

Effectiveness of Conservative Therapies for Temporomandibular Joint Disorders: A Systematic Review

Pooja K. Nidhi¹, Sindhura K Prasanth²

¹Gardencity University, Department of Physiotherapy, Kithaganur Main Road, Bengaluru, Karnataka 560049, India
Email: Nidhi.k.pooja[at]gmail.com

²Gardencity University, Department of Physiotherapy, Kithaganur Main Road, Bengaluru, Karnataka 560049, India
Email: Sindhura.k[at]gcu.edu.in

Abstract: Common musculoskeletal problems known as temporomandibular joint disorders (TMDs) result in pain, restricted jaw movement, and a lower standard of living. The objective of this systematic review was to evaluate the efficacy of non-surgical treatment approaches for TMDs, such as manual therapy, exercise therapy, physiotherapy, and muscle energy methods (MET). A thorough search for research published between 2000 and 2025 was done in PubMed, Scopus, Web of Science, and the Cochrane Library. Eight of the 243 studies that were found satisfied the requirements for inclusion. The findings indicated that non-surgical treatments significantly reduced pain, increased mandibular mobility, and improved functional outcomes. Combination therapies, such as exercise therapy with manual therapy or MET, produced better results than single interventions. Physiotherapy-based and personalized approaches achieved greater pain relief and improved jaw function. Epidemiological data have shown that TMDs are more common in females aged 20–40 years, with myogenic dysfunction and disc displacement being the most frequent forms. Despite differences in study design and treatment duration, evidence supports nonsurgical management as a safe, effective, and affordable first-line treatment for TMDs. The small sample sizes and brief follow-up times, however, emphasize the necessity of additional long-term, high-quality randomized controlled trials to validate these findings.

Keywords: Temporomandibular Dysfunction, nonsurgical treatments, physiotherapy, exercise therapy, manual therapy

1. Introduction

The temporomandibular joint (TMJ), masticatory muscles, and surrounding structures are all impacted by a collection of musculoskeletal and neuromuscular illnesses known as temporomandibular joint disorders (TMDs). Their quality of life is greatly diminished by their frequent symptoms, which include discomfort, restricted jaw movement, joint sounds, and functional limitations.^(1,3) The etiology of TMD is complex, involving anatomical, physiological, psychological, and genetic factors that may predispose, trigger, or prolong the disorder^(3,4). Psychological stress, trauma, occlusal abnormalities, dysfunctional behaviours, and postural issues are associated with TMD development and progression^(3,4).

TMD prevalence varies widely, ranging from 10% to 35% of the population, with higher rates in females and individuals aged 20 to 40^(2,4). Despite the availability of both surgical and non-surgical treatment options, conservative non-surgical approaches remain the primary choice because of their safety, cost-effectiveness, and positive effects on pain relief and functional improvement^(1,5). Common non-surgical therapies include physiotherapy, exercise therapy, manual therapy, and muscular energy techniques, each targeting different aspects of jaw function and pain management^(1,6,7). In order to guide therapeutic decision-making, this systematic review sought to fully evaluate the impact of various nonsurgical treatments on clinical outcomes in TMD patients, evaluate available data, and pinpoint areas in need of further investigation.

2. Literature Survey

Temporomandibular disorders (TMDs) are common musculoskeletal problems affecting the masticatory muscles and temporomandibular joint, often causing pain, limited jaw movement, and functional issues. Research shows that non-surgical treatments like physiotherapy, exercise therapy, manual therapy, and muscle energy techniques (MET) are key for conservative management. Numerous systematic reviews and randomized controlled trials (Dickerson et al., 2020; González-Sánchez et al., 2019; Paço et al., 2019; Agarwal et al., 2020) have reported significant reductions in pain and improvements in mouth opening after these treatments. MET is especially effective for muscular TMDs, and combining manual therapy with exercise provides greater benefits than using either approach alone.

The majority of the included studies showed short-term advantages, but because of small sample sizes, inconsistent methods, and short follow-up periods, the long-term effects are yet unknown. Direct comparisons were hampered by the variability of study designs and the generally moderate quality of the data. Conservative physiotherapy-based care is seen to be safe, non-invasive, and clinically advantageous for pain relief and functional restoration in individuals with FAI, despite these drawbacks. To bolster the data and determine the best therapy combinations for TMD management, future research should concentrate on large-scale randomized trials, standardized treatment regimens, and long-term follow-ups.

