Department of Pharmacology (Ilmul Advia), Government Tibbi College and Hospital, Patna, Bihar.

^b Department of Neurosurgery, All India Institute of Medical Sciences (AIIMS) Jodhpur, Rajasthan.

^c Department of Obstetrics and Gynaecology, School of Unani Medical Education and Research (SUMER), Jamia Hamdard, New Delhi.

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*For Correspondence:

Professor (Dr.) Md. Mahfoozur Rahman, HoD, Department of Pharmacology (Ilmul Advia), & Principal Government Tibbi College and Hospital, Patna, Bihar, India

Abstract

Super Joints Tablets (SJT), developed by ManahVeda™ is a multi-nutrient and multi-herbal nutraceutical formulation designed to support joint integrity, reduce inflammatory responses, and enhance overall musculoskeletal function. It contains Glucosamine Hydrochloride, *Withania somnifera* (Ashwagandha) root extract, *Trigonella foenum-graecum* seed extract (standardized to saponins), *Boswellia serrata* extract (standardized to boswellic acid), Rosa canina (Rosehip) extract, *Curcuma longa* extract (standardized to curcumin), *Alpinia galanga* (Rasna) extract, and *Piper nigrum* extract standardized to piperine. These ingredients collectively target inflammatory pathways, oxidative damage, cartilage degeneration, and neuromuscular stress-primary contributors to osteoarthritis and chronic joint disorders. Glucosamine plays a structural role in cartilage formation, while Boswellia, Curcumin, and Rosehip exhibit potent anti-inflammatory and antioxidant effects. Ashwagandha contributes adaptogenic and stress-modulating effects, Fenugreek adds metabolic and analgesic support, and Rasna offers classical musculoskeletal benefits rooted in Ayurvedic medicine. Piperine enhances the bioavailability of co-administered phytochemicals, especially curcumin. This article evaluates the therapeutic potential of the formulation using available scientific literature, establishing a mechanistic rationale for its synergistic activity. The multi-target benefits of Super Joints Tablet position it as a promising adjunct approach for individuals experiencing osteoarthritis, inflammatory joint conditions, age-related musculoskeletal decline, and mobility limitations. The scientific foundation of the ingredients indicates that the formulation may reduce pain, improve joint lubrication, enhance flexibility, and slow degenerative processes. Further clinical investigation is warranted to validate long-term outcomes, optimal dosing strategies, and comparative efficacy with conventional therapies. Overall, Super Joints Tablet demonstrates potential as a holistic nutraceutical intervention for joint support, inflammation control, and improved quality of life.

Keywords: Joint Integrity Support; Anti-Inflammatory Nutraceuticals; Cartilage Protection; Ayurvedic Multi-Herbal Formulation; Osteoarthritis Management

Introduction

Joint disorders, including osteoarthritis, rheumatoid arthritis, and age-related degenerative conditions, constitute one of the most significant global health burdens in modern society¹. As populations age, lifestyles become increasingly sedentary, and rates of obesity and metabolic syndrome continue to rise, the incidence and prevalence of joint-related morbidity have grown substantially². Osteoarthritis (OA), the most common form of arthritis, affects more than 300 million individuals worldwide, creating a profound impact on quality of life, functional mobility, and economic productivity³. Conventional therapies, such as non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids, and synthetic disease-modifying agents, often provide symptomatic relief but are associated with significant gastrointestinal, cardiovascular, renal, and systemic side effects, particularly with long-term use⁴. As

a result, the search for safer, natural, and holistic therapeutic alternatives has intensified⁵.

Nutraceutical formulations have emerged as an increasingly valuable category of complementary therapy in managing musculoskeletal disorders⁶. The term “nutraceutical” encompasses bioactive compounds derived from natural sources that offer therapeutic and preventive benefits beyond basic nutrition⁷. These formulations provide a unique intersection between modern pharmacology and traditional medicinal systems, especially Ayurveda, which has historically utilized herbs for joint-related ailments⁸. Unlike single-agent pharmaceuticals, multi-herbal and multi-nutrient nutraceuticals offer a synergistic approach by targeting multiple pathological pathways simultaneously—such as inflammation, oxidative stress, immune dysregulation, cartilage degeneration, synovial fibrosis, and neuromuscular imbalance⁹.

