



## TO COMPARE THE EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY VERSUS DIALECTICAL BEHAVIORAL THERAPY ALONG WITH BRUNKOW EXERCISES IN CHRONIC LOW BACK PAIN PATIENTS

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### ABSTRACT:

**Background:** Low Back Pain (LBP) is a major medical, social and economic problem in both developed and developing countries. It often affects all life domains & eventually has a profound impact on quality of life. Each year, 15–45% of adults suffer LBP and 1/20 people present to hospital with a new episode.

**Aim of the study:** The aim of the study is to find out the effectiveness of Cognitive Behavioral Therapy Vs Dialectical Behavioral Therapy along with Brunkow exercises & along with conventional therapy (Traction) to reduce pain and improve the quality of life by using VAS scale and Quality of life Questionnaire in Chronic Low Back patients.

**Objectives of the study:** To evaluate the effectiveness between Cognitive-Behavioral Therapy, Brunkow Exercises and Dialectical Behavioral Therapy, Brunkow Exercises along with Conventional therapy (Traction) for pain by using VAS and for Quality of life by using QOL Questionnaire on subjects with CLBP.

**Methodology:** 32 subjects who were clinically diagnosed of low back pain were assessed and 32 were recruited who are willing to be in the study and they were randomly allocated into 2 groups i.e Group A (n=16), Group B (n=16) . The outcome of this intervention was on Pain and Quality of life. This was recorded before and after the session of intervention.

**Results:** Statistical analysis of the data reveal that between the group comparison showed there is statistical significant difference in Visual Analogue Scale & Quality of life Questionnaire. Significant reductions ( $P < 0.01$ ) in participants' pain intensity, pain-related scores were found at the post treatment (vs pretreatment) assessment.

**Conclusion:** The Findings of the present study showed that both CBT & DBT along with Brunkow exercises were effective in reducing the intensity of Chronic Low Back Pain & improving the QOL but DBT were more effective when compared to CBT in reducing Pain and improving QOL.

### KEYWORDS:

COGNITIVE BEHAVIORAL THERAPY, DIALECTICAL BEHAVIORAL THERAPY, BRUNKOW EXERCISE, TRACTION, CHRONIC LOW BACK PAIN.

### INTRODUCTION

Low back pain is the leading cause of the disability worldwide, is associated with significant personal, social & economic burden.<sup>1</sup> a common disorder involving the muscles, nerves and bones of the back in between the lower edge of the ribs and the lower fold of the buttocks.<sup>2</sup> Chronic Low Back Pain is a common problem in primary care. Non-specific low back pain, back pain associated with radiculopathy or spinal stenosis, back pain referred from non spinal source or back pain associated with another specific spinal cause.<sup>3</sup> Low back pain is one of the most common reasons for an individual to be referred to a physician with substantial health care cost for the individual and national treatment costs each year.<sup>4</sup>

The first year incidence of first ever low back pain has been estimated to be b/w 6.3 and 15.4%.<sup>5</sup> It's 5-10% of all

LBP patients will develop chronic low back pain. It's prevalence rates are lower in individuals aged 20 to 30 years, increasing from third decade of life and reaching highest prevalence rates stabilizing 7th decade of life. Back pain is widespread in the adult population. Some studies have shown that up to 23% of the world's adults suffer from Chronic low back pain. This population has also shown a one-year recurrence rate of 24% to 80% .<sup>6</sup>

Low Back Pain is the fifth most common reason for physician visits, which affects nearly 60-80% of people throughout their lifetime. The lifetime prevalence of low back pain is reported to be as high as 84% and the prevalence of chronic low back pain is about 23% with 11-12% of the population being disabled by low back pain. In 2010 Global Burden of Disease study the global age-standardized point prevalence of LBP was estimated to be 9.4%. Some estimates of lifetime prevalence are as high as 84% in the adult population.<sup>7</sup>

