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ASSESSING SHORT TERM OUTCOMES OF LUMBAR SPINE MANIPULATION FOR FACET JOINT DYSFUNCTION; A PRE-POST ANALYTICAL STUDY

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ABSTRACT

Background: Low back pain is an important health issue that is occasionally overlooked, lumbar facet dysfunction is a prevalent cause of low back pain. While spinal manipulation is often used in medical settings, little research has been done on the way it works to treat lumbar facet dysfunction. To evaluate the effects of a lumbar spine manipulation in a single session on pain intensity and functional mobility in patients diagnosed with lumbar facet dysfunction. Patients in the present investigation comprised 24 individuals with proven lumbar facet dysfunction. Range of motion (ROM), the patient Global impression of change (PGIC), and the Numeric Pain Rating Scale (NPRS) were all employed to assess pain intensity before and following treatment. Means and Standard deviation were calculated. Matched sample statistics were among the statistical analyses. Each participant had a limited range of motion prior to therapy and 75% reported moderate to severe discomfort. After therapy, 79.1% reported little to no pain and 83.3% reported no limitations in function. While ROM increased from a uniform limitation to a mean score of 1.83, the average NPRS score dropped significantly from 3.17 to 2.00. However, 83.3% of patients stated that they felt "much better" after therapy. Pain score before and following treatment show a significant correlation ($r = 0.708$, $p < 0.001$), as well as limited range of motion ($r = 0.430$, $p < 0.001$). In patients with lumbar facet dysfunction, an individual lumbar spine manipulation treatment significantly improved pain levels, functional mobility and patient-perceived medical treatment. The findings indicate that spinal manipulation can improve their quality of life for patients with facet related low back pain while promoting it as an effective conservative therapy preference.

Keywords: *Lumbar Spine Manipulation, Facet Joint Dysfunction, Conservative Management, Numeric Pain Rating Scale (NPRS), Patient Global Impression of Change (PGIC)*

INTRODUCTION

Facet joint dysfunctions, the muscle imbalance or the disc's related problems are frequently linked with unilateral low back pain, a disorder in which discomfort is limited to one side if the lower back (Selhorst & Selhorst 2015). The stiffness, a soreness and the reduced mobility that people with unilateral low back pain frequently suffer can make daily tasks challenging. Persistent symptoms can

lead to chronic pain and this worsens a person quality of life and productivity at the work (Assendelft et al., 2003). In the United States, low back pain costs around $1000 billion each year, primarily because of missed work, medical bills and disability related cost. Facet joint discomfort is a common cause of chronic back pain, but it can be difficult to diagnose due to limitations in imaging techniques and clinical assessments. People having chronic pain take responsibility for a substantial portion of the financial burden. Spinal manipulation therapy is one of the most commonly used conservative treatment methods for low back pain due to its widespread prevalence. It is estimated that roughly 18 million Americans receive spinal manipulation therapy annually, highlighting its acceptance as a noninvasive therapeutic approach (Manchikanti et al., 2016; Thomas et al., 2020).. According to worldwide estimates, nearly 60–70% of adults will experience low back pain at some point in their lives, and a substantial portion will suffer from chronic or recurring episodes (de Faria et al., 2022). Low back pain may result from several disorders, including degenerative disc disease, muscular strain, facet joint dysfunction, and herniated discs. Identifying the specific cause can be challenging due to limitations in imaging and clinical evaluation, with controlled diagnostic blocks being the most effective technique for determining facet joint pain (Manchikanti et al., 2016). The manual therapy approach known as lumbar spine manipulation, which involves applying controlled, high-velocity thrusts to the lumbar joints, is one of the most widely used conservative therapies for lumbar facet dysfunction and low back pain. This technique which is frequently used in physiotherapy and chiropractic care, show significant success for improving joint mobility, lowering pain and enhancing general functions (Selhorst & Selhorst, 2015). Studies indicates that by targeting the neurophysiological mechanism related to managing pain and recovery from functions, spine manipulation can help with acute, subacute and chronical spinal pain. Given its widespread adoptions, clinical guidelines offer conflicting evidence about the efficacy of limber spine manipulation. As some doubt its benefit on its own other are advocate combining it with other conservative treatments (Gevers-Montoro et al., 2021) (de Zoete et al., 2021) conducted an individual participant data (IPD) meta-analysis including 4,223 patients from 21 RCTs (out of 42 eligible trials). SMT showed comparable effects to recommended treatments, with a mean pain difference of −3.0 and a standardized mean difference of −0.2 for function after one month. Outcomes were consistent across different comparisons (recommended vs. non-recommended treatments, SMT as adjunct therapy, mobilization vs. manipulation). However, data for SMT versus sham manipulation was insufficient. Overall, SMT provided similar benefits to standard treatments for chronic LBP, supporting its role as a viable management option. (de Zoete et al., 2021)

