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Original Article

# EFFECTS OF NEURAL MOBILIZATION IN POSTERIOR MYOFASCIAL CHAIN FLEXIBILITY IN NORMAL SUBJECTS

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## ABSTRACT

**Aims and objectives:** The aim of this research is to see the effectiveness of neural mobilization on posterior myofascial chain flexibility.

**Methodology:** Samples of 70 subjects were recruited for the study. Pre mobilization readings for finger floor distance, tibiotarsal angle and finger floor grades were taken for each individual, after whom slump mobilization was given and post mobilization readings were again taken in the same sequence after mobilization.

**Results:** Both finger floor distance and grades were significantly changed, while tibiotarsal angle showed no significant difference.

**Discussion:** Neural mobilization tries to restore the nervous system's movement and elasticity, rehabilitating its normal functions by relieving the tensions in the muscular chains thereby increasing its flexibility.

**Conclusion:** This study concludes that neural mobilization can improve posterior myofascial chain flexibility.

**KEY WORDS:** Myofascial Chain, Neural Mobilization, Slump, Flexibility.

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## INTRODUCTION

The human posture comprises of fascias, muscular chains, ligaments, and bone structure, which are interconnected and constitutes the whole body. Any alterations in each of these structures can cause a postural disequilibrium not only in the above prescribed zones, but also in the muscular chains of the individual, since some initial tension can lead to a series of combined tension [1].

This tension in the myofascial chains may cause or may be caused by the improper mechanical and physiological responses in the nervous system, leading to changes in the elasticity and amplitude of movements, according to Butler [2]. Whereas, flexibility is related to the extensibility of musculotendinous units that cross a joint, based on their ability to relax or deform and yield to a stretch force [3].

Adverse neural tension can be described as abnormal physiological & mechanical responses produced from the nervous system structures when their normal range of motion and stretch capabilities are tested [4].

The nervous system adapts to and mechanically controls movement in two ways that invariably overlap:

1. By the development of pressure or tension within the system
2. By movement relative to its mechanical interface [4]

Considering that the nervous system is a continuous tissue that adapts itself to the body movements, this adaptability can be transmitted to the whole body system. Therefore, any change that alters its morphology may be transmitted through it and even result in dysfunctions in musculoskeletal structures which receive innervation [1].

Substantial mobility in the nervous system is needed for an individual to move during functional activities. The nervous system possesses a natural ability to move and withstand mechanical forces that are generated by daily movements. This capacity is essential in the prevention of injury and malfunction. The neural mobilization causes the return of the normal functions since it is a technique that restores movement and elasticity of the nervous system [2].

Neural mobilization can be used for both evaluation and treatment purposes, when it is used in the treatment; its main purpose is to re establish the dynamic equilibrium of the neural tissues, normalizing its physiologic function [1]. The nervous system can be effectively and safely mobilized, the ultimate aim of treatment is to restore the patient's range of nervous system movement & stretch capabilities and to normalize the sensitivity of the system [5-11].

However, limited evidence exists to support the effectiveness of using the neural mobilization as a treatment approach and has only been presented in the form of case reports or case studies. Because of the small number of researches in this field and considering the relation between neural connective tissue and underlying tissue, the main objective of this research was to evaluate the posterior myofascial chain's flexibility after neural mobilization.

## METERIALS AND METHODS

A sample of 70 subjects was recruited for the study after taking the informed consent. Pre mobilization readings for finger floor distance, tibiotarsal angle and finger floor grades were taken for each individual, after whom slump mobilization was given and readings were again taken in the same sequence after mobilization. Each participant was given 1 minute continuous sustained stretch in slump position.

**Inclusion Criteria:** Following was the inclusion criteria for subjects- Age: 18 to 30 years, Gender: females, Asymptomatic individuals, Grade 1 to 7 on finger floor test.

**Exclusion Criteria:** Following was the exclusion criteria**-** The presence of any congenital or acquired deformity of vertebral column**,** Systemic disorders**,** Pregnancy**,** Piriformis syndrome**,** Any traumatic injury or surgery of spine, upper limb and lower limb, back pain.

**Procedure**

70 subjects were screened based on the inclusion & exclusion criteria. An informed consent was obtained from each subject participating in this study & the procedure was explained to the participants.

In the first step, pre mobilization readings of all the participants with goniometer and inch tape were taken, for tibiotarsal angle & finger to floor distance in two different positions. After that 1 minute slump stretching was given & then post mobilization readings were taken in the same sequence & positioning. For measurement of tibiotarsal angle, fibular head, lateral malleolus & fifth metatarsal were taken as reference points & markings were done accordingly [12,13]. For measurement of finger floor distance, distance between the tip of middle finger & floor was measured [15].