Super Joint Tablet, a multi-ingredient nutraceutical product, is designed to address these multifactorial pathologies in joint diseases¹⁰. The formulation integrates widely researched ingredients like glucosamine, boswellic acids, curcumin, piperine, Ashwagandha, Fenugreek, Rosehip, and Rasna, each of which has been individually studied for anti-inflammatory, analgesic, antioxidant, or cartilage-protective effects¹¹. The ability of this formulation to address both structural and functional aspects of joint degeneration distinguishes it from conventional therapies that often treat only symptom relief without addressing underlying tissue changes¹².

The structure-function relationship in joint physiology is central to understanding therapeutic targets¹³. Articular cartilage, composed primarily of type II collagen, proteoglycans, chondrocytes, and extracellular matrix components, provides low-friction articulation and shock absorption¹⁴. In osteoarthritis and other degenerative joint disorders, matrix degradation exceeds matrix synthesis, resulting in progressive cartilage thinning, subchondral bone remodeling, synovial inflammation, and osteophyte formation¹⁵. Glucosamine, a fundamental component of glycosaminoglycans and proteoglycans, is included in the Super Joints formulation for its well-established role in cartilage matrix synthesis and chondroprotection¹⁶.

Inflammation plays a central pathogenic role in joint degeneration¹⁷. Pro-inflammatory cytokines such as TNF- α , IL-1 β , and IL-6 activate destructive enzymes including matrix metalloproteinases (MMPs), COX-2, and lipoxygenase pathways¹⁸. *Boswellia serrata* extract, standardized to boswellic acids, has been shown to inhibit 5-lipoxygenase (5-LOX), a key enzyme in leukotriene synthesis, thereby reducing chronic inflammation¹⁹. Similarly, curcumin, a highly potent anti-inflammatory compound, suppresses the NF- κ B signaling pathway, which regulates inflammatory gene expression. Turmeric extract standardized to 95% curcumin ensures pharmacological consistency and potency²⁰.

Oxidative stress further contributes to joint degeneration by damaging synovial membranes, extracellular matrix proteins, and chondrocytes²¹. Rosehip extract, rich in vitamin C and polyphenols, demonstrates significant antioxidant effects and has been studied for its potential to reduce pain and improve mobility in osteoarthritis patients²². Fenugreek seed extract, standardized to saponins, contributes both antioxidant and metabolic benefits, especially for patients with comorbidities such as diabetes and obesity—conditions that worsen systemic inflammation and joint health²³.

Neuromuscular and psychosomatic factors are increasingly recognized as contributors to chronic joint pain. Stress-induced cortisol elevation enhances systemic inflammation, increases muscle tension, and impairs pain tolerance. Ashwagandha (*Withania somnifera*), a classical adaptogenic herb, plays an essential role in modulating the hypothalamic–pituitary–adrenal (HPA) axis, reducing stress-induced inflammation, and supporting muscle strength and nerve

function²⁴. These effects are especially important in patients with chronic pain syndromes where stress and inflammation perpetuate one another.

Rasna (*Alpinia galanga*), a renowned musculoskeletal herb in Ayurveda, has been used for centuries to treat *Sandhivāta*, *Āmavāta*, and *Vātavyādhi*-conditions that correlate with modern concepts of arthritis, inflammation, and degenerative disorders. Rasna exhibits analgesic, anti-inflammatory, and anti-rheumatic activity, complementing other herbs in the formulation²⁵.

Bioavailability remains a critical challenge in herbal formulations, especially concerning curcumin, which exhibits poor absorption, rapid metabolism, and limited systemic bioavailability. Piperine, derived from black pepper, is included in the formulation to overcome this challenge. Piperine increases the bioavailability of curcumin by inhibiting glucuronidation in the liver and enhancing gastrointestinal absorption. It also supports digestive fire (*agni*) in Ayurvedic terms, improving assimilation of nutrients.