METHODOLOGY:

The study design was a pre-post analytical study as in this study, participants were assessed before (pre) and after (post) treatment for objective and subjective outcomes in single session. The intervention included lumbar spine manipulation by expert physiotherapist therefore making it analytical study design measuring pre-post outcomes The total sample size of our study was 24. Population was selected through convenient sampling. Numeric pain rating scale (NPRS) (Loreto et al., 2024), PGIC (patient global impression of change) (Childs et al., 2005), ROM of lumbar spine through goniometer The study was conducted at Akbar Medical Center The statistical analysis for this research study was conducted using the SPSS version 29. Frequency and percentages were calculated for demographic data and paired T test was applied for interferential statistics for measuring objective outcomes i.e., Pre and Post effects on lumbar manipulation on patients.2.

Inclusion criteria

- Adult aged 18 to 45 years.
- Both male and female were included.
- Clinically diagnosed patient with lumbar facet dysfunction.
- The ability and willingness to participate in both pre- and post-assessments on the same day.

Exclusion Criteria

- Presence of neurological disorders, radicular pain, or other signs of disc-related pathology.
- Any person who had any kind of major surgery e.g. appendicitis within the time period of 3 to 6 months won't be included.
- Patients who have any difficulty lying in the side-lying or prone position.
- Contraindications to spinal manipulation (e.g., osteoporosis, spinal instability and anyone with scoliosis or increased cobb angle).

- Pregnant individuals or patients with psychological conditions affecting their ability to consent or participate.

Any systemic disease that can cause localized back pain.