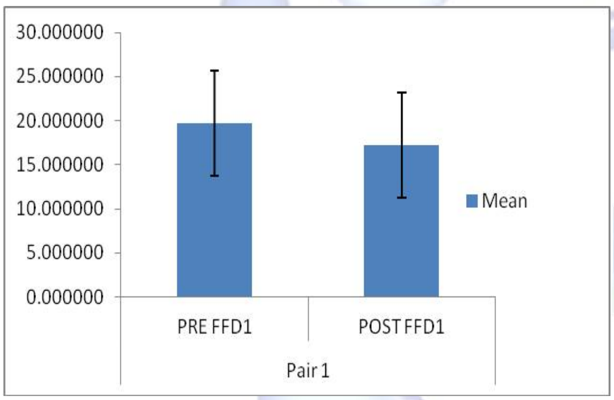
Finger floor distance was taken in two positions, first with cervical column relaxed and then with cervical column bent to increase the neural tension. The duration of the procedure for each participant was 10 minutes

**Fig. 1:** Half Circle goniometer used to measure the ROM.

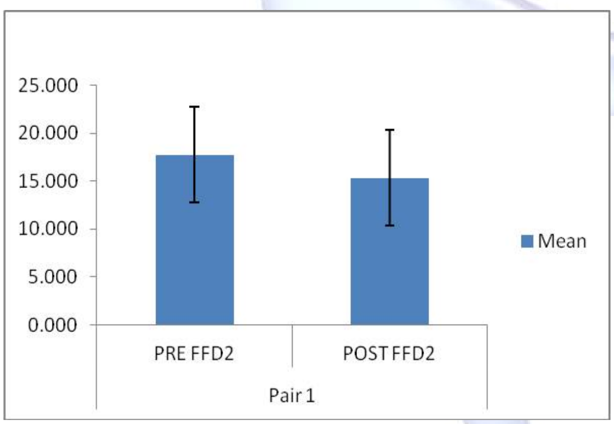
**Fig. 2:** Inch tape used for the study.

**Data Analysis:** In order to compare variables between two periods (pre and post mobilization) paired t test was used in which mean & standard deviation (Mean±S.D) of the variables were calculated. The significant level is $p<0.05$.

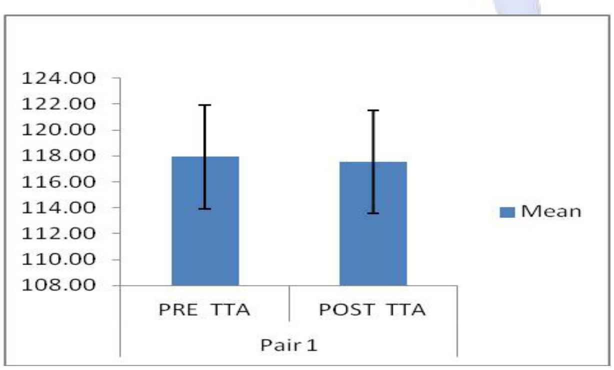
**Graph 1:** Comparison of mean standard deviation of pre and post intervention for FFD1.



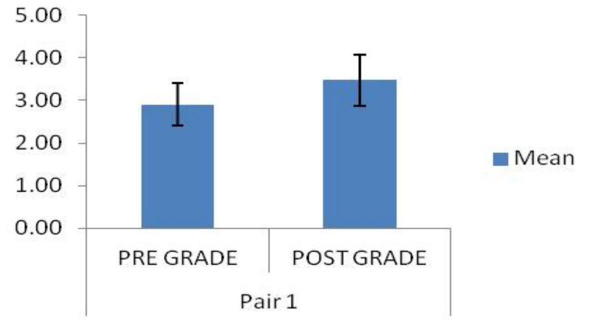

**Graph 2:** Comparison of mean standard deviation of pre and post intervention for FFD2.




**Graph3 :** Comparison of mean standard deviation of pre and post intervention for TTA




**Graph 4:** Comparison of mean standard deviation of pre and post intervention for GRADE.




## DISCUSSION

The result obtained through our result reveals that neural mobilization can significantly affect myofascial chain flexibility. In our study slump stretching is used for neural mobilization as an intervention and pre & post mobilization measurements are recorded. When comparing the values, showing pre and post mobilization FFD1, the mean FFD1 was found to be in lower values after mobilization thus showing that increased tension has improved flexibility thereby reducing the distance.

In case of FFD2, the cervical spine was kept bent which further increased the neural tension and improved flexibility, hence showing reduced values after mobilization. Interpretation of the finger floor distance was done using a grade system, which demonstrated increment in grades after mobilization, thereby showing improvement in the flexibility.

The statistic modifications of FFD1 & FFD2 presented in this study after neurodynamic self mobilization suggest that there is a conversely proportional relation between neural tension and posterior myofascial chain flexibility. The results are also consistent with the assertations of Butler who see neural mobilization as a therapeutic technique for the treatment of nervous system dysfunctions as well as dysfunctions in the tissues innervated by it [2].

The only variable which showed no significant difference was TTA, the mean has found to be static, pre & post mobilization, which shows that there was no significant change in angle. Thus through our result we can say that slump stretching has no significant effect on TTA.

**Future research:** This study could be done with more frequent interventions and in comparison with other conventional or new approaches.

**Limitation of study:** Single time intervention and no comparison with other technique are the limitations of the study.

## CONCLUSION

There were significant changes in all the variables post mobilization showing improved flexibility. Therefore neural mobilization is an important technique to effectively elongate myofascial structures.

**Clinical implication:** Neural mobilization is found to be effective in improving myofascial flexibility. So this technique should be used to optimize flexibility and activities of daily living.

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**Conflicts of interest:** None

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