Problem Definition

The term "temporomandibular disorders" (TMDs) refers to a group of musculoskeletal and neuromuscular conditions that impact the chewing muscles, the temporomandibular joint (TMJ), and associated structures. These conditions are a major contributor to functional impairment and orofacial pain, especially in young and middle-aged people. TMD sufferers frequently have pain, difficulty opening their lips, clicking sounds, and difficulties speaking or chewing, all of which considerably lower their quality of life.

Although various non-surgical management approaches, such as physiotherapy, manual therapy, exercise therapy, and muscle energy techniques (MET), are frequently used, there is still no standardized treatment protocol or strong consensus regarding their comparative effectiveness. Existing studies show varying results, short follow-up periods, and inconsistent outcome measures, making it difficult to draw definitive clinical conclusions.

Therefore, there is a need to systematically review and analyze the existing scientific evidence to determine the

effectiveness of conservative physiotherapy-based treatments in relieving pain, improving mouth opening, and restoring function in patients with TMD. This review aims to identify the most effective nonsurgical interventions and highlight gaps in future research to improve the evidence-based management of TMDs.

3. Methodology

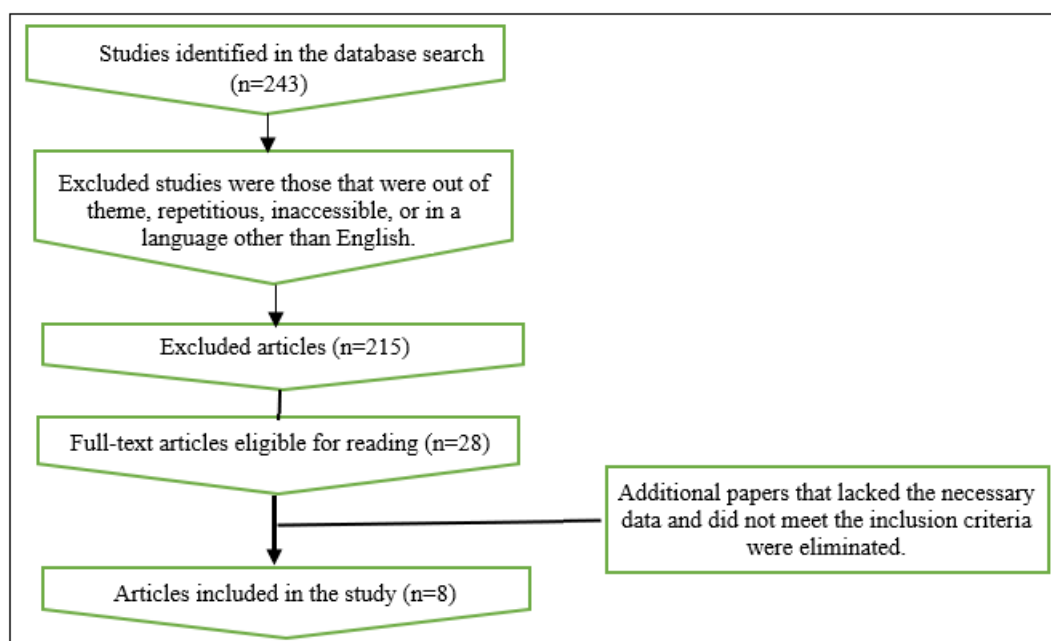
Study design

This systematic review was conducted based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines.

Selection of studies

A search utilizing the keywords yielded a total of 50 articles, which were then filtered and arranged based on the inclusion and exclusion criteria. Eight articles that satisfied the inclusion criteria were added to the research

Study Selection Strategy



Inclusion criteria and Exclusion criteria

This review comprised systematic reviews, meta-analyses, and randomized controlled trials on the non-surgical treatment of temporomandibular joint disorders (TMDs) in persons aged 18 and above. Eligible studies included therapies such as physiotherapy, exercise therapy, manual therapy, and muscle energy techniques, with reported outcomes including pain relief, improved jaw function, and improved quality of life. Only English-language

publications from 2000–2025 were evaluated. Studies that focused on surgical or invasive treatments, included pediatric, animal, or in vitro populations, or were case reports, editorials, or narrative reviews were all eliminated. Research with insufficient or unclear outcome data, as well as those published in languages other than English, were eliminated. These criteria ensured that only valid and relevant evidence about conservative TMD therapy was included in the study.

