
REVIEW ARTICLE

The Role of Sustained Natural Apophyseal Glides and Multimodal Therapies in Alleviating Pain and Disability in Mechanical Low Back Pain- A Review

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ABSTRACT

Among all the musculoskeletal conditions, mechanical low back pain (MLBP) is the most prevalent condition substantially affecting activities of daily living, work efficacy and quality of life. This review intended to explore the impact of Sustained Natural Apophyseal Glides (SNAGs) on pain reduction and improvement in disability in individuals affected with MLBP and also comparing its efficacy with other therapeutic approaches. A comprehensive review of the existing literature was conducted by analysing all the available randomized controlled trials (RCTs) evaluating the effect of SNAGs with other manual therapy techniques in different types of population. SNAGs have exhibited a strong futuristic implication in treatment approach for MLBP as a safe and efficient manual therapy intervention offering both instant relief in pain levels and long drawn functional improvement.

KEYWORDS: Mulligan mobilization, Sustained natural apophyseal glides, Mechanical low back pain, disability, functional range of motion

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INTRODUCTION

In modern times, the leading cause of musculoskeletal disability in individuals tends to be low back pain (LBP). The burden of disability due to LBP has increased over by 60% most likely due growth of population and ageing factor over past four decades [1]. Pathological etiology contributes only a small percentile of LBP marking it more to be cause of unelucidated mechanisms. Lumbar pain or lumbago pain is typically due to nonspecific or mechanical reasons. MLBP refers to pain which originates from the spinal structures involving facet joints, intervertebral disc and other surrounding tissues involving muscles cause significant pain and discomfort [2]. Besides mechanical factors like lifting injuries, improper posture or postural variance, or degenerative changes contribute to MLBP. Other factors which significantly contributes to LBP are smoking, poor health status comorbidities (such as asthma, headaches, diabetes, osteoarthritis and osteoporosis), lower levels of physical activities and mental health altogether contribute in LBP [3].

Conventional and traditional management strategies of LBP involve pharmacological drugs, electrotherapy modalities and various manual therapy techniques. Manual therapy being a core part of physiotherapy tends to work on pain reduction and improved spinal movements through use of hands on and manipulations. It mainly comprises of techniques like Maitland and Kaltenborn mobilization. These techniques targeted on restoring joint movement and function by targeting both the way joints glide (arthrokinematics) and how bones move in relation to each other (osteokinematics) [4]. The main key

approach of manual therapy in management of LBP is to contribute in pain and stiffness reduction, improvement in flexibility which contributes to enhanced mobility, making it a valuable addition in rehabilitation and pain management strategy [5].

SNAGs have gained quite a recognition in rehabilitation approaches due to its potential to reduce pain levels and improve joint mobility. It involves a specific type of spinal mobilization where small gentle gliding movements are performed on facet joint surface combined with movement typically to improve ROM and alleviate pain. In SNAGs, the therapist applies controlled and gentle glides on to the apophyseal joint whilst the patient maintains a posture. This helps in pain relief and discomfort also caused due to restricted motion thus improving the mobility in conditions like facet joint dysfunction or in case of general stiffness. The main aim is to reduce pain, improve joint function and increase ROM [6].

This review aims at exploring the existing research on how SNAGs is used as treatment approach for MLBP with emphasis on its ability to alleviate pain and enhance mobility of spine, and to identify key outcome, mechanisms and the clinical relevance.

MATERIAL AND METHODS

This study was conducted following the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines [13] to ensure methodological rigor and transparency. The PRISMA flowchart (figure1) provides detailed overview of the study selection process.