RESULTS

Figure 2 frequency table of different age categories

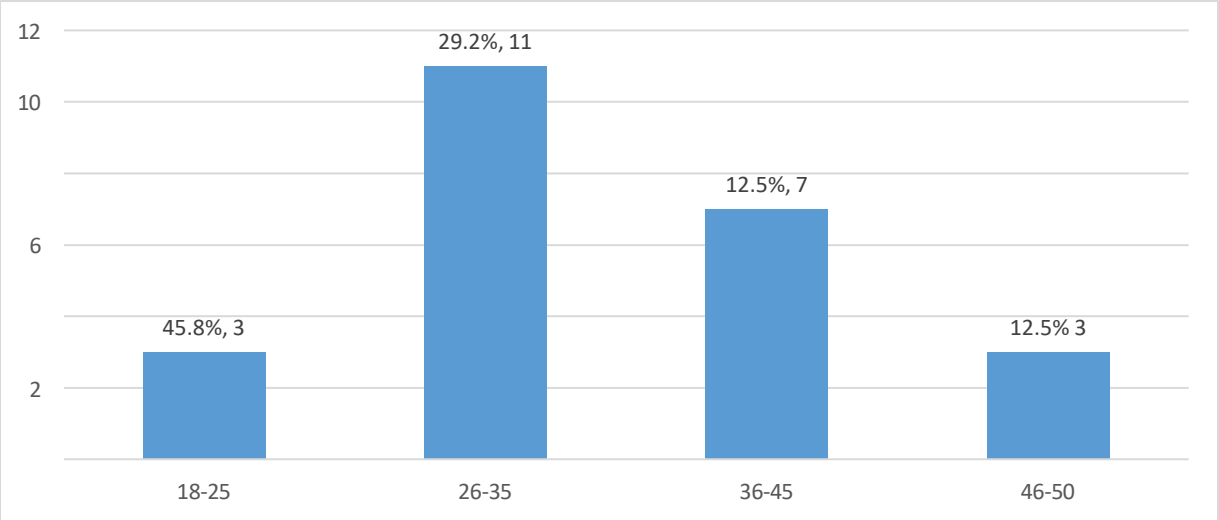


Figure 4 pre numeric pain rating scale

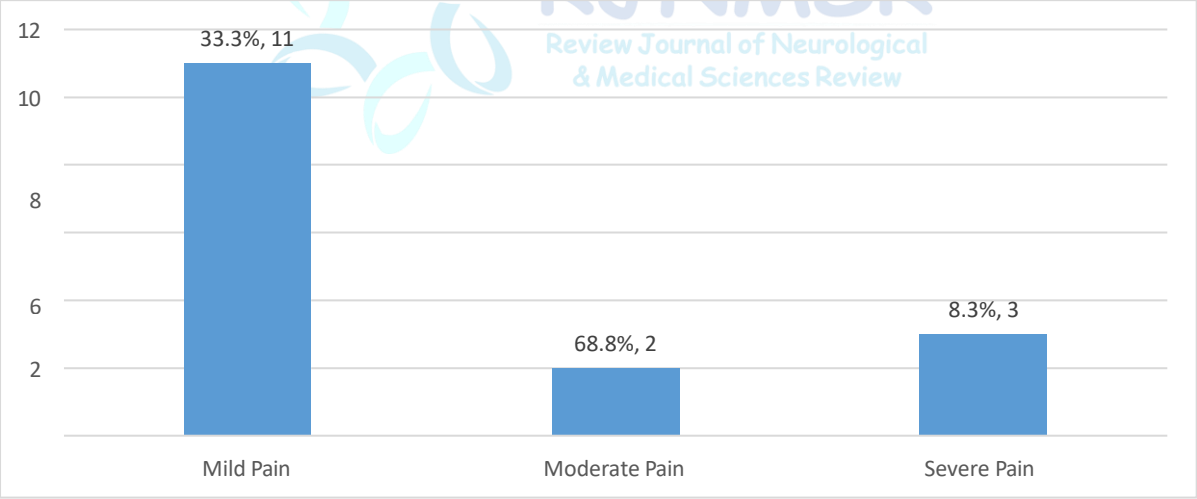
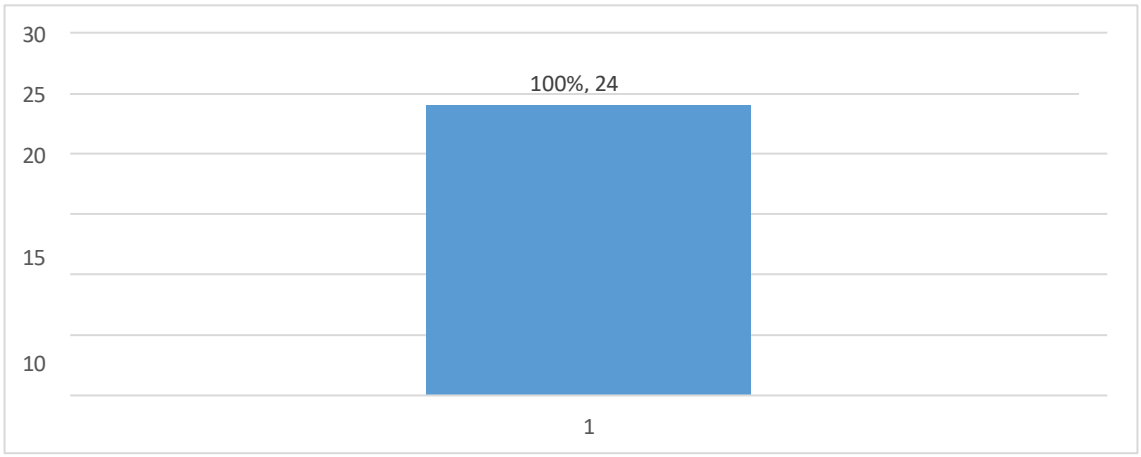


