

Unveiling the Synergy: Sciatica, Arthritis, and Their Integrated Approach to Wellness

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Abstract

This comprehensive review delves into the intricate connection between sciatica and arthritis, unraveling the etymological roots of “sciatica” from its ancient Greek and Latin origins. Tracing the historical aspects of sciatica back to the teachings of Hippocrates, the fifth-century BC Hellenic physician, sets the stage for a contemporary exploration of the interplay between these conditions. The sciatic nerve, including nerve roots spanning from L4 to S3, stands out as the largest nerve in the human body, boasting a diameter of up to 2 cm. This extensive nerve network is essential for motor function, offering direct support to a range of muscle groups in the lower extremities. Rheumatoid arthritis (RA), a chronic autoimmune disorder primarily affecting peripheral joints, typically spares spinal involvement but occasionally manifests with low back pain and sciatic radicular pain. Understanding the distinctive features of RA in the lumbosacral column enhances our grasp of its varied clinical presentations. In modern times, the review focuses on how sciatica and rheumatoid arthritis are related. RA primarily affects joints, but when it occasionally shows up in the lower back, it adds complexity to the clinical picture. The review explores the different ways RA-related sciatic nerve pain can present, highlighting the varied symptoms and potential challenges in diagnosing the condition. By looking at the historical roots and current aspects of sciatica and its link to rheumatoid arthritis, this review helps us better understand how these conditions interact. By combining ancient wisdom with modern medical insights, it offers a more complete perspective, aiming to improve the accuracy of diagnosis and enhance patient care in the complex world of sciatica and arthritis.

Keywords: Sciatica, arthritis, autoimmune disorder, lower back pain

INTRODUCTION

Sciatica and arthritis, two prevalent musculoskeletal conditions, cast a profound impact on individuals' well-being, presenting challenges that extend beyond localized pain. Sciatica, characterized by inflammation of the sciatic nerve, manifests as pain radiating down the buttock or thigh due to external pressure or irritation on the nerve. If left unaddressed, sciatica can progress, leading to long-term complications [1].

Arthritis, a broad term encompassing joint-related discomfort, further complicates the scenario. The

complexity arises not only from the distinct etiologies of these conditions but also from their potential interplay. Understanding the historical context of these ailments, as rooted in ancient medical teachings, adds depth to our comprehension [2].

Effective management of sciatica and arthritis requires a multi-faceted approach, ranging from conventional treatments such as hot and cold packs, medications, to more invasive interventions like surgeries. In this landscape, Johari Digital emerges as a pioneer, offering innovative and comprehensive

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therapies that address both sciatica and arthritis concurrently, aiming not just for symptomatic relief but also to mitigate the risk of permanent nerve damage [3].

The focus of this article extends beyond conventional treatments to explore a cutting-edge avenue – electrotherapy for sciatica. It can improve mobility and encourage quicker recovery, which makes it a useful supplement to traditional therapy. The intervention lessens muscular spasms and causes the body's natural analgesics, endorphins, to be released by interfering with or blocking the nerve signals that cause sciatic pain.

Additionally, the integration of sound wave therapy, specifically ultrasound, proves instrumental in accelerating healing and alleviating stiffness in affected muscles. By enhancing circulation and providing deep heat to the muscles, ultrasound therapy contributes to a holistic treatment approach.

Yet, the crux of innovation lies in the concept of combination therapy – a comprehensive solution addressing the intricate web of sciatica and arthritis (Figure 1). This approach revolves around electrical stimulation, employing electrical pulses to deter pain signals from reaching the brain. The synergy of various therapeutic modalities encapsulated in combination therapy demonstrates efficacy not only for sciatica but also for lower back pain, osteoarthritis, post-operative musculoskeletal pain, diabetic neuropathy, and frozen shoulder syndrome.

