

# A Case Report on Effect of Tailor-Made Spine Physiotherapy Protocol for Resident Doctor

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## Abstract

**Background and purpose:** Neck Pain and Low Back Pain are most prevalent musculoskeletal pain among medical students. This is due to long training hours of ward and clinics for clinical exposure, elective rotations and research electives carried out in residency program. Common Quality of Life problems reported by medical students are associated with neck and lower back pain which include headaches and pain during reading, standing and sitting.

**Intervention:** We herein present the case of 27-year-old resident doctor with generalized weakness, stiff neck with restricted ranges and chronic low back pain with tingling in lower limb. He was rehabilitated with customized physiotherapy protocol consisting of myofascial release of tight structures with stretching exercises, strengthening of weaker structures and endurance training to improve cardiorespiratory performance for 2 weeks, 6days/week, 60mins/day.

**Outcomes:** An overall improvement in functional performance was reported post treatment using exercise therapy and electrotherapy with decreased pain and increased ranges and strength.

**Discussion and conclusion:** This study showed that there was significant improvement in pain after proper exercises, awareness of body mechanics and ergonomic changes.

**Keywords:** neck pain, low back pain, post graduate medical student, case report, stiffness, trigger point, mechanical pain

## Introduction

The medical school application and training process is demanding, with many medical students experience great deals of both physical and emotional stress<sup>[1]</sup>. The principal aims of a medical school are to produce capable, professional doctors and promote health care of society<sup>[4]</sup>. But during the medical training period, faced with stress, learning problems, long training hours in hospital wards and clinics; in addition to the increasing use of computers in teaching and learning, thus it is considered a risk factor that can increase the prevalence of musculoskeletal pain among medical students<sup>[2]</sup>. The reported prevalence of musculoskeletal disorder (MSP) and lower back pain medical student was between 45.7% and 65.1%<sup>[3]</sup>.

Low back pain (LBP) is defined as pain, muscle tension or stiffness localised below the coastal margin and above the inferior gluteal folds, with or without leg pain (sciatica). The most important symptoms of non-specific low back pain are pain and disability<sup>[5]</sup>. The vulnerability of medical students due to stress and numerous hours of studying and training makes them at risk of LBP. The onset of LBP is believed to be influenced by factors including frequent repetitive movements of a particular body part and positions like prolonged standing or sitting. However, the most important factors that favour the occurrence of LBP and its transition to chronicity are stressors, fear of pain, and lack of physical activity<sup>[3]</sup>.

Medical students seemed to have a higher risk of developing neck pain compared to the general population. Neck pain has a multi-factorial origin, and there are several factors contributing to its onset and perpetuation<sup>[4]</sup>. High reports on computer use are estimated among post-graduate students because they carry out further education and require report writing and research to complete the master's program. Prolonged use of the computer and sitting with rounded shoulders and wrong neck posture disturbs the normal lordotic curve of neck which causes muscle imbalance and consequently neck pain<sup>[2]</sup>.