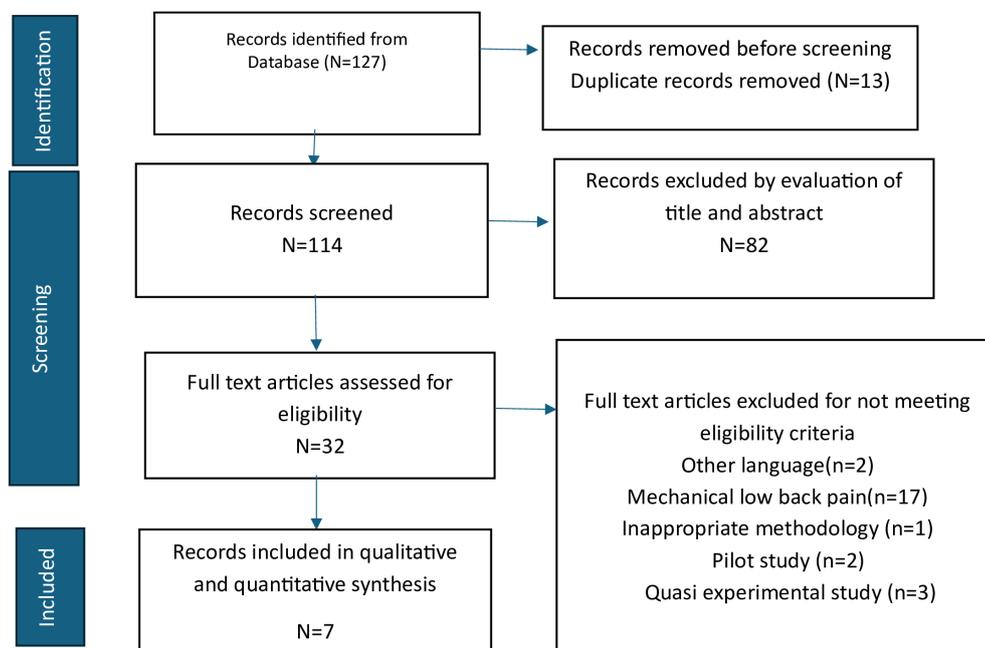


Figure 1: PRISMA flowchart

The review follows a narrative synthesis approach, systematically summarizing the relevant literature on the use of SNAGs for alleviating pain and improving mobility in mechanical low back pain. The following methodology was employed to identify, assess, and summarize the evidence.

Literature Search:

- **Databases:** A comprehensive search was conducted across the following electronic databases: PubMed, Scopus, Cochrane Library, and Google Scholar.
- **Search Terms:** The search strategy included a combination of Medical Subject Headings (MeSH) terms and Keywords such as “SNAGs mobilization,” “mechanical low back pain,” “facet joint mobilization,” and “manual therapy for low back pain”. Boolean operators (OR, AND) were used in various combinations to refine the results.
- **Inclusion Criteria:** Studies included in the review had to meet the following criteria:
 - Published between 2015 and 2025.
 - Focused on SNAGs as a primary intervention for mechanical low back pain.
 - Studies that report on pain intensity and/or mobility improvements as primary or secondary outcomes.
 - Randomized controlled trials (RCTs), comparative studies, and case reports were eligible for inclusion.

Exclusion Criteria:

- Studies that did not specifically address mechanical low back pain or did not involve SNAGS mobilization.
- Non-human studies (e.g., animal models) or studies that were not published in peer-reviewed journals.
- Articles that focused on acute low back pain or other non-mechanical causes of pain.
- Studies lacking the desired outcome
- Studies that involve language other than English

DATA EXTRACTION

The data extracted from each study were retrieved and include the citation details, participant characteristics, intervention specifics, outcome measures and key findings. This information was systematically gathered to assess the improvements in outcome measures and organized in a comprehensive summary, outlining study design, patient demographics, intervention details, outcome measures and conclusion (Table1). This table serves as valuable tool for comparing the effects of SNAGS on mechanical low back pain.

DATA SYNTHESIS

This review synthesizes findings from multiple studies examining the impact of SNAGS on alleviating pain and improving mobility in mechanical low back pain. The data extracted from selected studies were analyzed based on primary outcome measures: pain, range of motion and disability. The collective evidence highlights the potential of SNAGS in improving functional outcomes in mechanical low back pain.