As we navigate through the amalgamation of ancient wisdom, contemporary innovations, and scientific insights, this article aims to unveil the synergy between sciatica and arthritis, presenting an integrated approach to wellness. By deciphering the complexities of these conditions and exploring novel therapeutic strategies, we aspire to contribute to a holistic understanding and effective management of sciatica and arthritis, ultimately enhancing the well-being of those affected.

As we explore this blend of ancient wisdom, modern innovations, and scientific inquiry, our goal is to uncover the connection between sciatica and arthritis. Beyond mere symptom management, this article aims to shed light on an integrated approach to wellness, offering a fresh perspective on understanding and managing these conditions and enhancing the overall quality of life for those dealing with these challenges.

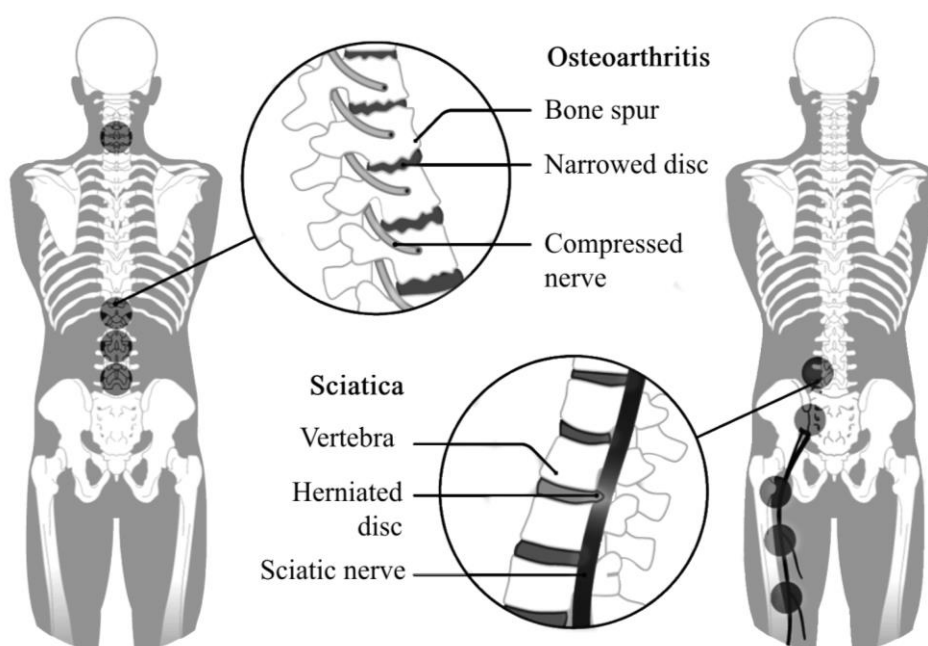


Figure 1. Difference between sciatica and arthritis.

DISCOVERY AND FURTHER HISTORY

The exploration of sciatica and arthritis is rooted in centuries of medical evolution, beginning with the ancient Greeks and extending through various historical milestones. The term “sciatica” finds its etymological origins in the Latin “sciaticus,” relating to the sciatic nerve. This nerve, the longest and widest in the body, originates in the lower back, traverses the buttocks and pelvis, and extends down the legs, playing a crucial role in leg and foot sensation and muscle control. The Hellenic physician Hippocrates of Kos, dating back to the fifth century BC, is among the earliest historical figures credited with mentioning the term “ischiacos,” likely referring to symptoms akin to what we now recognize as sciatica. The ancient Greek *ισχία* (ischia) and “ischiadikos” are at the root of the term, demonstrating the enduring concern and recognition of such conditions in ancient medical literature. Moving forward through time, the medieval period introduces additional nuances to the understanding of joint-related ailments. The term “arthritis,” a generic label for joint discomfort, becomes entangled with diverse conditions, leading to a certain degree of confusion. Medical practitioners of the time, including figures like John of Gaddesden, grappled with distinguishing between gout and arthritis, emphasizing symptoms such as pain in lower joints, feet, and toes [4].