**Figure 1:** Posture evaluation in all planes (lateral, posterior and anterior respectively).

## Case Presentation

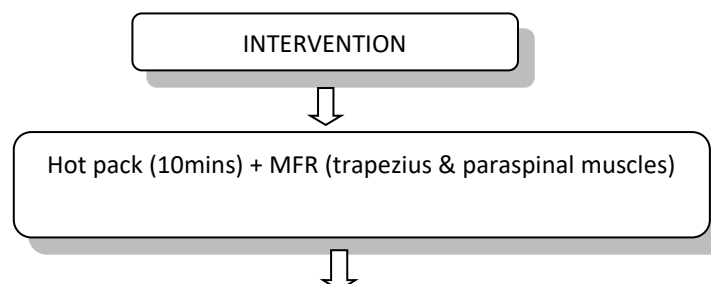
### History

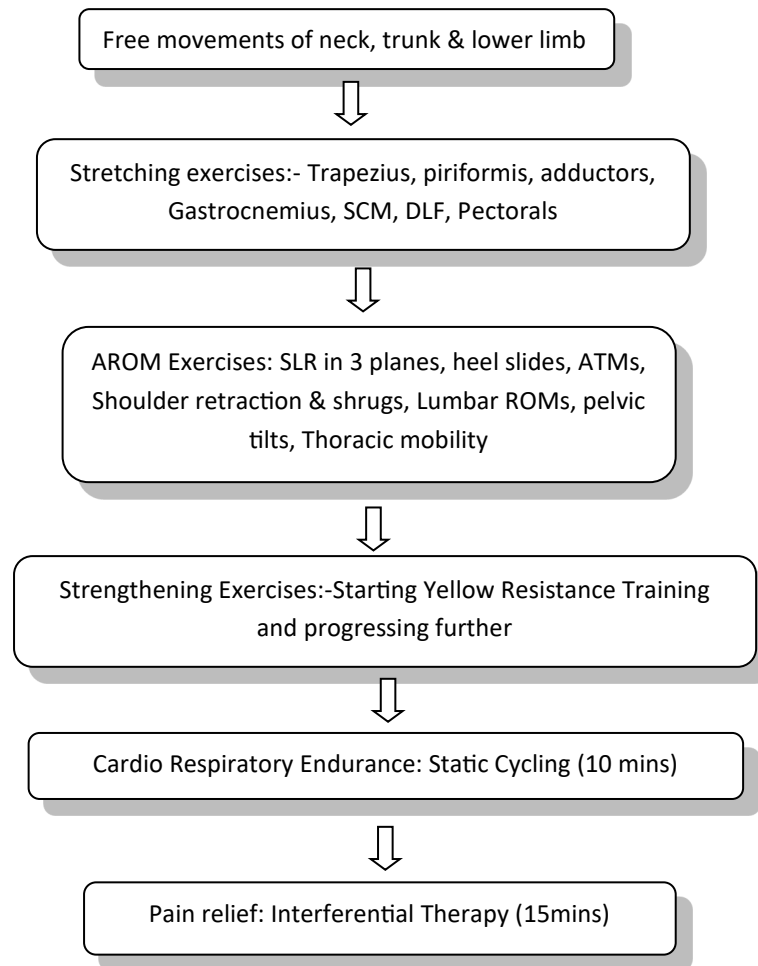
A 27 year old physically active resident doctor, 164 cm in height and 82 kg in weight was referred for physical therapy with chief complaint of unilateral right side neck stiffness and lower back pain. He also complained about continuous tingling in his both lower limbs localized to only ankle and foot region. He could not remember any trauma or acute injury to his neck and lower back. He reported that he developed similar right sided pain in neck and lower back since 2016; however, this episode of lower back pain and neck stiffness was worse than his previous episode. The patient reported that his preferred sleeping posture was by sitting on chair with slouched posture due to his hectic schedule. He also reported that his work result in increase in pain especially while standing with increasing stiffness neck and tingling in ankle and foot region. Sitting was not painful but sometimes he experienced occasional pain when he moved sitting to standing. Patient also reported he could not walk distance greater than 0.4km due to pain.

### Physical Assessment and Examination

On the first day the patient was seen in therapy, he perceived his low back pain as severe and neck stiffness with restricted range of motion. This assessment was based on Neck Disability Index (NDI) and PF-36. Visual inspection of the standing showed no apparent deformity of cervical and lumbar spine in sagittal and frontal plane. Active movements were assessed to obtain gross assessment of cervical and lumbar spine active range of motion to determine which specific movement produced pain. Patient reported that his cervical flexion, right lateral flexion, and right rotation were painful and had restriction whereas forward bending was comparatively more painful than backward bending. Forward bending was not smooth with evident muscle guarding. Side bending on either side was also painful with VAS 6/10. On checking tightness, patient reported right hamstring, piriformis and TA tight with right SCM and trapezius tight. On palpation, patient reported trigger points in trapezius and lumbar region at level L2-L5. Tenderness was noted over calf muscles i.e gastrocnemius which increased tingling in both lower limbs. Left SLR measured was painless for 30° whereas right side reported pain at 10°.

