



Effects of Fascial Distortion Model with and without Neck Isometrics in Patients with Cervical Spine Overload

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DOI: <https://doi.org/10.52845/mcrr/2023/06-12-2>

Abstract: Background: Pain of cervical spine is one of the most widely recognized musculoskeletal disorder and spinal overload is one of the significant causes. Continuous overload and over burdening brings about radiation of pain, muscular weakness and limited range of motion.

Objective: To find out the effects of fascial distortion model with and without neck isometrics in patients with cervical spine overload.

Methodology: Randomized clinical trial was conducted on forty four patients that were having cervical spine overload. Recruitment of the patients into study were done in Sanabil health services hospital from Feb 2023 to Sep 2023 by consecutive sampling technique. Patients having age in between 20 to 30 years, trigger band pain pattern, limited cervical Rom with no abnormal neurological findings were included and previous cervical spine injuries, spondylosis and scoliosis were excluded in the study. Data measuring tools that were used in the study were NPRS, NDI and goniometer. Treatment was given to 2 groups. One group got treatment of FDM with isometrics and other group got treatment of FDM without isometrics. Data analysis was done by SPSS version 21.

Results: Findings revealed that differences between two groups were statistically significant ($p < 0.05$) and also statistically significant difference were observed within group analysis ($p < 0.05$) with respect to pain score, NDI, and cervical range of motion.

Paired sample t-test was used to compare NPRS, NDI and cervical ROM within each treatment group. The mean difference in pre and post treatment of NPRS and NDI was 4.29 ± 0.91 and 9.18 ± 1.95 for FDM with isometrics group while 3.17 ± 1.05 and 5.67 ± 2.01 for FDM without isometrics group respectively.

Conclusion: The study concluded that both groups were successful in bring down pain and enhancing cervical range of motion but FDM with isometrics group got improved results interms of mentioned outcome measures on the basis of mean differences.

Key Words: Cervical pain, Neck, Isometric contraction, Therapy, Fascial Distortion Model.

INTRODUCTION

The spinal overload disorder refers to step by step wearing off the structural components of the spine due to loading surpassing their endurance strength in framework of diminished flexibility⁽¹⁾. Persistent over loading or overburdening results in radiation of pain and decreases the distance of adjoining vertebrae⁽²⁾. Neck pain is the 4th main reason of disability, with a yearly predominance rate surpassing 30%. Mostly acute neck pain episodes usually resolve with or without therapy, however almost half of the people will keep on encountering some level of pain or frequent events⁽³⁾. Treatment given to patients with neck pain incorporates a blend of various physiotherapy exercises and modalities⁽⁴⁾. In 1991, the fascial distortion model was established by Stephen Typaldos and is merely new to conventional medication. This model recommends that musculoskeletal ailments are the consequences of modification to the fascia⁽⁵⁾. The fascial distortion model (FDM) is a method that is quick, quantifiable and viable technique for treating patients with variation of damages. There are 6 diverse proposed facial distortion and diagnosis in this model which includes trigger band, herniated trigger point, Folding distortion, continuum distortion, tectonic fixation and cylinder distortion⁽⁶⁾.

This study has a strong potential to know whether FDM alone is helpful in relieving cervical spine pain or its combination with neck isometrics maybe more beneficial in decreasing neck pain and increasing the mobility of the neck.

Joshua Boucher, et.al. In 2021 conducted an investigation showing manual therapy informed by fascial distortion model for plantar heel pain. The design used was single arm perspective effectiveness study and location used was a primary health care clinic in Fort Gordan. Subjects were received two different approaches of FDM. Results were showing remarkable and supported enhancement on functional measures⁽⁷⁾.

Thomas Kincheloe, et al., in 2021 reported a case study showing recovery of functional immobility of patient getting nursing for longer period by Fascial distortion model. Subjected were presented that were taking long term nursing facilities in getting up to bed or to wheel chair as they were having so many upper and lower limb facial distortions, after getting the treatment of FDM the response was notable as the patients were getting back to moderate functional mobility⁽⁸⁾.