One study demonstrated that the point prevalence of back pain was approximately 1% for 12-year-olds and 5% for 15-year-olds, with a cumulative incidence of 50% by age 18 for females and age 20 for males.<sup>8</sup> Acute low back pain is an episode of low back pain for less than 6 weeks, sub acute low back pain between 6 and 12 weeks and chronic low back pain for 12 weeks or more.<sup>9</sup> The Clinical Features of Chronic Low Back Pain includes features like Localized back pain, Muscular spasms, Difficulty in walking, in getting up.<sup>10</sup> Physical work is unstable without the support of the muscles that power the trunk and position the spinal segments.<sup>11</sup>

The loss of disk structure also alters the loading response and alignment of the rest of the spinal column, including that of the facet joints, ligaments and Para spinal muscles which eventually may become additional pain generators.<sup>12</sup> Several cytokines have been identified that may be responsible for chemical mediation of pain. Similarly, endogenous inhibitors of these cytokines have been isolated.<sup>13</sup> The Diagnostic criteria for low back pain are X-rays shows alignment bones and arthritis or broken bones, MRI or CT scans. Blood tests, Bone scan, Nerve studies- Electromyograph.<sup>14</sup> The Medications are given depending on the type of back pain Over-the-counter pain relievers. Nonsteroidal anti-inflammatory drugs, Topical pain relievers, ointments or patches. Narcotics, antidepressants.<sup>15</sup>

Low Back Pain that has been present for longer than three months is considered chronic, although there is still no consensus about the definition of CLBP. CLBP has been associated with neurochemical, structural, and functional cortical patients a specific generator cannot be identified with certainty. It is estimated that seven million adults changes of several brain regions includes somatosensory cortex.<sup>16</sup>

Cognitive behavioural therapy (CBT) is believed to improve chronic pain problems by catastrophing and increasing patient self efficacy for managing pain.<sup>17</sup> CBT is typically conceptualized as a short term skills focused treatment aimed at altering maladaptive emotional responses by changing the patient's thoughts behaviours or both.<sup>18</sup> The amalgam of behavioural and cognitive interventions guided by principles of applied science the behavioural interventions aim to decrease maladaptive behaviours or increase adaptive ones by modifying their antecedents and consequences and by behavioural practices that result in new learning.<sup>19</sup> The cognitive interventions aimed to modify maladaptive cognitions, self statements or beliefs. The hallmark features of CBT are problem focused to intervention strategies that are derived from learning theory as well as cognitive theory principles.<sup>20</sup>

Linehan, an American psychologist and author, the creator of DBT, a type of psychotherapy that combines behavioural science with concepts like acceptance and mindfulness. These two concepts are the foundation of her therapy, DBT. The term –DIALECTICAL means interaction of conflicting ideas within dialectical behavioural therapy.

Dialectical refers to the integration of both acceptance and change as necessity for improvement.<sup>21</sup> Dialectical behavioural therapy aims to address the symptoms of Borderline personality disorder by replacing maladaptive behaviours with healthier coping skills such as mindfulness, interpersonal effectiveness, emotional regulation and distress tolerance.<sup>22</sup> Dialectical Behavioural Therapy is multicomponent cognitive behavioural treatment that targets treatment engagement & reduction of self harm and suicide attempts and focuses on teaching skills for enhancing emotional regulation distress tolerance and building a life worth living.<sup>23</sup> DBT is a form of manualized psychotherapy aiming to treat patients with chronic suicidality and complex clinical need. DBT is shown to reduce the frequency of self harm among patients with a past history of repeated self injury and personality disorders and improve treatment adherence.<sup>24</sup>

Dialectical Behavioural Therapy is based on cognitive behavioural therapy combined with the dialectical thinking of Eastern Zen and is based on the principles of dialectics in which the dialectical relationship between normal and abnormal psychology and behavior as well as the dialectical balance of acceptance & changes is emphasized.<sup>25</sup> DBT can help people use mindful mindfulness skills in daily life to master psychological functions recognize the self adjust disordered emotions, establish effective interpersonal relationships and learn how to endure the inevitable pain of life and others.<sup>26</sup> Traction is the most effective form of treatment in cases where back pain has been caused by pinching or compressing of nerve. Lumbar traction functions to significantly limit the activity of the patient.<sup>27</sup>