While ancient and medieval perspectives often attributed joint issues to factors like humors, weather, or diet, the Renaissance witnessed a gradual shift toward more systematic observations. Avicenna, a Persian polymath, offered insights into the impact of climate on rheumatism, foreshadowing the recognition of external influences on musculoskeletal health. Fast-forwarding to contemporary times, the understanding of sciatica and arthritis has benefited from advances in medical knowledge, imaging technology, and treatment modalities. The integration of electrotherapy and ultrasound, as mentioned in the previous discussion, showcases the ongoing quest for innovative solutions to manage these conditions. Johari Digital's contributions to this field mark a modern chapter in the ongoing narrative, bringing forth a combination therapy approach that addresses not only sciatica but also related musculoskeletal challenges. This amalgamation of ancient terminology, historical insights, and cutting-edge therapeutic interventions contributes to the continuous evolution of our understanding and management of sciatica and arthritis. As research and clinical practices progress, we anticipate further refinements in our approach to enhancing the well-being of individuals grappling with these complex musculoskeletal issues [5].

SYMPTOMS

Arthritis (Generalized)

1. *Grating sensation*: Sensation of grating or grinding within the joint, known as crepitus, which may occur during movement.
2. *Swelling and stiffness*: Swelling of the joints can cause stiffness, which can hinder movement.
3. *Redness and warmth*: Inflammation triggers immune cells and inflammatory mediators to the site, resulting in the characteristic warmth and redness.
4. *Fatigue*: Generalized fatigue is common, especially during flare-ups.
5. *Decreased range of motion*: Joint damage can result in a decreased range of motion over time.

Sciatica

1. *Lower back pain*: Pain may radiate down one leg from the lower back.
2. *Leg pain*: Sharp, shooting pain along the sciatic nerve pathway (back of the thigh and calf).
3. *Numbness and tingling*: In the leg, numbness, tingling, or a “pins and needles” feeling.
4. *Weakness*: Weakness in the affected leg or foot may be present.
5. *Worsened by movement*: Pain often worsens with activities like sitting, standing, or walking.
6. *Radiating pain*: Lower back pain can travel down the leg and into the buttocks.

OVERLAPPING SYMPTOMS

Pain

Joint pain is a hallmark symptom of arthritis, often characterized by aching, throbbing, or sharp pain. Pain associated with the sciatic nerve is often characterized by a radiating discomfort that follows the

nerve's path, typically causing sensations of tingling, numbness, or electric shock-like sensations, which can profoundly affect mobility and daily activities [6].

Inflammation

Inflammatory arthritis types, such as rheumatoid arthritis, involve joint inflammation, causing swelling, redness, and warmth in the affected joints. Inflammatory arthritis prompts the release of cytokines and prostaglandins, leading to joint inflammation and systemic effects, while compression of the sciatic nerve induce inflammation, along with discomfort and potentially impacting adjacent tissues.

Stiffness

Joint stiffness meaning immobility and it results in difficulty in walking, especially upon awakening, make simple tasks like getting dressed, cooking etc., more difficult and time-consuming. Stiffness may be present, particularly when nerve compression affects the muscles around the lower back and buttocks.

Limited Range of Motion

Limited range of motion affects the daily activity of a person and affect the ability to bend or straighten the leg fully, hindering activities like walking, climbing stairs, or getting in and out of chairs. Pain and discomfort associated with sciatica can limit mobility, affecting the ability to perform certain movements comfortably [7].

Radiating Pain

Radiating pain can occur in conditions such as herniated discs, where pressure on spinal nerves causes discomfort to radiate along the affected nerve pathways. Sometimes numbness, tingling, or weakening in the afflicted areas coexist with radiating pain.

Numbness and Tingling

Numbness and tingling sensations are less common in arthritis but may occur if nerve compression or damage is present Numbness and tingling can also result from other underlying issues such as poor circulation, nerve entrapment syndromes (like carpal tunnel syndrome), vitamin deficiencies, or neurological conditions.