SJT represents a modern, integrative approach that merges nutraceutical science with the holistic wisdom of traditional medicine. Each ingredient contributes a unique therapeutic action, while their combination results in synergistic benefits that may exceed the sum of individual effects. As joint disorders require multi-dimensional treatment approaches, a formulation like SJT aligns well with contemporary understanding of disease pathology.

This article critically examines the scientific and pharmacological basis of the formulation. The following sections explore the formulation details, mechanistic pathways, therapeutic potential, and discussion of findings based on existing literature.

About the formulation

Super Joints Tablet has been thoughtfully designed as a comprehensive nutraceutical intervention for joint health. The formulation combines structural nutrients, potent anti-inflammatory herbs, adaptogens, antioxidants, and bioavailability enhancers in clinically relevant quantities. Each ingredient has been selected based on scientific evidence, traditional usage, and potential synergy with other components of the formulation²⁶.

Glucosamine Hydrochloride (750 mg)

Glucosamine Hydrochloride (750 mg) is a natural amino sugar essential for synthesizing glycosaminoglycans, the structural components of cartilage²⁷. Supplementation helps maintain cartilage integrity, enhances joint lubrication, and slows degenerative processes. Due to its proven role in supporting cartilage repair and reducing wear-and-tear-related damage, glucosamine remains a foundational ingredient in most evidence-based joint-health formulations²⁸.

Withania somnifera Root Extract (250 mg)

Withania somnifera (Ashwagandha) root extract (250 mg) exhibits notable adaptogenic and anti-inflammatory

properties²⁹. It regulates cortisol levels, enhances neuromuscular strength, and improves resilience against stress-induced inflammatory responses. These mechanisms are especially valuable in chronic joint pain, where psychological stress, inflammation, and neuromuscular dysfunction interact to sustain symptoms and impair functional mobility³⁰.

***Trigonella foenum-graecum* Seed Extract (100 mg)**

Trigonella foenum-graecum seed extract (100 mg), rich in saponins, exhibits notable antioxidant, anti-inflammatory, and anti-diabetic activities³¹. These bioactive compounds help reduce joint stiffness, modulate inflammatory pathways, and improve metabolic parameters. The extract is particularly beneficial for individuals with obesity or metabolic syndrome, conditions that contribute to systemic inflammation and exacerbate joint degeneration³².

***Boswellia Serrata* Extract (100 mg)**

Boswellia serrata extract (100 mg) is a well-established botanical agent for osteoarthritis management³³. Its active boswellic acids inhibit 5-lipoxygenase, thereby reducing leukotriene-mediated inflammatory pathways implicated in joint degeneration. Standardized extract ensures consistent pharmacological activity, contributing to reduced pain, improved mobility, and enhanced anti-inflammatory support within nutraceutical formulations³⁴.

***Rosa canina* Extract (75 mg)**

Rosa canina (Rosehip) extract (75 mg) is rich in vitamin C, galactolipids, and polyphenolic compounds that exhibit strong antioxidant and anti-inflammatory properties³⁵. Evidence from clinical studies indicates that Rosehip supplementation can reduce pain intensity, improve joint mobility, and enhance functional outcomes in individuals with osteoarthritis³⁶, making it a valuable component of joint-support nutraceutical formulations.

***Curcuma longa* Extract (50 mg)**

Curcuma longa extract (50 mg) provides curcumin, a well-established anti-inflammatory phytochemical known to modulate key molecular pathways including NF- κ B activation, COX-2 expression, and pro-inflammatory cytokine release³⁷. Its standardized composition ensures consistent pharmacological potency, contributing to reduced oxidative stress, improved joint function, and enhanced therapeutic efficacy within multi-herbal nutraceutical formulations³⁸.

***Alpinia galanga* Extract (50 mg)**

Alpinia galanga extract (Rasna, 50 mg) is a classical Ayurvedic herb valued for its analgesic, anti-inflammatory, and anti-rheumatic properties³⁹. It helps reduce joint pain, stiffness, and localized inflammation while supporting musculoskeletal strength and functional mobility. Its bioactive constituents contribute to improved joint performance and complement other therapeutic agents in managing degenerative and inflammatory joint conditions.