In 2021, Kim, Ji et al., directed a study in which effectiveness of FDM was checked on ROMs, force sense and maximal grip strength. In this study, among the six procedures of FDM, (TB) and cylindrical distortion were connected to lower arm to see the quick impact of maximal hold quality, force sense and ROMs. 22 patients have taken part in this. Test used was paired-t test for analysis purpose. After applying the treatment there are noteworthy contrasts that expand the forcing sense and ROMs but no notable difference occurred in maximal hold quality⁽⁹⁾.

MATERIAL AND METHOD

This study was a Randomized Clinical Trial and conducted in Sanabil Health Services Hospital. Data collection was done by using consecutive sampling technique. Sample size of forty-four (44) was measured by using G power Analysis software, Version (3.1.9.2) with 0.80 power of study, with 5% margin of error and 95% confidence interval. (26) Patients having age in between 20 to 30 years, trigger band pain pattern, limited cervical Rom with no abnormal neurological findings were included and previous cervical spine injuries, spondylosis and scoliosis were excluded in the study.

Numeric Pain Rating Scale (NPRS) was used for pain measurement. It was 11 point scale (0-10) measuring the pain intensity with HIGH test-retest reliability of $r = 0.96$ while 0.86 to 0.95 were the validity correlations.⁽³⁵⁾ Neck Disability Index (NDI) was used to check the neck disability

index.⁽³⁶⁾ Group A include 22 Subjects who received FDM with neck isometrics in sitting position. Group B include 22 Subjects who received FDM without neck isometrics in sitting position. Patients were randomly assigned to either group A or group B after enrolling in the study by using lottery method. The number of chits were equal to the overall sample size, with odd number going to group A and even number going to group B. Each patient was asked to select a chit from a box, following which they were assigned to either group A or group B. **Group A:** Subjects in Group A received FDM with neck isometrics in sitting position. Firstly, patient got FDM (the method used in this study was trigger band). The treatment applied along the lines of pain with thumb until feeling of tissue melts in painful joint was achieved.⁽²⁶⁾ After that Subjects were taught neck isometric exercises and these were done in flexion, extension, right side bending and left side bending. Subjects were educated to place their dominant hand in back of their head and after that push their head against their hand for 5 seconds and repeat it for 5 times. Then dominant hand were at front, left and right side of head and same maneuver of hold were performed.⁽¹³⁾ **Group B:** Subjects of group B received the techniques of Fascial distortion model in sitting position. Patient got FDM (the method used in this study was trigger band). The treatment applied along the lines of pain with thumb until feeling of tissue melts in painful joint was achieved.⁽²⁶⁾ Treatment was given to both groups for 4 weeks with 2 sessions per weeks for 30 minutes. The data analysis was done by using SPSS version 21.

