

## The Effectiveness Of Kinesiotaping Therapy And Dry Needling On Patients With Acute Bell's Palsy: A Randomized Controlled Trial

**Reda Aslam Ch** (Corresponding Author)

Master in Musculoskeletal Physiotherapy, Physiotherapist in Tertiary Care Hospital

Nishtar II Multan

Email: redachaudhry95@gmail.com

**Fizza Alam Awan**

Master in Musculoskeletal Physiotherapy, Physiotherapist in Multan

Email: azzif2azzif@gmail.com

**Dr. Fatima Ijaz**

Department of Physical Therapy, Times Institute, Multan, Pakistan

**Abdul Mughees Ali**

Department of physiotherapy (University of Health Sciences

### Author Details

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Corresponding E-mail & Author\*:

**Reda Aslam Ch**

Master in Musculoskeletal Physiotherapy, Physiotherapist in Tertiary Care Hospital Nishtar II Multan

Email:

redachaudhry95@gmail.com

### Abstract

Bell's Palsy is an acute idiopathic facial paralysis that leads to substantial functional impairment and emotional distress. Although corticosteroids and antiviral drugs remain the standard treatment, their effectiveness remains debatable. This randomized controlled trial compared the efficacy of kinesiotaping therapy versus dry needling for restoring facial function in acute Bell's Palsy. The study was conducted at the Physiotherapy outpatient departments of Bahawal Victoria Hospital and Civil Hospital, Bahawalpur, Pakistan. Sixty participants aged 30–59 years with confirmed acute Bell's Palsy were randomly assigned to two groups. Group 1 (n=28) received kinesiotaping therapy, while Group 2 (n=30) received dry needling; both interventions were administered three times weekly for six weeks alongside standard antiviral medication. Outcomes were assessed at baseline, third week, and sixth week using the Sunnybrook Facial Grading System and the House-Brackmann Facial Nerve Grading Scale. Non-parametric tests (Mann-Whitney U and Wilcoxon signed-rank) were applied using SPSS version 27. Both groups exhibited significant within-group improvements ( $p < 0.05$ ). However, the dry needling group demonstrated substantially greater improvements at both the third week (Sunnybrook:  $p = 0.002$ ; House-Brackmann:  $p = 0.013$ ) and the sixth week (Sunnybrook:  $p = 0.001$ ; House-Brackmann:  $p = 0.002$ ). Dry needling yields superior outcomes for facial symmetry and functional recovery in acute Bell's Palsy compared to kinesiotaping therapy.

## **Introduction**

Bell's palsy is a facial nerve disorder resulting in unilateral facial paralysis, affecting 15 to 30 individuals per 100,000 annually [1]. Typically, muscles on one side of the face are affected in this common idiopathic peripheral lower motor neuron palsy. Since the condition causes facial nerve dysfunction, it impacts patients physically, socially, and psychologically. According to most research, Bell's palsy resolves spontaneously within three weeks, with the majority of patients recovering during this period [2].

Due to the nature of the condition, facial nerve paralysis immediately affects facial appearance. Consequently, approximately 32.7% and 31.3% of patients respectively exhibit signs of anxiety, tension, and depression due to changes in their facial features, including difficulty closing the eyes and eating, along with associated psychological stress. Furthermore, 15% to 31% of patients with peripheral facial nerve palsy experience hearing loss, joint stiffness, contractures, and crocodile tears syndrome. Sequelae typically appear three to six months following symptom onset [3]. Kinesiology taping (KT) is a noninvasive and potentially beneficial approach for addressing facial muscle asymmetry and weakness in Bell's palsy. The goal of applying KT to facial muscles is to strengthen and restore paralyzed muscles, thereby enhancing necessary structural movement and preventing further dysfunction of affected muscles [4].

Dry needling, also referred to as trigger point dry needling, acupuncture, or intramuscular stimulation, is a therapeutic technique employed by various medical professionals, including chiropractors, physicians, and physical therapists. Thin, sterile needles are inserted into myofascial trigger points, which are hyperirritable areas within muscles that may cause pain or dysfunction. Dry needling is believed to interrupt the pain cycle by suppressing hyperactive motor neurons [5].