Muscle Weakness

Muscle weakness can arise from various factors, including disuse (due to lack of physical activity or immobilization), injury, neurological disorders, metabolic conditions, or underlying medical conditions such as arthritis.

Aggravation with Movement

This aggravation of symptoms may occur in various musculoskeletal conditions, including arthritis, where joint pain worsens with movement. Understanding which movements aggravate symptoms is essential for managing conditions effectively. Sciatic nerve pain may intensify with certain movements, such as bending, lifting, or prolonged periods of sitting or standing.

Morning Stiffness

Morning stiffness is a common characteristic of inflammatory arthritis, often lasting for more than 30 minutes. Morning stiffness is a common symptom experienced by individuals with various musculoskeletal conditions, including arthritis, such as rheumatoid arthritis and osteoarthritis, as well as conditions like fibromyalgia and ankylosing spondylitis [8].

DIAGNOSIS

Arthritis Diagnosis

1. *Clinical examination:* A rheumatologist may utilize the squeeze test and Finkelstein test during clinical examination to aid in diagnosing arthritis and related conditions. Evaluation of systemic symptoms such as fatigue and morning stiffness [9].

2. *Imaging studies*
 - i. *X-rays*: Used to detect joint damage, cartilage loss, and bone changes.
 - ii. *MRI (magnetic resonance imaging)*: MRI provides detailed images which helps to identify exact type and cause of arthritis by providing detail images.
 - iii. *CT (computed tomography) scan*: Occasionally used to visualize joints.
3. *Laboratory tests*
 - i. *Blood tests*: Blood tests aid in diagnosing arthritis by detecting inflammation markers, autoantibodies, and infectious agents associated with the disease. Rheumatoid Factor (RF) and Anti-cyclic Citrullinated Peptide (anti-CCP)
 - ii. *Antibodies*: Indicate specific types of arthritis, like rheumatoid arthritis.
 - iii. *Joint fluid analysis (arthrocentesis)*: Aspiration of synovial fluid for laboratory analysis, helping to identify inflammatory or infectious causes [10].

Sciatica Diagnosis

1. *Clinical evaluation*
 - i. Detailed patient history to understand symptoms, their onset, and aggravating factors.
 - ii. Physical examination, including neurological tests to assess reflexes, muscle strength, and sensation.
2. *Imaging studies*
 - i. *MRI (magnetic resonance imaging)*: Preferred imaging modality for visualizing the spine and identifying herniated discs, nerve compression, or spinal stenosis.
 - ii. *CT (computed tomography) scan*: CT (computed tomography) scans assist in identifying sciatica by providing detailed images of the spine, revealing herniated discs, bone spurs, or other abnormalities compressing the sciatic nerve, thereby aiding in diagnosis and treatment planning.
 - iii. *X-rays*: May be used to rule out other spinal conditions.
 - iv. *Electromyography (EMG) and nerve conduction studies*: By evaluating nerve function and muscle activity, respectively, these tests aid in the diagnosis of sciatica. They can pinpoint areas of nerve compression or damage along the sciatic nerve pathway, aiding in diagnosis and guiding treatment decisions.
3. *Physical examination techniques*
 - i. *Straight leg raise test*: Helps assess sciatic nerve irritation.
 - ii. *Neurological examination*: Checks for muscle weakness, reflex abnormalities, and sensory deficits [11, 12].

IMPACT OF ONE CONDITION ON THE OTHER

1. *Increased pain and discomfort*: Sciatica, characterized by inflammation and compression of the sciatic nerve, can exacerbate joint pain in individuals with arthritis. The radiating pain from the lower back and buttocks down the leg may intensify the overall discomfort associated with arthritis.
2. *Arthritis on sciatica*: Inflammatory arthritis, especially when affecting the spine or hip joints, can contribute to compression of the sciatic nerve, leading to increased sciatic nerve pain and discomfort.
3. *Compromised mobility*: Sciatic nerve compression can limit mobility, making it challenging for individuals with arthritis to engage in regular physical activities. Reduced movement may contribute to the progression of arthritis symptoms and joint stiffness. Joint damage and stiffness associated with arthritis can affect the overall range of motion, potentially exacerbating sciatic nerve compression and hindering normal movements [13, 14].
4. *Muscle weakness and atrophy*: Chronic sciatic nerve compression may lead to muscle weakness and atrophy in the lower back, buttocks, and legs, which can further compromise the stability of arthritic joints.
5. *Arthritis on Sciatica*: Arthritis-related joint damage and inflammation can contribute to muscle weakness, affecting the supporting structures around the spine and exacerbating sciatic nerve-related weakness.