Figure 5 pre-treatment range of motion



Post treatment

Figure 6 post numeric pain rating scale

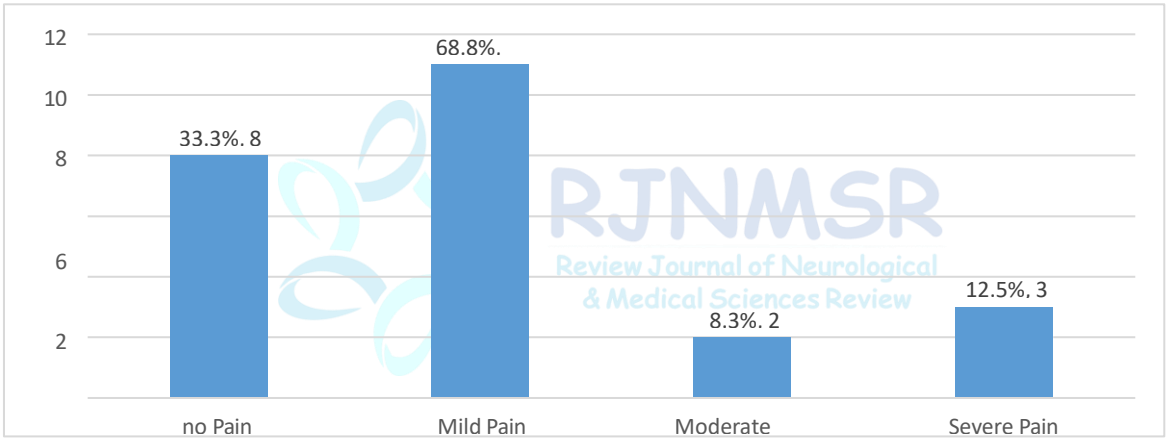


Figure 7 post-treatment range of motion

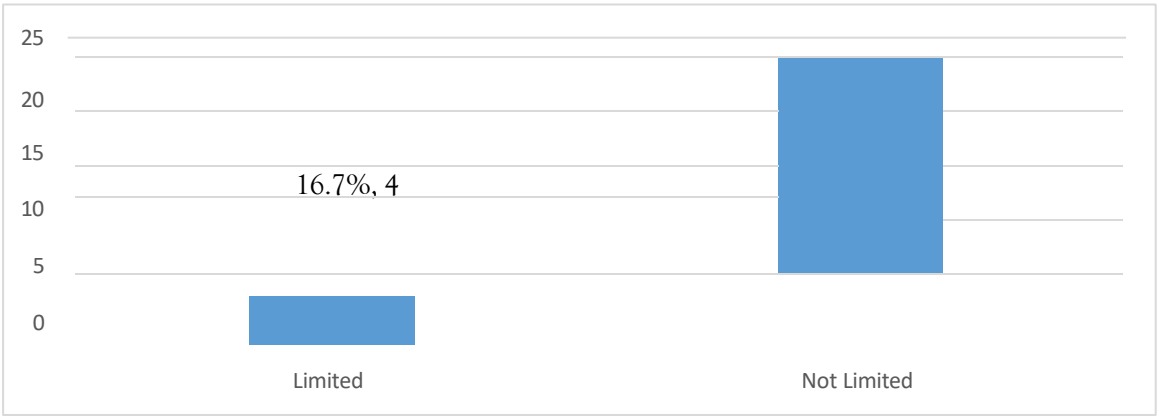
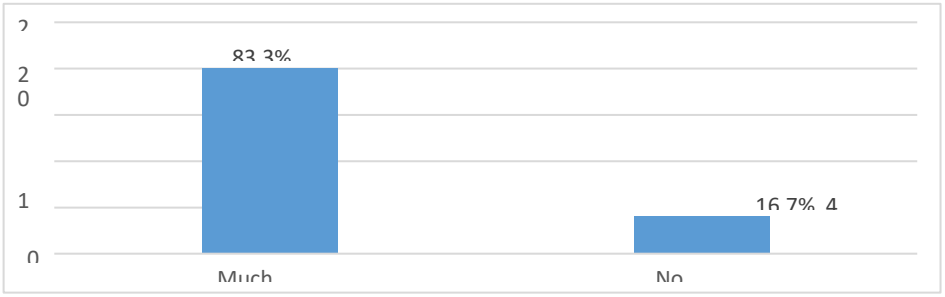


Figure 8post-patient global impression of change



Interferential Statistics:(Paired samples t-test)

Table 1 paired sample correlation

Paired Samples	Mean	Std. Deviation	Std. Error Mean	95% CI Lower	95% CI Upper	t	Df	Sig. (2-tailed)
Pre-post Numeric Pain Rating Scale	1.167	0.702	0.143	0.87	1.463	8.142	23	<.001
Pre-Post Range of Motion ROM	-0.833	0.381	0.078	-0.994	-0.673	-10.72	23	<.001