Summaries of studies included

Author	Study Design	Participants	Objective of the study	Results obtained	Conclusion
Nandhini et al. (2018)	randomized controlled trials (RCTs)	Patients with temporomandibular joint (TMJ) disorders.	to evaluate how well different nonsurgical treatments work for treating TMJ issues.	Significant reduction in pain ($p = 0.00$), increased maximal pain-free mouth opening ($p = 0.0138$), decreased dysfunction level ($p = 0.0007$), but no statistically significant	For the initial management of TMJ disorders, straightforward, reasonably priced nonsurgical treatments provide beneficial therapeutic results.

				improvement in pain pressure threshold ($p = 0.6600$).	The authors recommend using both objective and subjective outcomes for better reliability in future research.
Manfredini et al. (2016)	Systematic review	34	To systematically review the association between facial (skeletal) morphology and TMJ disorders	The majority of research indicates that a higher incidence of TMJ disc displacement and degenerative diseases is linked to vertical facial dimensions (skeletal Class II, hyperdivergent patterns). However, different methodologies and study qualities limited firm conclusions. Some features like sagittal and vertical discrepancies, mandibular ramus deficiency, and long-face patterns relate to TMJ pathology.	Although there isn't enough solid data in the literature, it seems that hyperdivergent facial growth patterns and skeletal Class II profiles are associated with a higher risk of TMJ disc displacement and degenerative alterations. Further higher-quality studies are needed for definitive answers
Valesan et al., 2021	Systematic review	General populations	To assess the general population's prevalence of temporomandibular joint disorders (TMJD)	Overall TMJD prevalence in adults/elderly: 31.1%; in children/adolescents: 11.3%. The most prevalent TMJD was disc displacement with reduction (DDwR), affecting 25.9% of adults/elderly and 7.4% of children/adolescents. Other forms such as arthralgia, degenerative joint disease and osteoarthritis had lower prevalence.	TMJD is common globally, affecting about one-third of adults. Disc displacement with reduction is the most frequent disorder. Awareness of TMJD prevalence supports early diagnosis and appropriate management strategies in dental practice
González-Sánchez et al., 2023	Systematic review	General participants	To analyze different physiotherapy techniques effectiveness used in TMD management and identify dysfunctions treated with physiotherapy as primary treatment	Different physiotherapy techniques, used alone or combined, effectively controlled primary symptoms of TMD: pain reduction, functional improvement, and quality of life enhancement. Manual therapy and therapeutic exercise protocols were most commonly used and showed best results for TMD symptom management.	Physiotherapy is supported by sufficient scientific evidence as a conservative treatment for TMD. Combined physiotherapy techniques provide superior outcomes. Manual therapy and therapeutic exercise are cornerstone modalities. Future studies should focus on standardizing protocols and identifying mechanisms of action.
Paço et al., 2016	Randomized control trails (RCTs)	General participants	To analyze methodologic quality and summarize the evidence on physiotherapy's effects in managing temporomandibular disorders	A meta-analysis revealed that physiotherapy significantly reduced pain (Standardized Mean Difference (SMD) = -0.63; 95% CI: -0.95 to -0.31; 8 trials), but there was no statistically significant improvement in active range of motion (ROM) (SMD = 0.33; 95% CI: -0.07 to 0.72). Heterogeneity was low for pain, moderate for ROM.	In TMJ issues, physiotherapy seems to be useful in reducing pain and may enhance active range of motion. Nevertheless, additional high-quality RCTs and meta-analyses are necessary to validate these findings and enhance generalizability because the available data is not conclusive.
Dickerson et al., 2017	Systematic review	419	To find out how well exercise treatment works for people with temporomandibular joint dysfunction in terms of pain, function, and mobility	Exercise therapy, particularly mobility and mixed approaches, provided moderate short-term benefits and variable long-term effects. Significant reductions in pain and improvements in range of motion (ROM) were observed. Functional improvement was less significant.	Exercise therapy can reduce pain and improve mandibular range of motion in TMD patients. Mobility and mixed exercise approaches were identified as effective. However, evidence for functional improvements is limited. Further research for definitive conclusions.
Agarwal, 2025	Randomized controlled trials (RCTs)	Total 553 patients, 133 males and 420 females	To assess how well Muscle Energy Technique (MET) works to treat TMJ dysfunction,	To assess how well Muscle Energy Technique (MET) works to treat TMJ dysfunction, with an emphasis on lateral deviation,	Results back up the therapeutic application of MET to treat muscular-based TMJ dysfunction. MET works