6. *Impact on daily functioning*: Sciatica can impede daily activities, affecting an individual's ability to perform tasks that require bending, lifting, or prolonged periods of standing. This can exacerbate arthritis symptoms by placing additional stress on affected joints. Arthritis-related joint pain and stiffness can limit an individual's ability to move comfortably, potentially aggravating sciatic nerve compression during activities that involve the spine and lower extremities.
7. *Chronic inflammation*: Chronic inflammation associated with sciatica may contribute to systemic inflammation, potentially exacerbating arthritis symptoms throughout the body. Inflammatory arthritis types can directly impact the spine and adjacent structures, contributing to the compression and irritation of the sciatic nerve.
8. *Synergistic effect on mental health*: Persistent pain and limited mobility from sciatica can contribute to psychological distress, affecting the emotional well-being of individuals with arthritis. Chronic pain and physical limitations associated with arthritis may contribute to stress and anxiety, potentially intensifying the perception of sciatic nerve-related discomfort [15, 16].

TREATMENT

Internal Treatment for Arthritis

1. *Ferula galbaniflua (Galbanum)*
 - i. *Historical use*: Digestive, stimulant, antispasmodic, used for reducing flatulence and gripping pains.
 - ii. *Caution*: Galbanum contains powerful compounds; consult a healthcare professional before use.
2. *Helleborus niger (Black Hellebore)*
 - i. *Historical use*: Hydrogogue, cathartic, emmenagogue, stimulant.
 - ii. *Caution*: Contains potentially toxic compounds. Consult with a healthcare professional before use.
3. *Meum athamanticum (Spignel/Baldmoney)*:
 - i. *Historical use*: Diuretic, emmenagogue, carminative.
 - ii. *Caution*: Consult a healthcare professional before use.
4. *Raphanus sativus (Radish)*
 - i. *Historical use*: Considered bad for arthritis.
 - ii. *Caution*: While radishes are generally safe, excessive consumption may have side effects [17] [Table 1,2].

External Treatment for Arthritis

1. *Melissa officinalis (Balm)*:
 - i. *Historical use*: Leaves plastered on arthritic parts to relieve pain.
2. *Plantago psyllium (Fleawort)*:
 - i. *Historical use*: As a plaster for rheumatic areas, it has a cooling effect.
3. *Asphodelus sp. (Asphodel)*:
 - i. *Historical use*: Root, when drunk with wine, was believed to cure gout pains.
4. *Papaver somniferum (Opium Poppy)*:
 - i. *Use in the past*: A woman's milk combined with juice and saffron was used to treat gout.
Caution: Opium poppy contains potent compounds with potential side effects.
5. *Salix sp. (Willow)*:
 - i. *Historical use*: Decoction of various parts used as a rinse for gout [18, 19].

Table 1. Conventional marketed formulation [20, 21].

Types	Brand name	Company name	Dose	Prize
Tablet	IGUSIRE	Divyanshi Life Care	25 mg	₹ 288/ Stripe
Tablet	Colchiheal	Healing Pharma India Pvt. Ltd	0.5 mg	₹ 34/ Stripe
Tablet	Dexamethasone	AUSMED	4 mg	₹ 51.60/ Stripe
Tablet	Colchicine	Asumed	0.5 mg	₹ 36.50/ Strip
Injection	Durolane	Bioventus	3 ml	₹ 19000/ vial

Table 2. Novel marketed formulations [22–24].