Table 1: Characteristics of included studies

Author (Year)	Population characteristics	Intervention	Outcome measures	Result
Cankaya & Pala, [9]	46 Obese patients with mechanical low back pain for atleast 3 months	SNAG vs Sham Add more about intervention	Pain (VAS), ROM (DrGoniometer), disability levels (ODI)	The VAS showcased substantial decrease in Mulligan group in comparison to control group. Flexion and left rotation ROM had small effects whilst extension, right rotation, right lateral flexion and left lateral flexion had moderate effects.
Gohil et al., [10]	50 patients of both gender patient aged between 21 and 50 years having MLBP for less than 3 months	GroupA (SNAGS+ MulliganTaping) and Group B (SNAGS+ Kinesio taping)	NPRS, RMDQ, Modified Schober’s test	Effectiveness of SNAGS is enhanced with taping by improving proprioceptive feedback and spinal stabilization
Salik et al., [14]	45 participants of both the genders of 22-70 years age having no physical activity on a daily basis suffered from chronic LBP	SNAG vs McKenzie	NPRS, ODI, Goniometry	Both SNAGs and Mckenzie were beneficial in LBP. However, Mulligan SNAGs improved ROM and disability whereas Mckenzie showcased instant pain relief, improved disability but with short term effects.
Sharma et al., [15]	30 patients of Both gender athletes of 18-35 years with MLBP for 3 months	Group 1 SNAG +exercises, group 2 MET +exercises group3 exercises only.	VAS, leg dynamometer, EMG	Both groups show efficacy in pain reduction, improved ROM and back extensor strength. But MET in combination with exercise was better than SNAGS combined with exercises.
Ain et al., [7]	40 Females aged 20-60years experiencing MLBPformore than03months	SNAG vs thoracic Correction + snags	NPRS, ODI, Goniometry	Mulligan lumbar SNAGs were beneficial in pain reduction, improving functional independence and ROM in patients with MLBP but were effective and beneficial when combined with TPCT exercises.
Waqqar et al., [16]	37 Patients of both gender of age 30-70 years with minimum 4 weeks history of chronic MLBP	SNAG vs McKenzie	VAS, ODI, Inclinator	Mckenzie EEP are more beneficial for pain relief whereas SNAGs are more effective in enhancing spinal mobility.

RCT: Randomized controlled trial; LBP: Low back pain; MLBP: Mechanical low back pain; ROM: Range of motion; MET: Muscle energy technique; SNAGS: Sustained natural apophyseal glides; TPCT: Thoracic posture correction techniques; EEP: Extension exercises program

DISCUSSION

The most prevalent musculoskeletal condition adversely affecting the population worldwide is LBP. Amidst all the available physical therapy interventions, SNAGs tend to typically gain recognition due to its

efficacy in immediate pain relief, improved spinal mobility leading to overall elevated efficacy of functional outcomes. Several heterogeneous studies conducted have compared SNAGs with other therapeutic interventions including both modalities and hands on approaches highlighting its clinical relevance and implications. This discussion entails findings from various studies to provide an inference on efficacy of SNAGs as a reliable therapy in rehabilitation of MLBP.

Pain

The findings of various studies indicated that SNAGs prove to be beneficial in alleviating pain levels and providing relief in long term in individuals with MLBP. Cankaya & Pala, [9] found SNAGs to be very efficacious in comparison to strengthening exercises in easing pain levels in obese individuals with chronic MLBP. SNAGs lead to decrease pain perception by redistributing the spinal load, reduce mechanical stress and improve overall joint function. Also, Ain et al. [7] stated that SNAGs when integrated with thoracic posture correction technique (TPCT) provides more relief in pain than SNAGs alone, verifying the regional interdependence theory suggesting that correcting the thoracic positioning errors reduces the pain associated with lumbar spine.

Salik et al. [14] compared the effect of SNAGs with that of McKenzie exercise and concluded that McKenzie provides faster but short-term relief in pain whereas SNAGs provide long term pain reduction. This implies that McKenzie works on principle of centralization of pain whilst SNAGs deal with spine biomechanical dysfunctions and renders long lasting pain relief. This finding suggests that while McKenzie techniques centralize pain quickly, SNAGs address deeper biomechanical dysfunctions, leading to longer-lasting pain relief. And Al-Muhanna & Khan, [12] reported that SNAGs notably surpassed ultrasound therapy in providing pain relief by dropping the VAS from 7.61 ± 1.26 to 0.45 ± 0.47 . This concludes that SNAGs' manual mobilization has more considerable impact on reduction of pain levels in comparison to other therapeutic treatments involving ultrasound therapy.