The exercise program for low back pain includes a warm-up session of five exercises well-known exercises targeting the muscles of the back extensors, abdominals, lateral buttocks, trunk rotators, posterior buttocks, leg muscles, and oblique abdominals as well as exercises for flexibility for each of the eight types of exercise. After each type of exercise, the patient should records the level of each exercise for each training session during the eight-week period.<sup>28</sup>

Brunkow Exercises (BE)-Pushing exercises, can do in all starting positions. Dynamic contraction from the beginning, transferring through kinetic chain leads to isometric contraction of the group of muscles which has to be included in the exercise. Starting positions determinates the group of muscles to be trained.<sup>29</sup> Exercises for lower back pain can strengthen back, stomach, and leg muscles.

### NEED OF THE STUDY

Chronic Low Back Pain is a common disease that upto 84% of adults will experience during their lives, upto 50% of them will have more than one episode. Chronic low back pain is associated with significant economic burden including hospitalization. There is a lack in the literature about correlation of CBT and DBT along with Brunkow Exercises and Traction in Chronic Low Back Pain Patients.

## AIM OF THE STUDY

The aim of the study was to find out the effectiveness of Cognitive Behavioural Therapy Vs Dialectical Behavioural Therapy along with Brunkow exercises & along with conventional therapy (Traction) to reduce pain and improve the quality of life by using VAS scale and Quality of life Questionnaire in Chronic Low Back patients.

## OBJECTIVES OF THE STUDY

- To find out the effect of Cognitive Behavioural Therapy along with Brunkow exercises along with conventional therapy (Traction) to reduce pain by using VAS scale in subjects with Chronic Low Back Pain.
- To find out the effect of Dialectical Behavioural Therapy along with Brunkow exercises along with conventional therapy (Traction) to reduce pain by using VAS scale in subjects with Chronic Low Back Pain.
- To find out the effect of Cognitive Behavioural Therapy along with Brunkow exercises along with Conventional therapy (Traction) to improve the Quality of life by using QOL Questionnaire in subjects with Chronic Low Back Pain.
- To find out the effect of Dialectical Behavioural Therapy along with Brunkow exercises along with Conventional therapy (Traction) to improve the Quality of life by using QOL Questionnaire in subjects with Chronic Low Back Pain.

## MATERIALS AND METHODOLOGY

### MATERIALS USED: VAS scale

QOL Questionnaire  
Paper & pen  
Chair  
Stop watch  
Traction unit  
High couch

## METHODOLOGY

**STUDY SETUP:** The study was performed in the department of physiotherapy in GH & also in Apollo College of physiotherapy, Chittoor, AP.

**STUDY DESIGN:** Experimental design

**SAMPLING METHOD:** Purposive sampling

**STUDY DURATION:** 4 weeks

**SAMPLE SIZE:** 32 subjects

### INCLUSION CRITERIA:

- Age limit with 25-35 years
- Both genders are included
- Subjects willing to participate voluntarily
- CLBP more than 12 weeks
- Anxiety, Depression, Pain

### EXCLUSION CRITERIA:

- Unstable vital signs
- Pregnancy
- Malignancy
- Previous surgeries
- Trauma
- Infections
- Specified, Unspecified
- Respiratory diseases
- Neurological related to the back.
- Osteoporosis

## OUTCOME MEASURES

- Visual Analogue Scale – To measure severity of pain
- Quality of life Questionnaire – To assess the quality of life

## INTERVENTION

### COGNITIVE BEHAVIOURAL THERAPY

The goal of therapy is to identify the maladaptive cognitive process and to learn new ways of perceiving and thinking about events. These new ways of thinking will lead to more positive behavioural and emotional responses. CBT is a well-organized, short term goal oriented therapy which focuses on the identification of an individual's unusual ways of thinking or pathological conditions which result in unethical behavioural ways. CBT seeks to give patients the ability to recognize when their thoughts might become troublesome, and gives them techniques to redirect those thoughts. DBT helps patients find ways to accept themselves, feel safe, and manage their emotions to help regulate potentially destructive behaviours. Patients with CLBP may experience anxiety associated with activities that may cause them to experience or exacerbate their pain. The goal of these techniques is to reduce the anxiety that is associated with the pain experience, and help the patient to ease their tension, thereby decreasing some of the pain symptoms experienced.