Types	Brand name	Company name	Dose	Price
Capsule	Rinvoq	AbbVie.	0.6 mg	\$179.89 for 30 capsules
Capsule	Colchicine	West-Ward Pharmaceuticals Corp.	0.6 mg	per Unit: \$4.10116 per EA
Steroid injection	SP-102 (SEMDEXA)	Scilex Holding Company	10 mg	\$595 for a supply of 150 ml

HOLISTIC WELLNESS STRATEGIES

1. *Meditation and mindfulness:* By lowering stress, enhancing pain coping strategies, and encouraging relaxation, meditation and mindfulness practices can help treat sciatica. In order to improve their overall well-being and manage their pain more effectively, people with sciatica might potentially reduce their symptoms and improve their quality of life by encouraging a judgment-free awareness of their sensations.
2. *Nutrition and dietary choices:* Foods high in antioxidants, omega-3 fatty acids, and anti-inflammatory substances are the focus of the anti-inflammatory diet. Eat more fruits, vegetables, healthy grains, and fatty fish and less processed, sugary, and saturated-fat foods [25].
3. *Regular exercise:* Regular exercise can benefit individuals with sciatica by improving flexibility, strengthening muscles that support the spine, and promoting better posture. Specific exercises such as cobra pose, lumbar stretching exercise are really helpful.
4. *Physical therapy:* Targeted Exercises guided by physical therapist to develop a customized exercise program targeting specific muscle groups to support joints affected by arthritis and alleviate sciatic nerve compression.
5. *Stress management:* Relaxation techniques, practice stress-reducing techniques, including deep breathing exercises, progressive muscle relaxation, or biofeedback, to manage stress and alleviate tension.
6. *Quality sleep:* High-quality sleep can be achieved by using appropriate sleep hygiene habits, which include sticking to a regular sleep schedule, making your bedroom cozy, and using relaxation techniques before bed.
7. *Weight management:* Maintaining a healthy weight through a balanced diet and regular exercise can help reduce strain on the lower back and sciatic nerve, potentially alleviating pain and improving mobility. Additionally, losing weight can decrease inflammation in the body, which may contribute to sciatica symptoms.
8. *Complementary therapies:* Think about acupuncture; it can help balance the body's energy flow, which can reduce pain and enhance general health. Massage therapy and mind-body exercises like tai chi and yoga might help you relax.
9. *Social support:* Social support is integral for coping with sciatica, offering emotional encouragement, practical aid, and a sense of belonging. Whether it's from friends, family, support groups, or healthcare professionals, understanding, empathy, and encouragement can alleviate feelings of isolation and stress often linked with chronic pain. Engaging with supportive individuals and communities can foster resilience and improve overall well-being amid the challenges of managing sciatica.
10. *Cognitive behavioral therapy (CBT):* CBT can help individuals cope with chronic pain by addressing negative thought patterns, promoting adaptive behaviors, and enhancing emotional well-being.
11. *Hydrotherapy:* water-based exercises in a pool or warm water, which can provide relief from joint pain and improve overall mobility.
12. *Aromatherapy: essential oils:* Some individuals find relief from pain and stress through the use of essential oils, such as lavender or peppermint, which can be applied topically or diffused [26].

INTEGRATED TREATMENT APPROACHES [27, 28]

1. *Medical interventions:* Utilize anti-inflammatory medications to manage arthritis-related joint pain and sciatic nerve inflammation. Commonly given treatments include muscle relaxants, neuropathic painkillers like gabapentin, and nonsteroidal anti-inflammatory drugs (NSAIDs) (Table 1 and 2).