In a study involving athletes as targeted population, Sharma et al. [15] stated that muscle energy technique (MET) enhanced muscle activation whereas SNAGs rendered pain levels in long term. This concludes that SNAGs may be an apt choice for general individuals with MLBP whereas MET is beneficial for the athletic population which requires enhanced and improved muscle activation for optimal recovery. Waqqar et al. [16] also found that McKenzie exercise provides instant and short-term pain relief but SNAGs provide long term relief in pain by targeting the root cause of pain rather than just centralising the symptoms which contributes in improved spinal mobility.

Gohil et al. [10] explored that integrating taping with SNAGs mobilization can contribute significantly in pain reduction. Both taping techniques consisting of mulligan taping and kinesio taping have same effect on pain levels when combined with SNAGs without any difference. Lastly the study concluded that proprioception and spinal stability is improvised by taping altogether contributing to alleviation of pain following the SNAGs mobilization.

Disability

Oswestry Disability Index (ODI) scale is used by all studies evaluating the effect of SNAGs on disability in individuals with MLBP. The findings tend to indicate that SNAGs contribute in enhanced functional independence when applied with other therapeutic interventions often outperforming or sometimes complementing them.

Cankaya & Pala, [9] examined the effect of SNAGs on disability in obese patients with MLBP and stated that SNAGs contribute significantly in reduction of disability while restoring lumbar spinal mobility compared to strengthening exercises. The author also stated SNAGs along with restoration of mobility also redistribute load on spine, making ROM even more efficient and smooth by reducing physical limitations caused due to excessive body weight. Ain et al. [7] investigated effect of SNAGs integrated with TPCT and found that combination of both interventions showcased greater reduction in disability compared to SNAGs alone. This finding supports the principle of regional interdependence theory suggesting that addressing the thoracic spine dysfunction leads to better functional movement of lumbar spine hence reducing the disability.

Salik et al. [14] compared the effect of SNAGs with McKenzie exercise and stated that both the interventions decrease the levels of disability significantly. McKenzie tends to decrease disability faster for short term period whilst SNAGs target more sustained function gains. This suggest McKenzie is beneficial for instant symptomatic relief but SNAGs contribute to long term reduction of disability by targeting the improvement of underlying joint dysfunctions. Also, Al-Muhanna & Khan, [12] suggested SNAGs easily outperformed ultrasound therapy by significantly reducing disability by dropping ODI scores from 40 ± 20.57 to 9 ± 4.69 , further providing evidence of SNAGs being more beneficial than the ultrasound therapy.

Sharma et al. [15] investigated the effect of SNAGs versus MET in athletic population and found MET directly impacts muscle activation and strength while SNAGs contribute in pain free movements and improved mobility. This further suggests that SNAGs are beneficial for general population and MET is for athletic population targeting more on enhanced muscle activation and control. Waqqar et al. [16] compared SNAGs with Mckenzie exercises and found that Mckenzie exercise offers instant reduction in disability whereas SNAGs provided long term improvement in functional movement, establishing role of SNAGs in not only management of symptoms but also its contribution in correction of spinal dysfunctions. Gohil et al. [10] evaluated the effect of SNAGs combined with mulligan vs kinesiotaping and concluded that both the taping methods contribute in improved function outcome and reduction of disability with no difference between the two techniques. The study also highlighted that taping enhances proprioception leading to better postural stability and long-term improvement in activities of daily living thus reducing the disability and its impact.

Range of motion

The findings of various studies indicated that efficacy of SNAGs on lumbar ROM in patients with MLBP to be efficient. Various findings indicate that SNAGs contribute drastically in improving mobility of spine showing surpassing results as compared to other therapeutic active intervention like MET and Mckenzie exercises.

