



# Effects of Relaxation Massage Bed Therapy in The Treatment Of Mechanical Neck Pain

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## ABSTRACT

**Background:** Mechanical neck pain is when there is no patho-anatomic cause behind it. In the recent times, usage of desktops & screen times has drastically risen. This is leading to increased, ihunch, forward head, hump neck, etc.

**Methodology:** Subjects were selected in group A & group B on random basis using chit system. Subjects were explained about their treatment & the advantages and adverse effects of the treatment if any. Consent was taken. Assessment was done prior & post treatment plan. Cranio-Vertebral Angle (CV angle) & Neck Disability Index (NDI) were used. Two Groups were made, Group A included 34 participants treated with conventional therapy- moist heat pack, stretching of trapezius & levator scapulae & strengthening of trapezius & levator scapulae. Group B was experimental group- Relaxation Massage Bed Therapy.

**Results:** The average change in CV angle in control group was  $-2.745 (\pm 2.989)$  and the average change in CV angle in experimental group was  $-1.406 (\pm 4.200)$ . The analysis of

independent sample t-test indicates no significant difference in the mean change in the CV angle ( $t=-1.499$ ,  $p=0.139$ ) The average change in neck disability index in control group was  $-17.497 (\pm 7.950)$  and the average change in neck disability index in experimental group was  $-22.537 (\pm 10.119)$ . The analysis of independent sample t-test indicates a significant difference in the mean change in the neck disability index. ( $t=-2.257$ ,  $p=0.027$ ).

**Conclusion:** With the above results, it can be seen that, there is a significant improvement in NDI in both experimental & control groups. CV angle has no significant improvement.

**KEY WORDS:** Relaxation massage bed, Dr.Daga bed, cranio-vertebral angle, neck disability index, neck pain, forward head posture.

## INTRODUCTION

Individuals with neck pain that lack an identifiable patho-anatomic cause for their symptoms are usually classified as having mechanical neck pain. Direct patho-anatomic cause of mechanical neck pain is rarely identifiable. Although the cause of neck pain may be associated with degenerative processes or pathology, the underlying muscle is most often unknown<sup>1</sup>. The potentially unique factors in the Indian population which could increase their risk to developing neck pain are classified as structural differences, lifestyle differences, metabolic differences<sup>2</sup>.

Structural differences such as a slightly lower bone density norm, the highest incidence of congenital abnormalities, and different sagittal canal dimensions of the cervical spine may increase the risk of developing early degenerative changes, which could possibly enhance the risk for the Indian population to developing neck pain.

Lifestyle differences, such as a rapid increase in smoking between the ages of 15 and 39 years, in the Indian population, could be associated with an increased risk to the development of neck pain. This could be due to smoking being a risk factor in the development of neck pain, through a process of hypoxia.

Further, metabolic differences, abdominal obesity, is higher in Indian adolescents when compared with White adolescent, and thus a risk factor of developing osteoarthritis. This may increase the risk of the Indian population developing neck pain in the long term.<sup>2</sup>

Simons had made the hypothesis that prolonged depolarization of post junctional membrane and contracture, short sarcomere is the result of increase Ach release. Thus, extremely constricted sarcomere of motor end plate is known as "contraction knot. Chronic sustained

sarcomere shortening can lead to increased local energy intake; decreased local circulation both of which give the combined effect of local ischemia and hypoxia. On observation histologically, upsurge tension of taut band results in combined effect of tension produced by severed contraction knots<sup>3</sup>.

Cervical musculoskeletal abnormalities have traditionally been linked to different headaches<sup>4,5</sup>. One frequently noted abnormal posture is an excessive forward head position, or forward head posture (FHP)<sup>6</sup>. FHP has already been related to cervicogenic headache<sup>7</sup> and we have recently found FHP in association with chronic tension-type headache (CTTH)<sup>8</sup>.

Forward head posture (FHP) is the anterior positioning of the cervical spine, this posture is called as “text neck”, “scholar’s neck”, “wearies neck”, “ihunch”, “reading neck”. It is a postural problem that is caused by several factors including sleeping with the head elevated too high, extended use of computers, laptops & cell phones, lack of developed back muscle strength and lack of nutrients such as calcium. Forward head posture afflicts a large chance of population and can beget significant neck pain, while in this posture; the cranium is carried anterior to the body’s centre of gravity there by informing a habitual condition that puts increased stress on the postural musculature of the entire spine especially cervical spine. Forward head posture is linked by identifying cranio-vertebral angle. Measurement of CV angle is from C7 spinous process to tragus of ear. Forward head posture is common in all age groups, mean age group in males is 22-44 years and normal CV angle in them is about 48.8 degrees, mean age group in females is 23-66 years and normal CV angle in them is about 47.6 degrees. Normal CV angle is 49.9 degrees<sup>9</sup>.