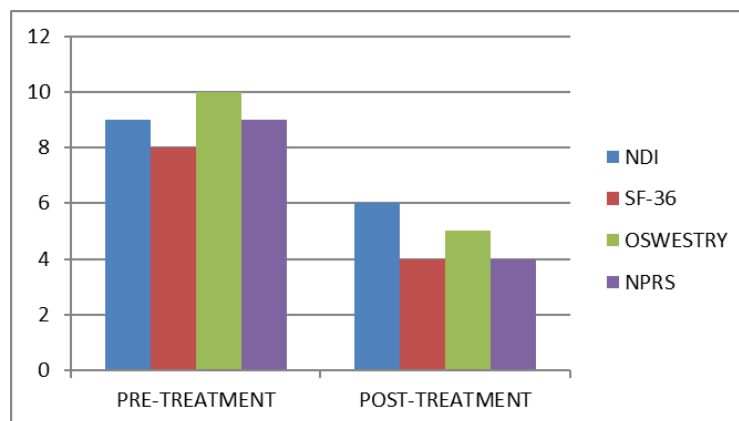
### Therapeutic Intervention





**Flowchart 1-** Tailor-made Physiotherapy protocol for Spine.

### Outcomes And Analysis



**Graph 1-** Bar graph for Pre and Post Treatment.

This bar chart based on outcome measures illustrate the difference in pre and post physiotherapy treatment. The outcome measure like NDI (Neck Disability Index) showed significant improvement in pain by decreasing the score to 6 from 9 after treatment. Higher the score greater the disability and severity. SF-36 a popular instrument for evaluating Health-Related Quality of Life also showed improvement in functional status on discharge. Oswestry Disability Index (ODI) is a popular condition specific outcome measure for spine disorders. It gives a subjective percentage score of level of disability in activities of daily living in those rehabilitating. Initial score was 5\5 whereas at discharge it was significantly reduced to 3. NPRS (Numerical Pain Rating Scale) initial rated 9/10. After intervention the score reduced to 4/10 which indicated pain reduction.

## Discussion

This is the primary study that investigated how resident doctors have high prevalence of neck pain and low back pain that occurred with regular frequency. Subject data were processed by using Neck disability index, SF-36, Oswestry Disability Index. In medical students owing to excessive time spend on slumped posture while using computer or during OPD duty associated with neck flexion is reported. Excessive neck flexion increases muscle activity of upper trapezius and neck muscles along with shoulder discomfort. Besides these factors predisposing to pain, students under residency program subject themselves to prolonged hours of reading, writing and in clinical practice which makes them high risk group for neck pain.<sup>1</sup> A study in 2017 showed that there was evidence of 54% medical students with neck pain and low back pain which exacerbated with standing being associated with quality of life<sup>[1]</sup>. In contrast the medical student who did regular exercise and walking for at least 20 minutes a day can significantly improve neck pain and back pain. Patient was rehabilitated with customized physical therapy including exercises, electrotherapy, and myofascial release technique. There was a significant improvement in pain. A study in 2020 showed that medical students who did regular physical exercise can strengthen, lengthen, improve flexibility and make their muscles and ligaments strong to support and keep the neck alignment for proper functioning and preventing injury<sup>[4]</sup>. It was noted that low back pain has a significant repercussion on daily performance of medical students personal life and sleep quality. This study showed that proper exercises, awareness of body mechanics and ergonomic factor can prevent musculoskeletal pain and reduce consumption of analgesics.

## Conclusion

The findings of this study provide significant evidence to suggest that tailor made spine exercise protocol can improve overall strength, functional status and quality of life of resident doctors with neck and back pain.

## Further Scope of Study

A randomised controlled clinical trial can be done on medical students to evaluate effectiveness of a spine fitness exercise regime.

## Conflict of Interest

The authors declare no conflict of interest.

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