This study aimed to compare the effectiveness of kinesiotaping therapy versus dry needling for improving facial function in patients with acute Bell's Palsy.

## **MATERIALS AND METHODS**

### **Study Design and Setting**

A randomized controlled trial was conducted at the Physiotherapy outpatient departments of Bahawal Victoria Hospital and Civil Hospital, Bahawalpur, Pakistan, over a period of four months. A total of 60 participants aged 30 to 59 years with diagnosed acute Bell's palsy were enrolled. Sample size was calculated using Rao Soft online calculator.

Inclusion criteria followed Patients with Lower motor neuron facial nerve palsy, Confirmed diagnosis of Bell's palsy, Both male and female patients with age between 30 and 59 years. While patients with Neurodegenerative disorders, Autoimmune diseases and Lyme disease were excluded from the study.

The study adhered to the ethical committee guidelines of TIMES Institute, Multan. Participants provided written informed consent, were assured of confidentiality and anonymity, and were informed of their right to withdraw from the study at any time. All data were securely stored with password-protected access.

### **Sampling and Randomization**

Simple random sampling was employed. Participants were divided into two groups using concealed envelopes. Group 1 (n=28) received kinesiotaping therapy, while Group 2 (n=30) received dry needling. Different physiotherapists were assigned to each group to ensure blinding.

Intervention Protocol was as follow.

**Group 1 (Kinesiotaping):** Participants received kinesiotaping therapy three sessions per week for six weeks.

**Group 2 (Dry Needling):** Participants received dry needling three sessions per week for six weeks.

Both groups continued standard antiviral medication throughout the study period.

### Outcome Measures

**Sunnybrook Facial Grading System:** This instrument evaluates facial function through three components: resting symmetry, voluntary movement, and synkinesis. Higher scores indicate better facial function.

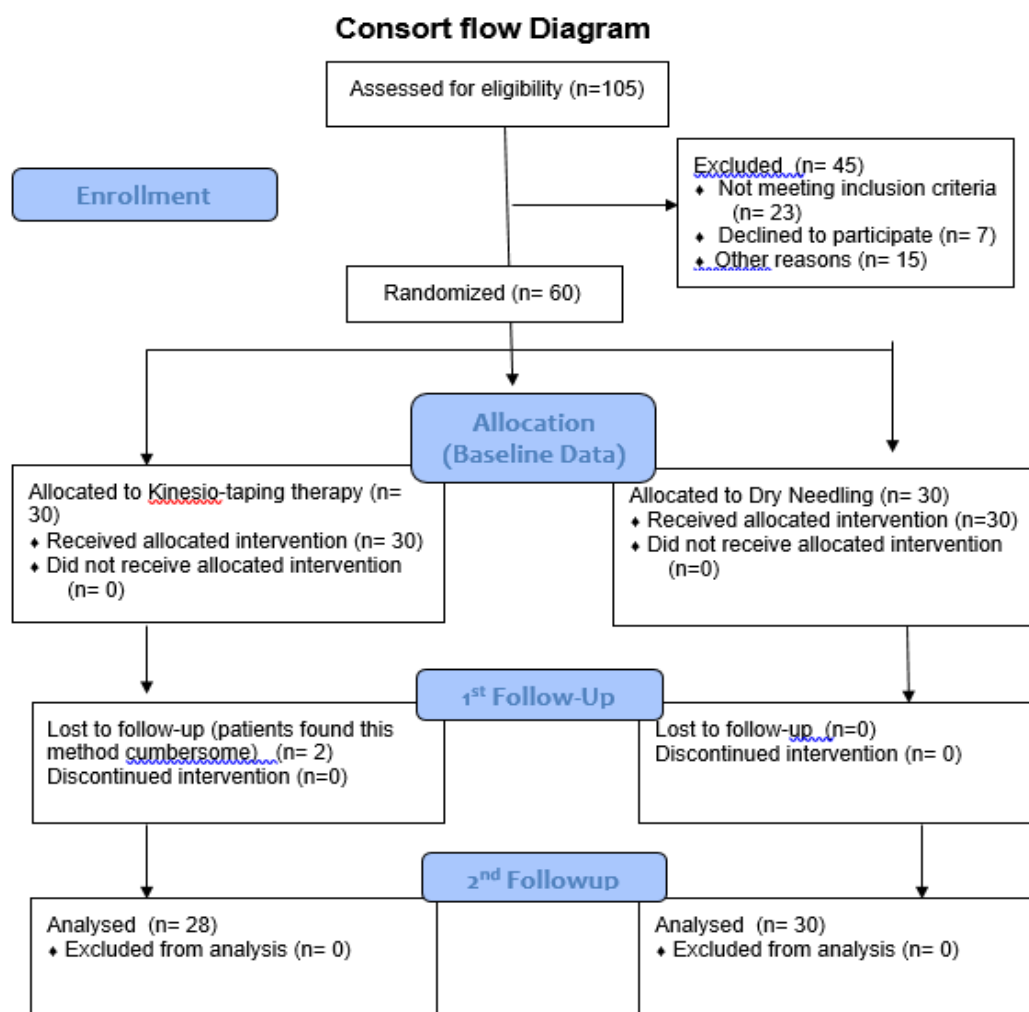
**House-Brackmann Facial Nerve Grading Scale:** This six-point scale (I to VI) assesses overall facial nerve function based on the degree of functional impairment.