Relaxation Massage Beds are known for their beneficial effects commercially. They try & mimic human massage therapist techniques. They are more & more complex but also widely available for the population. In this study we are going to see the possibility of introducing massage beds in multidisciplinary programs for pain relief & recovery from neck disorders. They may be classified in the following ways:

1. Mechanically designed Relaxation massage beds
2. Water/ Hydro designed Relaxation massage beds

Although massage beds are used all over the world, they are generally used for relaxation. There are limited specialised studies that provide details about concrete ways of their use. These conclusions must be accepted only with caution, as they concern only this group of subjects & the study carried out in the specific conditions.<sup>10</sup>

The bed's internal projector moves along the spine from the cervical to the sacrum and

analyses the length and curves of the spine to perform a proper body massage. The internal projector descends from the cervical vertebrae and reaches the coccyx to stimulate the different points of application of the spine in each of us, namely the points of application located on the muscles that support the vertebrae. The use of this method of recovery and relaxation is closely related to exercise programs that have the role of stabilizing the alignment of the spine in terms of muscle & joint.

To maximise the effects of this massage bed, the individual must be physically active in order to incorporate during tractions efficiently<sup>10</sup>.

## Materials & Methodology

Ethical approval was taken from Institutional Ethical committee. Inclusion criteria, where each patient between the age of 20-40, of both genders, was diagnosed for mechanical neck pain by an orthopedic doctor was met and they were selected for the study. Subjects fulfilling mechanical neck pain were selected randomly. Subjects were selected in group A & group B on random basis using chit system. 66 chits were made (34 group A and 32 group B) and each chit was discarded after a pick. Subjected were explained about their treatment & the advantages and adverse effects of the treatment if any. Consent was taken in written using the form below. Assessment was done prior & post treatment plan. CV Angle: Patients consent was taken, to mark C7 with a tape. C7 was marked. An Image was taken laterally from the Right Side such that C7 & Tagus of ear was visible. Image was added to MB ruler to check CV angle accurately.

Neck Disability Index: It's a questionnaire that's been created to help us learn more about how neck pain has impacted your capacity to function in everyday life. The Neck Disability Index Questionnaire consist of 10 item including pain intensity, personal care, lifting, reading, headaches, concentration, work, driving, sleeping and recreation<sup>11</sup>.

Two groups were made as follows:

A – Control / Conventional Physiotherapy

6 Sessions of Moist Heat Fermentation for 10mins, Trapezius Stretching twice for 30 secs, Levator Scapulae Stretch twice for 30 secs, Chin Tuck-Ins twice for 10 reps, Shoulder Shrugs twice for 12 reps.

- Group B -

6 Sessions of Relaxation Massage Bed Therapy (Daga bed) for 15 minutes.

Along with Conventional Physiotherapy



For the Control Group A, the patients were taken in prone lying, with hands by the sides of their body to administer Fig 1: Approach used for Group A patient was taken into supported sitting to proceed with stretching & strengthening.

For the Experimental Group B, the patients were taken into supine lying directly onto the relaxation Massage Bed, manufactured by Dr. Daga.



Fig 2: Approach used for Group B

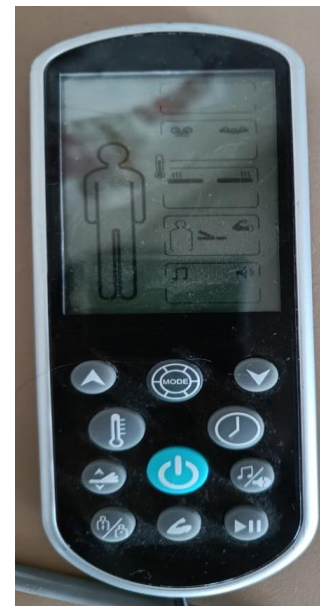


Fig 3: Relaxation Massage Bed by Dr. Daga with its operation remote control

## STATISTICAL ANALYSIS

For sample size calculation, using G Power software, Assumption sample size is total 66 Error if problem is 0.05 & Power is 80%. Total number of groups is 2. This analysis was done using Statistical test ANOVA.