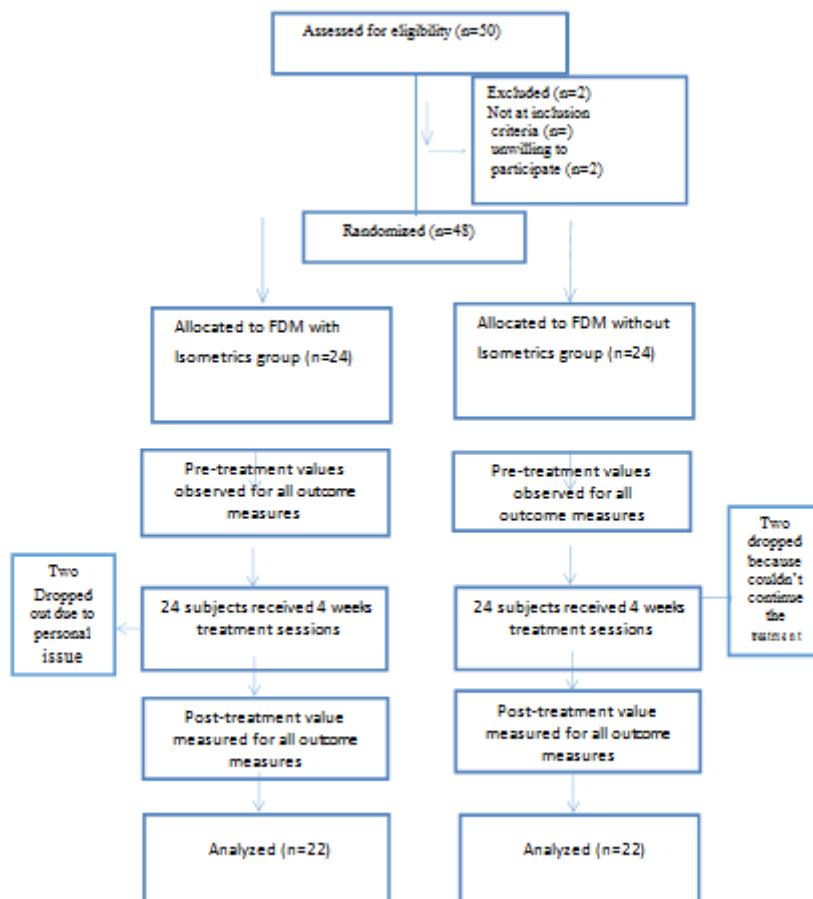


Figure # 1 CONSORT Flow diagram showing enrollment, allocation and progression of participants in study.

RESULT

Table # 1 Showing Comparison of Socio-Demographic Variables of two groups

Study Group	Group A Fascial distortion model with isometrics (n=22) (Mean ± SD)	Group B Fascial distortion model without Isometrics (n=22) (Mean ± SD)	P- value
Age of Participants(years)	26.62±2.33	26.29±2.82	0.658
Height in (m)	170.25±2.98	170.62±2.94	0.326
Weight in (kg)	72.66±8.22	74.73±5.99	0.663
Body Mass Index of Participants (kg/m ²)	24.95±2.56	25.67±1.81	0.266

Table # 2 Showing Base line measurement for Numeric pain rating scale, Neck disability index and Cervical Range of Motion

	Fascial distortion model with isometrics (n=22) Mean ± SD	Fascial distortion model without isometrics (n=22) Mean ± SD	P value
Numeric Pain Rating Scale	6.45±1.02	5.91±1.01	0.072
Neck Disability Index	17.00±2.04	15.3±2.03	0.054
Baseline Cervical Flexion	35.83±3.89	34.45±3.34	0.196
Baseline Cervical Extension	44.08±5.01	44.83±5.48	0.623
Baseline Cervical Right Side bending	27.08±3.37	27.91±3.96	0.437
Baseline Cervical Left Side bending	27.00±3.43	26.29±1.37	0.353
Baseline Cervical Right Rotation	57.83±4.18	58.58±3.88	0.522
Baseline Cervical Left Rotation	58.54±3.84	58.41±3.78	0.910

Table # 3 Showing between Group Comparison of NPRS and NDI

		Treatment Group		P value
		FDM with isometrics (n=22)	FDM without isometrics (n=22)	
NPRS	Pre-treatment (Mean±SD)	6.45±1.02	5.91±1.01	0.072
	Post-treatment (Mean±SD)	2.17±0.48	2.75±0.53	0.001
NDI	Pre-treatment (Mean±SD)	17.00±2.04	15.83±2.03	0.054
	Post-treatment (Mean±SD)	8.33±0.96	9.50±1.06	0.001

Note: NPRS = Numeric Pain Rating Scale, NDI = Neck Disability Index

Table # 4 Showing between Group Comparison of Cervical Flexion, Cervical Extension, Cervical Right Side Bending, Cervical Left Side Bending, Cervical Right Rotation and Cervical Left Rotation

		Treatment group		P value
		FDM with isometrics (n=22)	FDM without isometrics (n=22)	
Cervical Flexion	Pre-treatment (Mean±SD)	35.83±3.90	34.45±3.34	0.196
	Post-treatment (Mean±SD)	43.42±2.37	40.21±2.54	0.001
Cervical Extension	Pre-treatment (Mean±SD)	44.08±5.01	44.83±5.48	0.623
	Post-treatment (Mean±SD)	58.67±1.63	55.42±2.80	0.001
Cervical Right Side Bending	Pre-treatment (Mean±SD)	27.08±3.37	27.92±3.97	0.437
	Post-treatment (Mean±SD)	40.63±1.56	38.71±1.60	0.001
Cervical Left Side Bending	Pre-treatment (Mean±SD)	27.00±3.44	26.29±1.37	0.353
	Post-treatment (Mean±SD)	40.13±1.45	37.17±1.31	0.001
Cervical Right Rotation	Pre-treatment (Mean±SD)	57.83±4.18	58.58±3.88	0.522
	Post-treatment (Mean±SD)	68.79±1.79	66.21±2.78	0.001