			with an emphasis on lateral deviation, pain severity, and maximal mouth opening	pain severity, and maximal mouth opening	well to reduce pain and increase maximal mouth opening. The review recommends incorporating MET as part of comprehensive physiotherapy management. Further high-quality trials are needed.
Asquini et al. (2022)	Systematic review	General population	To assess the efficacy of manual therapy interventions targeted especially at craniomandibular tissues in terms of improving function and reducing discomfort	Significant increases in pain intensity and maximum mouth opening were recorded in all included studies from	Patients with TMD benefit from manual treatment that targets the craniomandibular regions to improve function and reduce pain.

4. Results

In total, 243 articles were found using different databases. Of these, 215 were removed because of duplication, lack of data, inaccessibility, and irrelevance to the subject. A total of twenty-eight full-text articles were evaluated for eligibility, with eight studies fulfilling the inclusion criteria for this systematic review.

The results from the studies included clearly suggest that non-surgical treatment significantly contributes to enhancing the condition of individuals with temporomandibular joint disorders (TMDs). Methods like physiotherapy, exercise therapy, manual therapy, and muscle energy techniques consistently demonstrated effectiveness in decreasing pain, enhancing maximal mouth opening, and improving jaw mobility and function ^(1,3,7). Numerous studies indicated notable enhancements in pain relief and mandibular mobility after implementing organized, individualized treatment plans ^(4,5,6). Combination therapies that combined exercise and manual therapy produced better results than individual treatments ^(8,10).

Muscle energy techniques have been shown to be especially beneficial in addressing myogenic temporomandibular dysfunction by enhancing pain relief, mouth opening, and muscle relaxation ⁽⁹⁾. Manual therapy utilized on craniomandibular structures demonstrated favourable outcomes in enhancing joint mobility and alleviating discomfort ⁽¹¹⁾. Physiotherapy techniques that combine exercise with manual elements enhanced overall functionality and quality of life ^(6,8). Research on morphology and prevalence indicated that temporomandibular disorders were more prevalent in females between 20 and 40 years old, with disc displacement and myogenic dysfunction being the most common subtypes ^(3,5).

5. Discussion

The combined results of the eight studies indicate that patients with temporomandibular joint disorders (TMDs) benefit from non-surgical therapies, such as physiotherapy, manual therapy, exercise therapy, and muscle energy techniques (MET), in terms of pain reduction, improved mandibular mobility, and enhanced quality of life. Before contemplating surgical options, all studies recommended

conservative therapy as the first-line strategy. Each study offered distinct viewpoints and highlighted particular methodological flaws that reduced the strength of the overall evidence, even though the direction of the results was consistent.

Nandhini et al. (2018) showed that nonsurgical treatments, particularly manual therapy and physiotherapy, significantly reduced pain and enhanced mouth opening in patients with TMD. The researchers stressed that early stage management can benefit from simple and cost-effective treatment. Nevertheless, their study did not measure sustained benefits after the initial treatment period and lacked a long-term follow-up. Future studies should include longer follow-ups to determine the long-term effects, despite the encouraging short-term results.

Paço et al. (2016) discovered that while physiotherapy significantly relieved pain, there was not much evidence that it improved the mandibular range of motion. Reliability was challenging because of the considerable heterogeneity and small sample size of the study. Although more standardized intervention methods and larger randomized controlled trials are required, the results suggest that physiotherapy is a significant treatment. From our perspective, the strength of this study is the collection of data that shows pain reduction; however, it also highlights the differences in the functional outcomes measured by other researchers.

After reviewing several physiotherapy approaches, González-Sánchez et al. (2023) discovered that the best symptom reduction was achieved by combination treatments, such as manual and exercise therapy. This study emphasizes the value of combining several approaches compared to relying on just one of them. The lack of standardized assessment instruments and variation in treatment length are its primary drawbacks. In our view, this promotes a multimodal, patient-centered approach, where treatment programs are tailored to each patient's needs.

Dickerson et al. (2017) examined exercise treatment and found that it had a moderate short-term positive impact on mandibular range of motion and pain reduction. However, the study found fewer consistent effects for long-term functional benefits. Key limitations include the lack of consistent exercise regimens and brief intervention periods. In my opinion, exercise therapy is a useful supportive

component of conservative care; however, for long-term outcomes, it must be continuously maintained and combined with other modalities.