## RESULTS

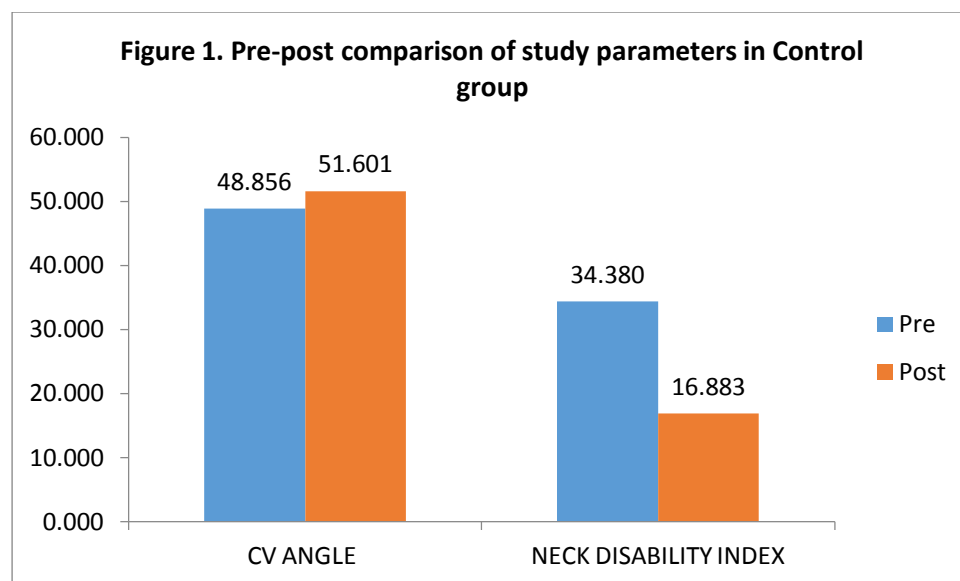
**Table 1. Pre-post comparison of study parameters in Control group**

	Mean	N	SD	SEM	t-stat	p-value
CV ANGLE Pre	48.856	34	2.487	0.427	-5.355	<.001**
CV ANGLE Post	51.601	34	2.063	0.354		
NECK DISABILITY INDEX Pre	34.380	34	15.386	2.639	12.833	<.001**
NECK DISABILITY INDEX Post	16.883	34	12.123	2.079		

Table 1 and figure 1 indicates pre-post comparison of CV angle and neck disability index in control group.

The mean pre-test CV angle was 48.856 ( $\pm 2.487$ ) and the mean post-test CV angle was 51.601 ( $\pm 2.063$ ). The paired t-test result indicates a significant increase in the CV angle ( $t = -5.355$ ,  $p < .001$ )

The mean pre-test neck disability index was 34.380 ( $\pm 15.386$ ) and the mean post-test neck disability index was 16.883 ( $\pm 12.123$ ). The paired t-test result indicates a significant decrease in the neck disability index ( $t= 12.833$ ,  $p<.001$ )



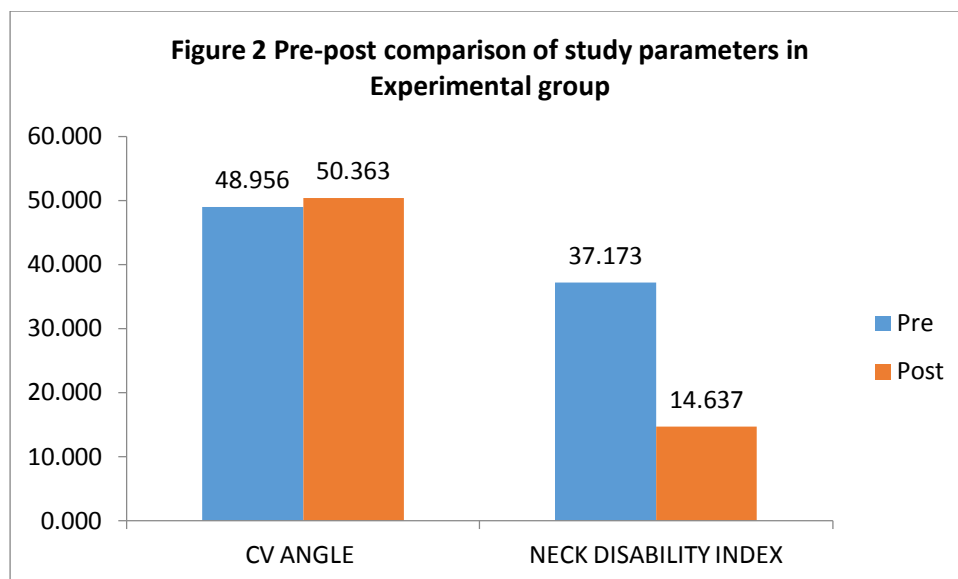
**Table 2. Pre-post comparison of study parameters in Experimental group**