***Piper nigrum* Extract (1.5 mg)**

Piper nigrum extract (1.5 mg), standardized to 95% piperine, functions as a potent bioavailability enhancer within the formulation⁴⁰. Piperine improves gastrointestinal absorption and systemic availability of curcumin and other co-administered phytochemicals by inhibiting metabolic degradation pathways. Its inclusion significantly amplifies the overall therapeutic efficacy of the multi-herbal nutraceutical formulation.

Together, Super Joints Tablets (SJT) is constructed to address pain, inflammation, cartilage degeneration, oxidative damage, synovial inflammation, and stress-related flare-ups, offering a multi-targeted approach to joint wellness.

Mechanism of action

The therapeutic effectiveness of Super Joints Tablets arises from the multi-layered mechanisms of each ingredient. Joint disorders involve complex pathological processes; hence, a synergistic multi-target mechanism is highly beneficial.

Structural Regeneration:

Glucosamine plays a pivotal role in structural regeneration by promoting the synthesis of proteoglycans and glycosaminoglycans, critical components of the cartilage extracellular matrix⁴¹. Additionally, it inhibits catabolic enzymes such as matrix metalloproteinases (MMPs), reducing cartilage degradation and preserving joint integrity⁴². This dual action supports cartilage maintenance and slows the progression of degenerative joint disorders.

Inhibition of COX and LOX Pathways:

Boswellic acids from *Boswellia* inhibit 5-lipoxygenase (5-LOX), reducing leukotriene-mediated chronic inflammation⁴³. Curcumin suppresses cyclooxygenase-2 (COX-2) activity and inhibits NF- κ B signaling, leading to decreased pro-inflammatory cytokines such as IL-6 and TNF- α ⁴⁴. Together, these compounds modulate key inflammatory pathways, providing synergistic anti-inflammatory effects that support joint health and reduce pain and tissue damage⁴⁵.

Antioxidant Defense:

Rosehip and Fenugreek provide antioxidant defense by neutralizing reactive oxygen species that contribute to cartilage, synovial, and subchondral bone damage⁴⁶. Rosehip's galactolipids exhibit documented chondroprotective properties, reducing oxidative stress and supporting joint structural integrity⁴⁷. Fenugreek further enhances antioxidant activity, contributing to overall musculoskeletal protection and mitigating inflammation-mediated tissue degradation⁴⁸.

Stress Modulation:

Withania somnifera (Ashwagandha) modulates the hypothalamic-pituitary-adrenal (HPA) axis, reducing elevated cortisol levels that contribute to chronic inflammation and muscle tension⁴⁹. By regulating stress responses, Ashwagandha promotes neuromuscular relaxation, enhances pain tolerance, and supports overall

musculoskeletal health⁵⁰, making it a valuable component in managing chronic joint discomfort and inflammation-related disorders.

Musculoskeletal Support:

Rasna improves joint mobility by enhancing synovial fluid quality and reducing local inflammation⁵¹. Its analgesic and anti-rheumatic properties synergize with modern therapeutic agents, promoting pain relief and musculoskeletal function⁵². By supporting structural integrity and mitigating inflammatory processes, Rasna serves as a valuable adjunct in maintaining joint health and improving overall musculoskeletal performance⁵³.

Bioavailability Enhancement:

Piperine significantly enhances curcumin absorption and systemic availability by inhibiting hepatic and intestinal glucuronidation⁵⁴. Additionally, it improves digestive efficiency, facilitating better nutrient assimilation and metabolic utilization⁵⁵. This synergistic interaction makes curcumin more effective in exerting its pharmacological actions, highlighting the importance of piperine as a bioenhancer in therapeutic formulations⁵⁶.

These mechanisms collectively modulate multiple physiological pathways, mitigating pain, inflammation, and tissue degeneration⁵⁷. Simultaneously, they support the preservation and restoration of joint architecture, improve functional capacity, and enhance musculoskeletal resilience⁵⁸. Through this integrated action, joint health is maintained, promoting mobility and reducing the progression of degenerative changes⁵⁹, thereby contributing to overall musculoskeletal well-being⁶⁰.