2. *Physical therapy*: Create specialized workout regimens to relieve sciatic nerve strain, increase joint flexibility, and strengthen muscles. Include specific stretches to improve range of motion in impacted areas and ease stiffness in joints.
3. *Lifestyle modifications*: Encourage weight management to alleviate stress on joints and minimize the impact on sciatica and arthritis symptoms. Advocate for regular, low-impact exercise, such as swimming or walking, to support overall joint health and alleviate sciatic nerve compression.
4. *Alternative therapies*: Alternative therapies, such as acupuncture and chiropractic care, offer non-invasive approaches to complement traditional treatments for sciatica. These modalities aim to alleviate pain, reduce muscle tension, and improve overall well-being through techniques like massage therapy and yoga. Herbal remedies and heat/cold therapy may also be used to provide relief from inflammation and discomfort associated with sciatica. To be confident that these alternative remedies are safe and successful in treating sciatica symptoms, it's crucial to speak with a healthcare professional [27].
5. *Patient education*: Patient education is essential in managing sciatica and arthritis, informing individuals about causes, symptoms, and treatment options while emphasizing adherence to treatment plans and lifestyle modifications. This education encompasses pain management techniques, including posture, exercise, and medication management, ensuring informed decision-making for improved healthcare outcomes. Offer guidance on ergonomic practices and proper body mechanics to minimize stress on joints and the sciatic nerve [28].
6. *Cognitive behavioral therapy (CBT)*: Integrate psychological support through CBT to help individuals cope with chronic pain, stress, and anxiety associated with both conditions.
7. *Assistive devices*: Recommend assistive devices such as joint braces or supports to provide stability and reduce pressure on arthritic joints. Consider ergonomic aids to enhance daily activities and minimize strain on the lower back and sciatic nerve.
8. *Nutritional guidance*: Include soybeans and chickpeas for their protein and anti-inflammatory properties, while fatty fish and ginger offer omega-3s and anti-inflammatory benefits to alleviate symptoms of sciatica and arthritis. Consider nutritional supplements, under medical guidance, to address specific deficiencies associated with arthritis and sciatica.
9. *Multidisciplinary collaboration*: Foster collaboration among healthcare professionals, including rheumatologists, orthopedic specialists, physical therapists, and pain management experts, to ensure cohesive and well-coordinated approach.
10. *Regular monitoring and adjustments*: Consistent monitoring and adjustments are crucial in arthritis and sciatica management, enabling healthcare providers to track progress, evaluate treatment effectiveness, and adapt interventions as needed, ensuring personalized care and improved symptom control for patients over time. Maintain open communication to address any emerging challenges or changes in symptoms promptly.

PATIENT CENTRIC CARE

Patient-centric care takes center stage in managing the intricate interplay between sciatica and arthritis, emphasizing the collaborative partnership between healthcare providers and individuals grappling with these conditions. This approach goes beyond traditional healthcare models by empowering patients with informed decision-making, understanding their preferences, values, and lifestyle choices, and tailoring treatment plans to address their unique circumstances. Recognizing the interconnectedness of physical and mental well-being, patient-centric care fosters a dynamic feedback loop, ensuring ongoing adjustments and a shared commitment to the individual's journey toward optimal well-being. In the realm of sciatica and arthritis, patient-centric care serves as a guiding principle, celebrating the diversity of experiences while forging a collaborative path to personalized and effective healthcare [29, 30].

CONCLUSION

The integrated approach to managing sciatica and arthritis unveils a synergy that combines historical wisdom with modern medical insights. By exploring ancient remedies and their resonance in

contemporary healthcare, we discern valuable strategies for optimizing patient well-being. The overlapping symptoms of these conditions necessitate a patient-centric care model, emphasizing shared decision-making and tailored treatment plans that align with individual preferences and lifestyle choices. The amalgamation of medical interventions, physical therapies, psychological support, and lifestyle adjustments forms a holistic roadmap for comprehensive wellness. As we bridge the gap between historical wisdom and contemporary healthcare, the integrated approach emerges as a dynamic paradigm, offering promising possibilities for enhancing the quality of life for individuals navigating the intricate interplay of sciatica and arthritis. It calls for a collective commitment to advancing personalized, compassionate, and effective healthcare that embraces the entirety of an individual's physical, mental, and emotional health [31,32].

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