### Data Collection and Statistical Analysis

Baseline assessments were conducted prior to intervention. Post-intervention data were collected at the third-week and sixth-week follow-ups. Written informed consent was obtained from all participants in both Urdu and English.

Data were analyzed using SPSS version 27. Normality was assessed using the Shapiro-Wilk test. Since the data were not normally distributed ( $p < 0.05$ ), non-parametric tests were applied: the Mann-Whitney U test for between-group comparisons and the Wilcoxon signed-rank test for within-group comparisons. A p-value less than 0.05 was considered statistically significant.

### CONSORT Flow Diagram



**Fig. 1: CONSORT Flow Diagram of Participant Enrollment and Allocation**

## RESULTS

### Demographic Characteristics

**TABLE I: AGE DISTRIBUTION OF PARTICIPANTS**

| Age Group (years) | Frequency (%) |  |
|-------------------|---------------|--|
| 30-39             | 41.38%        |  |
| 40-49             | 37.93%        |  |
| 50-59             | 20.69%        |  |

**TABLE II: GENDER DISTRIBUTION**

| Gender | Frequency | Percentage |  |
|--------|-----------|------------|--|
| Male   | 31        | 55.17%     |  |
| Female | 27        | 44.83%     |  |

**TABLE III: AFFECTED SIDE**

| Affected Side | Frequency | Percentage |  |
|---------------|-----------|------------|--|
| Right Side    | 34        | 55.17%     |  |
| Left Side     | 24        | 44.83%     |  |

**Test of Normality**

Shapiro-Wilk test results showed significant p-values ( $<0.05$ ) for all outcome variables, confirming non-normal distribution. Non-parametric tests were therefore applied for all subsequent analyses.