Discussion

Joint degeneration and chronic inflammation represent a complex interplay of structural, biochemical, and neuromuscular factors that collectively compromise mobility, functionality, and quality of life⁶¹. Osteoarthritis, rheumatoid arthritis, and age-associated musculoskeletal decline constitute the predominant contributors to global joint morbidity, affecting hundreds of millions worldwide⁶². Conventional pharmacotherapies, including non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids, and disease-modifying anti-rheumatic drugs (DMARDs), primarily provide symptomatic relief. However, their long-term use is associated with considerable adverse effects, such as gastrointestinal irritation, cardiovascular complications, renal toxicity, and systemic immunomodulatory disturbances⁶³. Consequently, there is growing scientific interest in safer, multi-targeted, natural interventions that can address both structural and functional aspects of joint disorders. In this context, nutraceutical formulations offer an integrative therapeutic approach by combining bioactive nutrients and herbal compounds capable of modulating multiple pathological pathways simultaneously⁶⁴.

Super Joints Tablets (SJT), developed by ManahVeda™, exemplify such an integrative strategy⁶⁵. The formulation incorporates a multi-herbal and multi-nutrient approach, combining glucosamine

hydrochloride, *Withania somnifera* (Ashwagandha), *Trigonella foenum-graecum* (Fenugreek) seed extract, *Boswellia serrata*, *Rosa canina* (Rosehip), *Curcuma longa* (Curcumin), *Alpinia galanga* (Rasna), and *Piper nigrum* (Piperine). Each constituent has been carefully selected based on mechanistic evidence and traditional usage, with the aim of providing synergistic therapeutic benefits⁶⁶. This discussion examines the pharmacological rationale, mechanistic pathways, and potential clinical implications of this formulation in the management of degenerative and inflammatory joint conditions.

Articular cartilage integrity is central to joint function, serving as a low-friction, shock-absorbing interface⁶⁷. Cartilage is composed predominantly of type II collagen, proteoglycans, chondrocytes, and extracellular matrix (ECM) components. In degenerative disorders such as osteoarthritis, an imbalance between matrix synthesis and degradation leads to cartilage thinning, subchondral bone remodeling, synovial inflammation, and osteophyte formation⁶⁸. Glucosamine hydrochloride, a key component of SJT, is a naturally occurring amino sugar essential for the biosynthesis of glycosaminoglycans and proteoglycans. Supplementation with glucosamine has been shown to enhance cartilage matrix formation, inhibit catabolic enzymes such as matrix metalloproteinases (MMPs), and maintain joint architecture⁶⁹. This dual action, supporting both structural repair and inhibition of degradation, provides a foundational benefit in slowing the progression of degenerative joint disease⁷⁰.

The structural preservation provided by glucosamine is complemented by the other bioactive constituents of SJT. For instance, the antioxidant-rich *Rosa canina* extract mitigates oxidative stress within cartilage and synovial tissues, protecting collagen and proteoglycans from reactive oxygen species-induced degradation⁷¹. Such antioxidant protection is critical, as oxidative stress accelerates ECM breakdown, chondrocyte apoptosis, and inflammatory cascades in the joint microenvironment⁷². Therefore, by integrating glucosamine with antioxidant botanicals, SJT addresses both structural deficiency and oxidative damage simultaneously⁷³.

Inflammation is a central driver of joint degeneration, mediated through a cascade of pro-inflammatory cytokines including TNF- α , IL-1 β , and IL-6⁷⁴. These cytokines activate destructive enzymatic pathways, including COX-2 and lipoxygenase-mediated production of prostaglandins and leukotrienes, perpetuating tissue damage and pain⁷⁵. *Boswellia serrata*, standardized to boswellic acids, inhibits 5-lipoxygenase (5-LOX), thereby reducing leukotriene synthesis and attenuating chronic inflammatory processes⁷⁶. Curcumin, a primary bioactive constituent of *Curcuma longa*, suppresses NF- κ B signaling, which regulates the transcription of pro-inflammatory genes⁷⁷. The inclusion of *Piper nigrum*, which enhances curcumin bioavailability, ensures effective systemic concentrations capable of exerting these pharmacological effects⁷⁸. Together, these agents create a multi-pronged anti-inflammatory network

within the joint, reducing cytokine-mediated tissue damage, edema, and nociceptive signaling⁷⁹.