Cervical Left Rotation	Pre-treatment (Mean±SD)	58.41±3.78	58.54±3.84	0.910
	Post-treatment (Mean±SD)	69.88±2.38	68.29±1.55	0.049

Table # 5 showing Comparison of NPRS and NDI across FDM with isometrics group and FDM without isometrics group

Study Group		Paired Difference		P value
		Mean	Std. Deviation	
FDM with isometrics (n=22)	NPRS_Pre	4.29	0.91	0.0001
	NPRS_Post			
FDM without isometrics (n=22)	NPRS_Pre	3.17	1.05	0.0001
	NPRS_Post			
FDM with isometrics (n=22)	NDI_Pre	9.18	1.95	0.0001
	NDI_Post			
FDM without isometrics (n=22)	NDI_Pre	5.67	2.01	0.0001
	NDI_Post			

DISCUSSION

In ongoing study, results were showing significant statistically difference between two groups having p value <0.05. Reduction of pain was significant having p value <0.05 but in FDM with isometrics group more changes were observed. This result was similar with a previous study by showed neck isometric exercises can reduce pain and cervical lordosis ⁽¹⁰⁾.

It was determined that FDM was powerful for relieving pain and providing improvement in ranges of motion. Similar results were found in a study led by Richter et.al showed that FDM was viable for discomfort and further help in diminishing pain by half ⁽¹¹⁾.

The research by Fink et.al, was conducted on 60 patients, additionally affirms that FDM treatment is helpful. Two groups were made and patients were divided equally. One group was given FDM treatment and other group was given manual therapy. Huge improvement was observed in both the groups, but the FDM group showing more fast impacts similar to the current study ⁽¹²⁾.

Another study done by M. Metzler, et al., about ankle sprain progressive rehabilitation. Nineteen patients were indulged in the study comprising of fourteen boys and five girls. All of them having ankle sprain grading 1 to 3. Treatment of Fascial distortion model was given to them. These results were similar to ongoing research as pain and ranges of motion were improved ⁽¹³⁾.

A further study came into agreement which showed statistically significant results to treat the pain and ranges of the neck alike the present study. The methods used were (MFR) myofascial release, (SMR) self-myofascial release

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and (FDM) fascial distortion model. The results showed that all the three techniques were positive in effectiveness in the pain reduction and range improvement of the neck same like the current study showed improvement in pain and ranges of cervical motion ⁽¹⁴⁾.

Our study reflected FDM with neck isometrics showed better results in decreasing pain is similar to the research conducted by Chhavi Singh in which he proposed that simply neck muscle isometrics exclusively can decrease pain and develop strength ⁽¹⁵⁾.

Consequences of current study showed that FDM with and without isometrics group have any statistically significant difference in post-treatment value of NPRS score and in between group analysis (p-value <0.05) and for both group analysis (p-value <0.05). The results of current study are consistent with RCT done to decrease pain by applying FDM and it supported the study results ⁽¹⁶⁾.

Unlike the current study which showed results of decreasing neck pain and improvement in range of motions by applying FDM, Bartochowski, et. al, led a case study in 2017 in which adverse effect of fascial distortion model was seen. Transient palsy of accessory nerve was occurred after applying treatment of FDM around the area of neck and shoulder to a 56 years old man ⁽¹⁷⁾.

CONCLUSION

The study concluded that both FDM with isometrics group and FDM without isometrics group were effective in reducing pain on Numeric Pain Rating Scale and improving Neck Disability Index and cervical range of motion but FDM with isometrics group got improved results in terms of mentioned outcome measures on the basis of mean difference

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