DISCUSSION

De Faria et al. (2022) In their comprehensive review, examined the effects of neural mobilization on patients with persistent low back pain and found that it considerably improves functional capacity and relieves pain. These findings are closely supported by current study, which showed that patients who after receiving manual treatment, including mobilization techniques, saw a significant decrease in pain intensity and functioning. Gladney and Vander Zed (2021) effectiveness of spinal manipulation therapy in reducing pain and increasing mobility in people with low back disorders was investigated by Gladney and Vander Zed (2021). According to their findings, spinal manipulation clearly helps to reduce pain and improve functional results. All patients experienced limited mobility prior to therapy, and more than 75% of them reported moderate to severe pain. Following the intervention, range of motion was considerably enhanced as indicated by higher post-treatment mobility, and pain scores on the Numeric Pain Rating Scale dropped from a mean of 3.17 to 2.00. Additionally, 83.3% of patients reported feeling "much better" in their subjective global perception of change, which is consistent with the good results emphasized by Vander Zed and Gladney. These consistent findings from various trials support spinal manipulation as a safe, efficient treatment for persistent low back pain that enhances patients' quality of life. When Oh et al. (2020) looked into manual manipulation therapy for individuals with lumbar spinal stenosis, they found that both pain and functioning significantly improved. Similar patterns were noted even though our patient group comprised general cases of persistent low back pain. Our results showed that 75% of patients had moderate to severe pain at first, but that this drastically changed following treatment, with 83.3% reporting full return of functional capacity and 79.1% reporting just little or no pain. The patient-reported improvement in our group, where 83.3% reported feeling "much better," supports Oh et al.'s focus on the importance of manual manipulation in improving quality of life. These findings imply that manual manipulation's therapeutic benefits extend beyond particular diseases and can be widely used to treat a range of lumbar disorders that impair function.

CONCLUSION

After analyzing the results, it can be concluded that the treatment was effective in reducing pain and improving patients' mobility and overall well-being. 83.3% reported feeling much better, with reduced pain which is a significant improvement with $p<0.01$, thus accepting the null hypothesis. 83.3% individuals reported in improved functional limitations. Their ability to move, especially in terms of range of motion, also improved noticeably. These improvements reflect that the intervention provided real and meaningful relief from symptoms and helped patients return to better daily function.

Limitations

- Comparatively small sample size (n = 24) limits the statistical power of the analysis and narrows the potential for generalization.
- Using single treatment session is not representative of long-term clinical practice, in which prolonged outcomes need several sessions.
- The study utilized only short-term follow-up, thus the long-term sustainability and persistence of effects of lumbar spine manipulation cannot be known.

REFERENCES

Assendelft, W. J., Morton, S. C., Yu, E. I., Suttorp, M. J., & Shekelle, P. G. (2003). Spinal manipulative therapy for low back pain: a meta-analysis of effectiveness relative to other therapies. Annals of internal medicine, 138(11), 871-881.

Clark, B. C., Russ, D. W., Nakazawa, M., France, C. R., Walkowski, S., Law, T. D., Applegate, M., Mahato, N., Lietkam, S., & Odenthal, J. (2018). A randomized control trial to determine the effectiveness and physiological effects of spinal manipulation and spinal mobilization compared to each other and a sham condition in patients with chronic low back pain: Study protocol for The RELIEF Study. Contemporary clinical trials, 70, 41-52.

de Faria, S. C. S., Vilella, R. C., Guimaraes, L. H. d. C. T., & Lunkes, L. C. (2022). Effects of neural mobilization in the treatment of chronic low back pain: a systematic review. Iberoamerican Journal of Medicine, 4(3), 157-163.

Gevers-Montoro, C., Provencher, B., Descarreaux, M., Ortega de Mues, A., & Piché, M. (2021). Clinical effectiveness and efficacy of chiropractic spinal manipulation for spine pain. Frontiers in pain research, 2, 765921.

Manchikanti, L., Hirsch, J. A., Falco, F. J., & Boswell, M. V. (2016). Management of lumbar zygapophysial (facet) joint pain. World journal of orthopedics, 7(5), 315.

O'Donnell, M., Smith, J. A., Abzug, A., & Kulig, K. (2016). How should we teach lumbar manipulation? A consensus study. Manual Therapy, 25, 1-10.

Oh, H., Choi, S., Lee, S., Lee, K., & Choi, J. (2020). The effects of manual manipulation therapy on pain and dysfunction in patients with lumbar spinal stenosis. Journal of Physical Therapy Science, 32(8), 499-501.

Selhorst, M., & Selhorst, B. (2015). Lumbar manipulation and exercise for the treatment of acute low back pain in adolescents: a randomized controlled trial.

Journal of Manual & Manipulative Therapy, 23(4), 226-233.

Taşkaya, B., Taşkent, İ., Çakıllı, M., & Yılmaz, Ö. (2024). The Effect of Manual Therapy on Psychological Factors and Quality of Life in Lumbar Disc Herniation Patients: A Single Blinded Randomized Clinical Trial.

International Journal of Environmental Research and Public Health, 21(9), 1234.