Agarwal (2025) investigated the impact of Muscle Energy Technique (MET) and found that among patients with TMD with muscular involvement, MET significantly improved maximal mouth opening and reduced pain. The study had limitations due to its small sample size and lack of comparison control groups, despite its therapeutic importance. Since MET targets muscle tension, it appears to be a useful alternative to physiotherapy; however, future research should compare it with other manual techniques to obtain more dependable results.

Asquini et al. (2022) examined the effects of manual therapy on the craniomandibular structures and found it significantly improved jaw function and reduced pain, especially during mid-term follow-ups. However, the overall evidence was limited due to variations in study design, and only a few investigations showed results that were significantly better than those of the control groups. In our view, manual therapy remains a crucial part of conservative care for TMDs, but it seems to work even better when combined with exercises or muscular energy approaches, leading to a more comprehensive and effective treatment plan.

Manfredini et al. (2016) took a different approach by examining the link between TMD incidence and facial shape. Their study showed that individuals with long face patterns and skeletal Class II features were more likely to experience disc displacement and degenerative changes in the temporomandibular joint. However, because the included studies used different research methods and diagnostic standards, the reliability of these findings is limited. In our view, these observations highlight the importance of personalized treatment plans that consider each patient's unique facial structure and biomechanics, making this approach both clinically valuable and practical.

Overall, all eight studies agreed that conservative treatment is safe, cost-effective, and beneficial for patients with TMDs. However, common limitations include small sample sizes, a lack of standardized outcome measures, and short follow-up durations. Our overall thought is that nonsurgical management should remain the first-line therapy for TMDs, and future research must focus on developing consistent protocols, ensuring longer-term studies, and integrating multimodal treatment approaches for better and lasting patient outcomes.

6. Conclusion

The results of this systematic review clearly show that nonsurgical treatment is an effective primary strategy for addressing temporomandibular joint disorders (TMDs). Approaches such as physiotherapy, exercise therapy, manual therapy, and muscle energy techniques have reliably demonstrated their effectiveness in decreasing pain, improving jaw function, and boosting overall quality of life. The findings from the eight studies examined indicate that

these conservative treatments are safe, cost-effective, and clinically beneficial compared to surgical options.

Moreover, the analysis emphasizes that integrating various non-surgical approaches, such as exercise therapy along with manual therapy, yields better results than treatments using a single method. Personal factors, such as facial structure, sex, and degree of impairment, greatly affect treatment results, highlighting the necessity for tailored and patient-focused care. This method guarantees that management strategies are customized to the specific needs and traits of each person for optimal outcomes.

Although the results are encouraging, the review points out various limitations, such as brief follow-up periods, moderate variability in methods, and insufficient standardization of the treatment protocols. Consequently, future studies should concentrate on performing long-term, high-quality randomized controlled trials to create uniform guidelines for the nonsurgical treatment of TMDs. This review ultimately found that conservative treatments are both efficient and feasible, providing patients with significant pain alleviation and functional improvement while reducing risks and healthcare expenses.

7. Future Scope

According to the article reviewed, future research should aim to enhance the quality and uniformity of studies concerning the non-surgical treatment of temporomandibular disorders (TMDs). Many of the studies included had limitations such as small participant numbers, brief follow-up durations, and inconsistent treatment methods, which weaken the conclusions drawn. To establish definitive evidence on the long-term benefits of physiotherapy, manual therapy, exercise therapy, and muscle energy techniques (MET), upcoming research should involve large-scale randomized controlled trials with standardized intervention protocols.

Further studies are needed to compare single-modality and multimodal approaches to determine the most effective treatment combinations for pain relief and functional recovery. Incorporating objective outcome measures, such as imaging or biomechanical analysis, can enhance the accuracy of the results. Moreover, identifying the specific type of TMD (myogenic, arthrogenic, or mixed) in participants will allow for more targeted and personalized treatment strategies to be developed. Collaborative multidisciplinary research involving physiotherapists, dentists, and researchers is essential for developing standardized evidence-based clinical guidelines for the nonsurgical management of TMDs.