**BRUNKOW EXERCISES** can be done in all starting positions. They are starting with dynamic contraction of hands and feet with fixed point on the wrist or/and heel. Dynamic contraction from the beginning, transferring through kinetic chain leads to isometric contraction of the group of muscles, which has to be included in the exercise. Starting positions determinates the group of muscles to be trained. Brunkow – Plank from a sitting position, into a position of "high" tilted sitting position.

**LUMBAR TRACTION-** Traction is defined as the act of exerting a pulling force. Lumbar traction can be used in either a prone or a supine position. The therapist positions the patient so that hip and knees are flexed to 90° while the patient is supine. This position reduces lumbar lordosis. The goal of traction is to unload the disc space and muscles in the lumbar spine. This unloading is thought to provide a recuperative period which allows the muscles to rest and takes pressure off the disc space. Traction can help in relieve pressure on spinal nerves and relieve pain due to it.

**DIALECTICAL BEHAVIOURAL THERAPY-** Its main goals are to teach people how to live in the moment, develop healthy ways to cope with stress, regulate their emotions, and improve their relationships with others. DBT focuses on helping people accept the reality of their lives and their behaviours, as well as helping them learn to change their lives including their unhelpful behaviours. DBT is an evidence-based method of psychotherapy and a specific form of CBT, mainly targets on an individual's emotional and social aspects that focuses on helping people who tend to have extreme emotional reactions interact with the environment around them in a less emotional, healthier way. DBT relies heavily on mindfulness skills used in Buddhism and Zen practices. DBT helps people to identify their capabilities and drawbacks in life, thereby enhancing their capacity to regulate emotions and cope up with the challenges faced in day to day life. Mindfulness means maintaining a moment-by-moment awareness of our thoughts, feelings, bodily sensations, and surrounding environment, through a gentle, nurturing lens. Distress tolerance is a person's ability to manage actual or perceived emotional distress. It also involves being able to

make it through an emotional incident without making it worse. Interpersonal effectiveness refers to the ability to interact with others. Emotional intelligence, Communication, Positivity.

**STATISTICAL ANALYSIS & RESULTS**

**STATISTICAL ANALYSIS:**

Statistical analysis was performed using MS Excel 2007 and GRAPHPAD software version 20.0. Descriptive statistical data has presented in the form of mean standard deviation and mean difference percentage were calculated and presented.

Between the groups: Unpaired t'test was performed to assess the statistical significant difference in mean values between the groups for VAS and QOL Questionnaire for pre and post Test values.

Within the groups: Paired t'test was performed to assess the statistical difference within the groups for VAS and QOL Questionnaire for pre and post Test values.

The statistical significance was set at  $p < 0.05$  with 95% confidence intervals.

	PRE TEST VALUE		POST TEST VALUE		DF	t-Value	P-Value
	MEAN	MEAN+SD	MEAN	MEAN+SD			
VAS (GROUP A)	7.93	7.93+1.43	2.5	2.5+ 1.032	15	24.3	<0.05
QOL (GROUP A)	3.06	3.06+1.23	7.18	7.18+1.37	15	11.3	<0.05
VAS (GROUP-B)	8.06	8.06+1.06	3.5	3.5+1.36	15	18.6	<0.05
QOL (GROUP-B)	3.43	3.43+1.26	8.25	8.25+1.23	15	23.07	<0.05