Thomas, J. S., Clark, B. C., Russ, D. W., France, C. R., Ploutz-Snyder, R., Corcos, D. M., & Investigators, R. S. (2020). Effect of spinal manipulative and mobilization therapies in young adults with mild to moderate chronic low back pain: a randomized clinical trial. JAMA network open, 3(8), e2012589e2012589.

Van Oosterwyck, W., Vander Cruyssen, P., Castille, F., Van de Kelft, E., & Decaigny, V. (2024). Lumbar Facet Joint Disease: What, Why, and When? Life, 14(11), 1480.

Wong, E., Lee, W. T., Chau, C., Cheng, H. Y., & Kwok, R. (2023). Comparison of Effectiveness of Chiropractic Spinal Manipulation and Conservative Therapy for Low Back Pain. Journal of Orthopedics and Sports Medicine, 5(1), 1-8.

Woodhead, T., & Clough, A. (2005). A systematic review of the evidence for manipulation in the treatment of low back pain. Journal of Orthopaedic Medicine, 27(3), 99-121.

Bond, B. M., Kinslow, C. D., Yoder, A. W., & Liu, W. (2020). Effect of spinal manipulative therapy on mechanical pain sensitivity in patients with chronic nonspecific low back pain: a pilot randomized, controlled trial. Journal of Manual & Manipulative Therapy, 28(1), 15-27.

Childs, J. D., Piva, S. R., & Fritz, J. M. (2005). Responsiveness of the numeric pain rating scale in patients with low back pain. Spine, 30(11), 1331-1334. de Zoete, A., Rubinstein, S. M., de Boer, M. R., Ostelo, R., Underwood, M., Hayden, J. A., Buffart, L. M., van Tulder, M. W., Bronfort, G., & Foster, N. (2021). The effect of spinal manipulative therapy on pain relief and function in patients with chronic low back pain: an individual participant data metaanalysis. Physiotherapy, 112, 121-134.

Ghasabmahaleh, S. H., Rezasoltani, Z., Dadarkhah, A., Hamidipanah, S., Mofrad, R. K., & Najafi, S. (2021). Spinal manipulation for subacute and chronic lumbar radiculopathy: a randomized controlled trial. The American journal of medicine, 134(1), 135-141.

Lo, C. N., Ng, J., Au, C. K., & Lim, E. C. W. (2019). The effectiveness of spinal manipulation in increasing muscle strength in healthy individuals: a systematic

review and meta-analysis. Journal of Manipulative and Physiological Therapeutics, 42(2), 148-158.

Loreto, A., Lohman, E., Gharibvand, L., Lohman, T., & Lee, B. (2024). The Effects of Cervical Spine Mobilization versus Manipulation on Pain, Disability, and Satisfaction in Subjects with Non-specific Mechanical Neck Pain. Physical Therapy Rehabilitation Science, 13(3), 261-273.

Loss, J. F., da Silva, L. d. S., Miranda, I. F., Groisman, S., Neto, E. S. W., Souza, C., & Candotti, C. T. (2020). Immediate effects of a lumbar spine manipulation on pain sensitivity and postural control in individuals with nonspecific low back pain: a randomized controlled trial. Chiropractic & Manual Therapies, 28, 25.

Nim, C. G., Kawchuk, G. N., Schiøttz-Christensen, B., & O'Neill, S. (2020). The effect on clinical outcomes when targeting spinal manipulation at stiffness or pain sensitivity: a randomized trial. Scientific Reports, 10(1), 14615.

Rubinstein, S. M., De Zoete, A., Van Middelkoop, M., Assendelft, W. J., De Boer, M. R., & Van Tulder, M. W. (2019). Benefits and harms of spinal manipulative therapy for the treatment of chronic low back pain: systematic review and meta-analysis of randomised controlled trials. bmj, 364.

Suzuki, H., Aono, S., Inoue, S., Imajo, Y., Nishida, N., Funaba, M., Harada, H., Mori, A., Matsumoto, M., & Higuchi, F. (2020). Clinically significant changes in pain along the Pain Intensity Numerical Rating Scale in patients with chronic low back pain. PloS one, 15(3), e0229228.

Van Oosterwyck, W., Vander Cruyssen, P., Castille, F., Van de Kelft, E., & Decaigny, V. (2024). Lumbar Facet Joint Disease: What, Why, and When?

Life, 14(11), 1480.

Wu, S., Jinghua, G., Liguo, Z., Baojian, W., Kexin, Y., Wei, X., & Zhenzhong, W. (2020). Effect of spinal manipulation on degenerative scoliosis. Journal of Traditional Chinese Medicine, 40(6)