References

- [1] Nandhini J, Ramasamy S, Ramya K, Kaul RN, Felix AJW, Austin RD. Is non-surgical management effective in temporomandibular joint disorders – A systematic review. *J Clin Diagn Res.* 2018;12(4):CE01–CE06.
- [2] Manfredini D, Segu M, Rossi A, Guarda-Nardini L. Temporomandibular joint disorders in patients with

different facial morphology – A systematic review. *Cranio*. 2016;34(1):1–9.

- [3] Valesan LF, Doebber Da-Cas C, Reus JC, Denardin ACS. Prevalence of temporomandibular joint disorders – A systematic review. *J Oral Rehabil*. 2021;48(5):465–476.
- [4] Kapos FP, Exposto FG, Velly AM, Schiffman EL, Look JO, Hodges JS, et al. Temporomandibular disorders: Current concepts in diagnosis and management. *J Oral Facial Pain Headache*. 2020;34(1):8–16.
- [5] Alqutaibi AY, Al-Harthy M, Alzahrani A, et al. Global prevalence of temporomandibular disorders: A systematic review and meta-analysis. *J Public Health*. 2025. (In press).
- [6] González-Sánchez B, García-Montero P, Ramírez-Durán MDV, Garrido-Ardila EM, Rodríguez-Mansilla J, Jiménez-Palomares M. Physiotherapy in management of temporomandibular joint disorders: Systematic review. *Clin Rehabil*. 2023;37(2):145–156.
- [7] Paço M, Peleteiro B, Duarte J, Pinho T. The effectiveness of physiotherapy in the management of temporomandibular disorders – A systematic review and meta-analysis. *J Oral Rehabil*. 2016;43(12):940–952.
- [8] Dickerson SM, Weaver JM, Boyson AN, Thacker JA, Junak AA, Ritzline PD, Donaldson MB. The effectiveness of exercise therapy for temporomandibular dysfunction: A systematic review. *Phys Ther Rev*. 2017;22(3–4):180–189.
- [9] Agarwal A, Sundus H, Zaidi S, Chhabra C, Khan SH. Effectiveness of muscle energy techniques in patients with temporomandibular joint dysfunction: A systematic review. *Man Ther Today*. 2025;1(2):35–42.
- [10] Asquini G, Pitance L, Michelotti A, Falla D. Effectiveness of manual therapy applied to craniomandibular structures in temporomandibular disorders – A systematic review. *J Oral Rehabil*. 2022;49(9):943–954.
- [11] American Academy of Family Physicians. Temporomandibular disorders: Rapid evidence review. *Am Fam Physician* [Internet]. 2023 [cited 2025 Nov 2];107(1). Available from: <https://www.aafp.org/pubs/afp/issues/2023/0100/temporomandibular-disorders.html>
- [12] Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) Consortium. Diagnostic criteria for temporomandibular disorders (DC/TMD) – Comprehensive clinical assessment protocol. *J Oral Facial Pain Headache*. 2014;28(1):6–27.
- [13] Armijo-Olivo S, Magee DJ, Fuentes JP, Major PW. Diagnosis and management of temporomandibular disorders: An evidence-based review. National Center for Biotechnology Information (NCBI). 2018.
- [14] Paço M, Peleteiro B, Duarte J, Pinho T. The effectiveness of physiotherapy in the management of temporomandibular disorders – A systematic review and meta-analysis. *J Oral Rehabil*. 2016;43(12):940–952.
- [15] Asquini G, Pitance L, Michelotti A, Falla D. Effectiveness of manual therapy applied to craniomandibular structures in temporomandibular

disorders – A systematic review. *J Oral Rehabil*. 2022;49(9):943–954.

Author Profile



Pooja K. Nidhi, Student, Department of Physiotherapy, Garden City University, Bengaluru, Karnataka, India. She completed her Bachelor of Physiotherapy (BPT) from Garden City University and is currently pursuing a Master of Physiotherapy (MPT) at the same institution. Her academic interests include musculoskeletal physiotherapy, neuro-rehabilitation, exercise therapy, and evidence-based physiotherapy practice



Dr. Sindhura K. Prasanth, Musculoskeletal & Sports Physiotherapist. She is physiotherapist specializing in Musculoskeletal and Sports Physiotherapy, with academic training from Pondicherry University (UG) and Kerala University (PG). Born in Kerala, She has gained professional experience working under the Rajiv Gandhi University of Health Sciences, Karnataka, and I am currently part of the faculty at Garden City University, Bangalore. My work focuses on evidence-based rehabilitation, sports injury management, and enhancing functional performance.