Cankaya & Pala, [9] examined the effect of SNAGs on lumbar ROM of obese individuals suffering from chronic MLBP and found SNAGs to be more effective in enhancing the ROM in comparison to conventional treatment involving strengthening exercises. SNAGs contribute in restoring joint integrity and mobility thus reduce symptoms of stiffness and help in optimization of weight distribution across the lumbar spine. Ain et al. [7] stated the overall effect of SNAGs in combination with TPCT and stated that individuals undertaking both inventions together showed significant increase in ROM of lumbar spine thus leading to enhanced lumbar spine flexibility and mobility, thus influencing the potential use of TPCT as treatment approach for individuals with MLBP.

Salik et al. [14] compared SNAGs with Mckenzie exercise and found that Mckenzie provides immediate short-term increase in ROM of lumbar spine whereas SNAGs contribute in long term mobility and flexibility of spine over a period of time. Also, Al-Muhanna & Khan, [12] found SNAGs to be superior than ultrasound therapy in increasing lumbar ROM with the use of gentle gliding leading to improved lumbar joint mobility. This suggests that SNAGs can be provide superior or comparable results thus proving to a valuable manual therapy intervention to increase ROM of spine.

Sharma et al. [15] compared the effect of SNAGs versus MET in athletic population and concluded that MET had contributed in improved muscle activation and enhanced back strength and whilst SNAGs proved to be better at increasing lumbar ROM by repositioning joint surfaces with help of accessory gliding. This suggests that SNAGs are useful for individuals with stiffness and mobility restrictions and MET concerns more with athletic population which requires control and stability training by improving the proprioception. Waqqar et al. [16] also compared SNAGs with Mckenzie exercise and found not so distinct results, suggesting SNAGs as superior approach in comparison to latter in restoration of functional ROM of lumbar spine over a period of time and addressing the joint dysfunction, highlighting its effectiveness in long term.

Whilst the reviewed trials concluded SNAGs were extremely beneficial treating MLBP, some limitations must be acknowledged. The most notable problem is that most researches have small sample size thus limiting the number of participants limits generalizability. In addition to that most studies had short follow up duration typically from 4-6 weeks which does not gives credibility in long term use or somehow in case of recurrence. In spite the limitations, the current review promises beneficial clinical evidence of efficacy of SNAGs in a rehabilitation protocol, though future studies should have more focus on inclusion of larger population, long term trials with use of standardized methodologies to strengthen the validity of the findings. Finally, SNAGs provide a powerful yet smooth hands-on approach in treatment of pain and mobility improvement, which is consistent with modern rehabilitation approaches that values functional movement and patient tailored care. To attain its full potential, it must be integrated with comprehensive treatment plan involving posture adjustment techniques, exercise therapy and other standardized techniques. Thus, with correct application with patient centred strategy SNAGs have potential to improve quality of living and return to performing activities of daily living without any disability or discomfort.

CONCLUSION

To summarize, SNAGs tend to prove extremely effective and beneficial physiotherapeutic intervention for management of MLBP, offering both instant alleviation of pain and long-term improvement in functional outcomes. The ability of SNAGs to target proprioception and enhancing neuromuscular control by

correction of biomechanical imbalances allow in to seamlessly blend in with other physiotherapy techniques making it a valuable tool in a clinical practice thus reinforcing its role as an integral part of musculoskeletal rehabilitation of MLBP. Hence this review supports the efficiency of SNAGs as manual therapy approach beneficial for individuals with MLBP in alleviation of pain, enhancing mobility of spine and overall functional outcomes making it a valuable addition in field of physiotherapy. Unlike other passive therapeutic interventions, SNAGs encourage active patient participation paving way for more natural movements leading to potential long-term gains. They have also shown efficacy in variety of population ranging from obese to athletes proving their adaptability in addressing wide range of patient needs and can be tailored accordingly, validating it to be a one solution for all. The non- invasive approach of SNAGs has made it to be a suitable option for individuals with sensitivity to forceful manual techniques due to its subtle smooth pain free gliding technique.

Conflict of interest

No potential conflict of interest reported

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