**RESULTS**

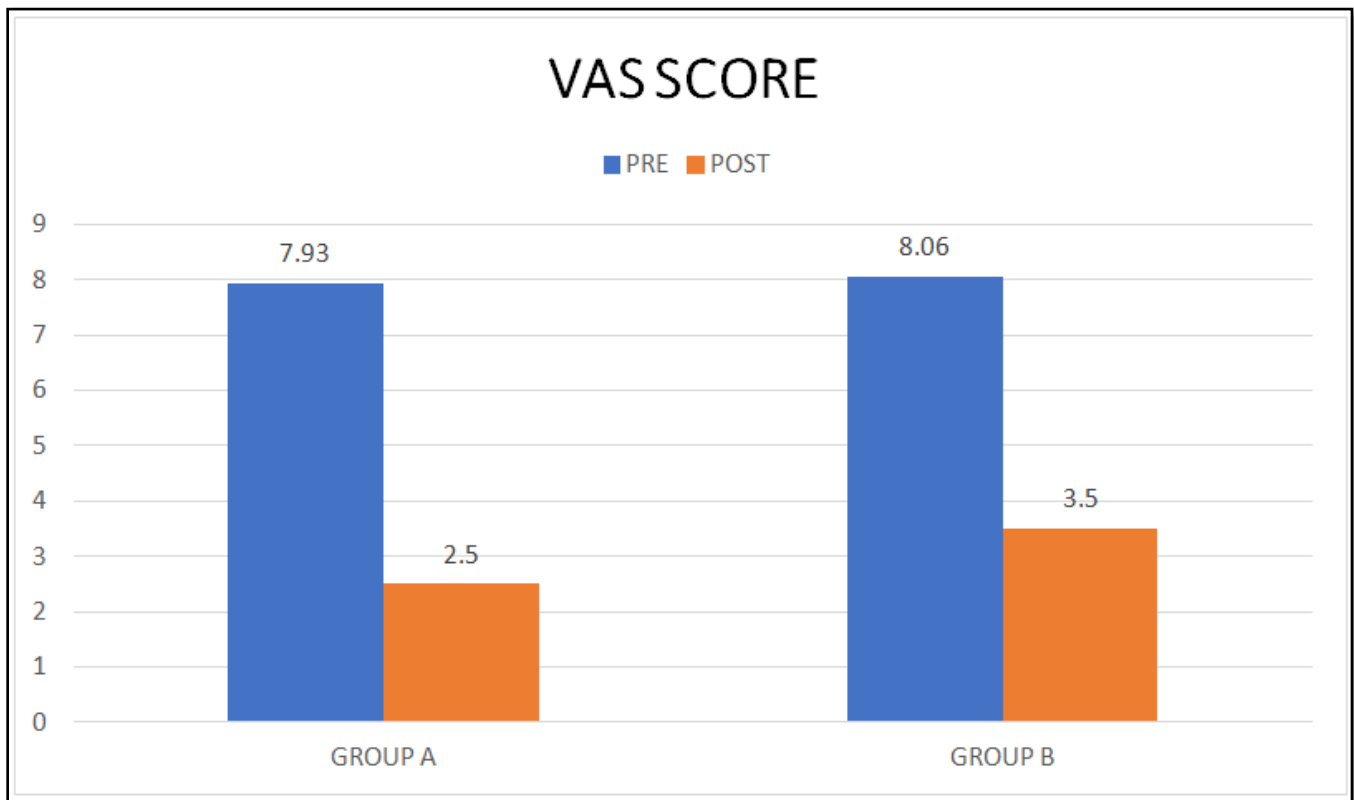
The results of this study were analyzed which was based on Pain and Quality of life measured by Visual Analogue Scale and Quality of life Questionnaire.