Fenugreek (*Trigonella foenum-graecum*) adds further anti-inflammatory support through its saponin content⁸⁰. These bioactive molecules inhibit inflammatory mediators and oxidative damage, contributing to the alleviation of joint stiffness and pain⁸¹. Rosehip polyphenols additionally complement this effect, providing clinically validated pain reduction in osteoarthritis patients⁸². The collective impact of these anti-inflammatory compounds is synergistic: while glucosamine maintains cartilage integrity, the botanical extracts modulate the inflammatory milieu that otherwise drives tissue degeneration⁸³.

Oxidative stress, characterized by an imbalance between reactive oxygen species (ROS) production and antioxidant defenses, plays a significant role in joint degeneration⁸⁴. ROS directly damage chondrocytes, ECM proteins, and synovial membranes, exacerbating inflammation and structural deterioration. Rosehip extract, rich in vitamin C and polyphenols, has demonstrated chondroprotective and antioxidant effects⁸⁵. Fenugreek further contributes to this antioxidant defense, which is especially important in patients with comorbid conditions like obesity and diabetes, where systemic oxidative stress is elevated⁸⁶. By targeting ROS, SJT not only preserves cartilage but also indirectly reduces inflammatory signaling, creating a favorable environment for musculoskeletal recovery⁸⁷.

Chronic joint pain is not merely structural; neuromuscular and psychosomatic factors significantly influence disease manifestation and patient experience⁸⁸. Persistent stress elevates cortisol levels, which exacerbate inflammation, increase muscle tension, and diminish pain tolerance. Ashwagandha, a well-characterized adaptogen, modulates the hypothalamic-pituitary-adrenal (HPA) axis to reduce stress-induced cortisol elevation⁸⁹. Beyond its systemic effects, Ashwagandha improves neuromuscular strength, enhances endurance, and reduces perceived pain intensity⁹⁰.

Limitations and Future Directions

While SJT demonstrates significant mechanistic potential, there are limitations inherent to nutraceutical research. Variability in herbal extract standardization, patient adherence, diet, lifestyle factors, and baseline health status may influence outcomes. Furthermore, while synergistic effects are anticipated based on preclinical data, clinical validation is essential to confirm efficacy and safety in real-world populations. Future research should focus on randomized controlled trials with robust endpoints, including pain scores, functional mobility assessments, biomarkers of inflammation, cartilage integrity imaging, and quality-of-life measures. Investigating pharmacokinetic interactions and metabolic profiles will also strengthen translational applicability. Emerging research may explore the integration of SJT with conventional therapies, evaluating its potential to reduce required doses of NSAIDs or corticosteroids, thereby minimizing adverse

events. Additionally, stratification of patient populations based on metabolic status, age, and disease severity could optimize therapeutic outcomes, highlighting the personalized potential of multi-herbal nutraceutical formulations.

Conclusion

The therapeutic potential of Super Joints Tablets (SJT) lies in its multi-targeted, integrative design. By combining structural, anti-inflammatory, antioxidant, adaptogenic, and bioavailability-enhancing components, the formulation addresses the multifactorial pathology of joint degeneration and chronic inflammation. Glucosamine maintains cartilage architecture, Boswellia, Curcumin, Rosehip, and Fenugreek attenuate inflammation and oxidative stress, Ashwagandha modulates stress-mediated pathways, Rasna improves joint mobility, and Piperine enhances systemic bioavailability. Collectively, these mechanisms offer a holistic approach to joint health, supporting pain reduction, improved flexibility, structural preservation, and enhanced musculoskeletal resilience. While preclinical and clinical evidence supports the rationale of each constituent, further rigorous studies are necessary to confirm long-term efficacy, optimal dosing, and comparative performance against standard pharmacological therapies. Nevertheless, SJT represents a promising nutraceutical intervention, bridging the gap between traditional herbal wisdom and contemporary scientific understanding, with the potential to improve quality of life in individuals suffering from joint degeneration, inflammatory conditions, and age-related musculoskeletal decline.

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