	Mean	N	SD	SEM	t-stat	p-value
CV ANGLE Pre	48.956	32	2.906	0.514	-1.894	0.068, NS
CV ANGLE Post	50.363	32	4.453	0.787		
NECK DISABILITY INDEX Pre	37.173	32	14.586	2.579		<.001**
NECK DISABILITY INDEX Post	14.637	32	7.703	1.362		

Table 2 and figure 2 indicates pre-post comparison of CV angle and neck disability index in experimental group.

The mean pre-test CV angle was 48.956 ( $\pm 2.906$ ) and the mean post-test CV angle was 50.363 ( $\pm 4.453$ ). The paired t-test result indicates a no significant difference in the CV angle ( $t=-1.894$ ,  $p=0.068$ )

The mean pre-test neck disability index was 37.173 ( $\pm 14.586$ ) and the mean post-test neck disability index was 14.637 ( $\pm 7.703$ ). The paired t-test result indicates a significant decrease in the neck disability index ( $t= 12.599$ ,  $p<.001$ )

**Table 3. Between group comparison of Pre-post difference**

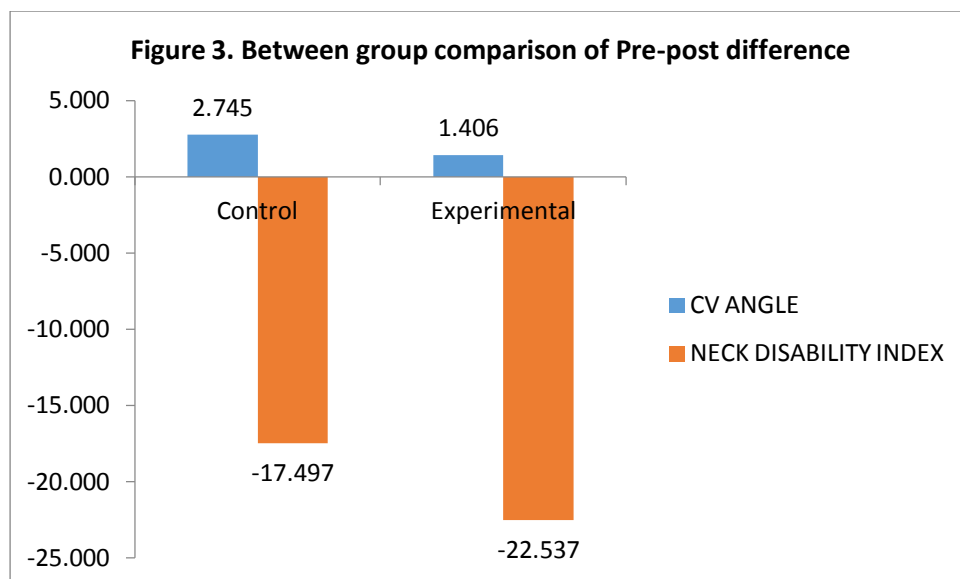
Group	N	Mean	SD	SEM	t-stat	p-value
CV Angle Change	Control	34	-2.745	2.989	-1.499	0.139
	Experimental	32	-1.406	4.200		
NDI Change	Control	34	17.497	7.950	-2.257	0.027
	Experimental	32	22.537	10.119		

Table 3 and figure 3 indicates between group comparison of difference in CV angle and neck disability index.

The average change in CV angle in control group was  $-2.745 (\pm 2.989)$  and the average change in CV angle in experimental group was  $-1.406 (\pm 4.200)$ . The analysis of independent sample t-test indicates no significant difference in the mean change in the CV angle ( $t = -1.499, p = 0.139$ )

The average change in neck disability index in control group was  $-17.497 (\pm 7.950)$  and the average change in neck disability index in experimental group was  $-22.537 (\pm 10.119)$ . The analysis of independent sample t-test indicates a significant difference in the mean change in the neck disability index. ( $t = -2.257, p = 0.027$ )





## DISCUSSIONS

Objective of the study was to understand the effects and clinical relevance of effects of Relaxation Massage Bed Therapy on patients with Mechanical Neck Pain in terms of Cranio-Vertebral Angle and Neck Disability Index on both males and females of age 20-40 years.