The result shows that the Pre & Post Mean value of VAS is <0.0001 and QOL Questionnaires is <0.0001, the outcome

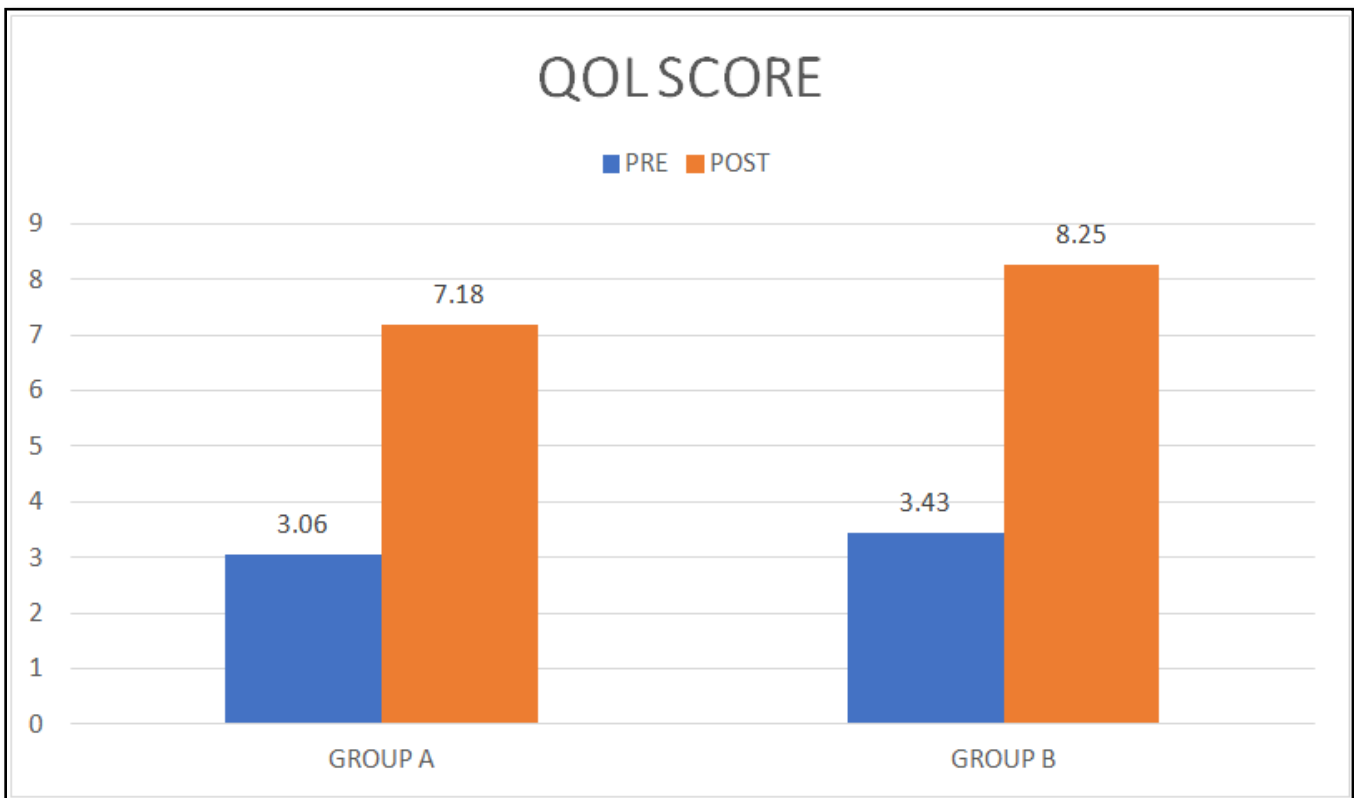
measures are significant in Group-A (CBT, Brunkow Exercises & Traction).

The results shows that the Pre & Post Mean values of VAS is <0.0001 and QOL Questionnaire is <0.0001 the outcome measures are significant in Group-B (DBT, Brunkow Exercises & Traction).

After analysis of data, Group-B showed significant result than that of Group-A. Therefore, the study was rejecting Null hypothesis and accepting Experimental hypothesis.



**RESULT: TABLE-1 SHOWS THE MEAN VALUES OF PRE AND POST VALUES OF VISUAL ANALOGUE SCALE (VAS) IN GROUP A & B**



**RESULT: TABLE-2 SHOWS THE MEAN VALUES OF PRE AND POST VALUES OF QUALITY OF LIFE (QOL) IN GROUP A & B**

## DISCUSSION

The aim of the present study is to find out the effectiveness of Cognitive behavioural therapy Vs Dialectical Behavioural Therapy along with Brunkow Exercises in Chronic Low Back Pain patients. Group-A with 16 CLBP individuals underwent training of CBT, Brunkow exercises & Traction and Group-B with 16 individuals underwent training of DBT, Brunkow exercises & Traction for 3 months.

### PRE AND POST INTERVENTION MEAN VALUES OF VAS, QOL OF GROUP A

In the present study it has been reported that chronic low back pain individuals in group A with CBT, Brunkow exercises & Traction showed mean value of VAS from  $7.937 \pm 1.43$  to  $2.5 \pm 1.032$ , mean value of QOL from  $3.06 \pm 1.23$  to  $7.187 \pm 1.37$ , the values are significant. The study suggested that the aim of CBT was to help patients adapt and make desirable changes in the present rather than to deal with issues in the distant past. The goal for long-lasting successful outcomes is for the patient to develop an internal locus of control. CBT can reduce levels of pain and pain-related disability, improve physical and social functioning, as CBT for CLBP Patients.

The study investigated use of Brunkow exercises in the treatment of patients suffering from low back pain and its influence on pain relief, spinal movements and flexibility of spine. Brunkow exercises, as isometric exercises for paravertebral muscles have mainly goal to tone the muscles, we were interesting to their influence on spinal movements, flexibility of spine and pain relief.

All patients were assessed before and after the treatment and their spinal movements, spinal flexibility and intensity of pain are measured.

### PRE AND POST INTERVENTION MEAN VALUES OF VAS, QOL OF GROUP B

In the present study it has been reported that chronic low back pain individuals in group B with DBT, Brunkow exercises & Traction showed mean value of VAS from  $8.06 \pm 1.06$  to  $3.5 \pm 1.36$ , mean value of QOL from  $3.43 \pm 1.26$  to  $8.25 \pm 1.23$ , the values are significant. Pain intensity ratings dropped at the end of treatment. All the study showed small differences in effects between traction and other treatment options on pain intensity, functional status, global improvement and return to work at short term.

A clinically relevant effect was achieved in pain intensity at three to five weeks' follow-up in people undergoing traction, the level of physical force applied in the treatment and concluded that even a low level of force may be effective. Pain was the most impairing symptom in this patients' sample and each patient experienced pain before

treatment. After treatment a significant pain reduction

occurred.

Comparing pre-treatment and post-treatment results. All patients showed some evidence of restricted ROM before the treatment, mostly because of pain limitation. The results had shown that both Cognitive behavioural therapy, Brunkow Exercises & Traction and Dialectical behavioural therapy, Brunkow Exercises & Traction who received the four weeks of therapy has improved significantly on pre and post-test values within the groups and when compared between these groups there is statistical significance noted. So, this study concluded that there is significant difference between Cognitive behavioural therapy Brunkow Exercises & Traction and Dialectical behavioural therapy, Brunkow Exercise & Traction in improving quality of life and reducing pain among chronic low back pain patients.

## LIMITATIONS & RECOMMENDATIONS

### LIMITATIONS:

- The study did not include long term follow up.
- This study sample size was relatively small to detect the differences between Cognitive behavioural therapy, Brunkow exercises & Traction and Dialectical behavioural therapy, Brunkow exercises & Traction groups.

### RECOMMENDATIONS:

- Follow up programs can be included to assess the short term and long term effects of treatment.
- Further study can be done to check the effects of these techniques on other conditions.
- Effects of these trainings on other stages can be studied.
- Further study should include more measurement tools.

## CONCLUSION

This study conclude that in patients with Chronic low back pain both Cognitive behavioural Therapy and Dialectical behavioural therapy along with Brunkow exercises were effective in reducing the intensity of Chronic low back pain & improved the quality of life when compared to both treatments, Dialectical behavioural therapy were more effective when compared to Cognitive behavioural therapy in reducing the pain & improving the quality of life.

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