Two groups of patients diagnosed with mechanical neck pain diagnosed by an orthopedic doctor were formed on random basis. Groups were divided in two using random chit system. Assessment of NDI and CV angle was done twice, once before the start of the first session of rehabilitation and another assessment was taken after the end of the last treated session (6<sup>th</sup> session at the end of two weeks).

Group A was given Conventional Physiotherapy including moist heat pack, stretching and strengthening. Group B was given Relaxation Massage Bed Therapy (Daga Bed) along with conventional Physiotherapy. 6 sessions were given to each participant of each group. Sessions were taken on alternate days, 3 sessions per week. There were a total of 66 participants in two groups, out of which 25 were men & the remaining 41 were women.

Xavier and et. Al Women conducted study, are there gender differences in neck pain and musculoskeletal disorders of the cervical spine associated with migraine? Women showed higher prevalence of self-reported neck pain and increased risk of having this symptom in

comparison to men. However, men & women scored equally in neck pain-related disability. Women with migraine had a higher frequency of self-reported neck pain when compared to men. However, the two groups did not differ regarding neck pain-related disability<sup>12</sup>.

As observed in the results above, there was no significant improvement in Cranio Vertebral angle (CV angle) of the experimental group. However, the control group shows significant improvement on CV angle.

The control group had been doing supervised group & individual exercises. On the other hand, the experimental group was administered with relaxation massage bed therapy, often faced a time constrain. This led to them taking their exercise protocol at the comfort of their time. However, it was noticed that the experimental group did not focus enough on their physical exercises. This could have caused them to have a sub average efficiency of effects of the relaxation massage bed on CV angle.

Both the Neck Disability Index and Numeric Pain Rating Scale have shown to exhibited fair test-retest reliability, which was confirmed by Ian A. Young and et.al<sup>13</sup>.

Thavatchai Suvarnnato & et.al conducted a study on Effect of specific deep cervical muscle exercises on functional disability, pain intensity, cranio-vertebral angle, and neck-muscle strength in chronic mechanical neck pain, which suggests that a minimum of 6 weeks of conventional physiotherapy is required to observe any significant changes in CV angle<sup>14</sup>.

In both the control and experimental groups, there was a significant decrease in neck pain related disability which was measured by Neck Disability Index.

In the times of raging evolution, we as physiotherapists cannot be let down. In the recent times, there have been a significant development in the way patients can be dealt with. Shockwave therapy is one of the new developments. This device shows tremendous potential in the management of trapezius related neck pain. This gives us a good chance in the future to explore this the efficacy of effects of this modality in a similar population.

Dina Al-Amir Mohamed and et. Al, conducted a study, Combined effects of extracorporeal shockwave therapy and integrated neuromuscular inhibition on myofascial trigger points of upper trapezius: a randomized controlled trial. observed that Within-group analysis revealed a significant decline in visual analogue scale (VAS), Arabic neck disability index (ANDI), Multiple comparison analysis showed a substantial difference between the groups, while the major changes favoured group C<sup>15</sup>.

Ji-Kyun Joo, et.al suggested in their study, Effect of Ischemic Compression Therapy and Extracorporeal Shock Wave Therapy on the Trigger Point of the Upper Trapezius Muscle. that, both groups, Ischemic compression & shock wave therapy showed significant

differences before and after the intervention in Visual Analogue Scale (VAS) and Neck Disability Index (NDI) ( $p < .05$ ). In addition, there were significant differences in the Ischemic Compression group compared to the shockwave therapy group in VAS and NDI<sup>16</sup>. As a scope of the future, duration of the study can be extended to study the effects on CV Angle. There are even various modes of the Relaxation Massage Bed that have to be explored in the upcoming studies.

## Conclusion

In addition to, NDI results of the experimental group decreasing significantly, there has been a positive feedback about daga bed in context to relaxation and pain relief from patients in the experimental group. By this, we can see that Relaxation Massage Bed Therapy has a potential to be clinically relevant to patients' betterment in various conditions.

## Limitations

- Duration of the study is inadequate to show significant results on CV angle.

## Conflict of Interest

There is no conflict of Interest

## Funding

There was no funding provided.

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