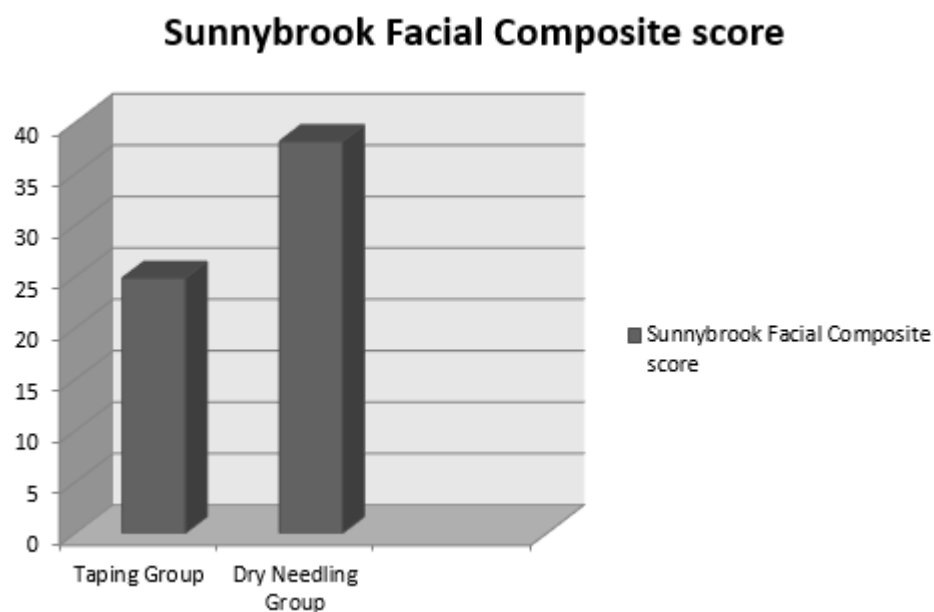
**Within-Group Analysis (Wilcoxon Signed-Rank Test)**

Both groups demonstrated significant improvements from baseline to the sixth week ( $p < 0.05$  for all variables), indicating that both interventions were effective in improving facial function.

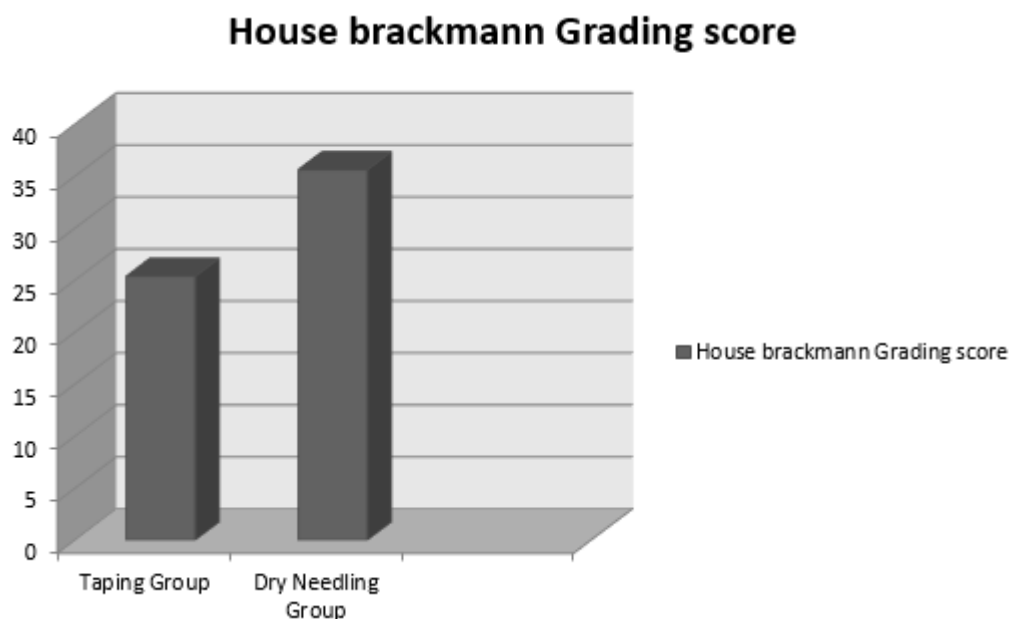
**Between-Group Analysis (Mann-Whitney U Test)****TABLE IV: COMPARISON OF OUTCOMES BETWEEN GROUPS**

| Outcome Measure  | Follow-up | Group 1<br>(Kinesiotaping)<br>Mean Rank | Group 2<br>(Dry Needling)<br>Mean Rank | P-Value |
|------------------|-----------|-----------------------------------------|----------------------------------------|---------|
| Sunnybrook Score | 3rd Week  | 20.38                                   | 32.72                                  | 0.002   |
| Sunnybrook Score | 6th Week  | 24.85                                   | 38.15                                  | 0.001   |

|                              |          |       |       |       |
|------------------------------|----------|-------|-------|-------|
| <b>House-Brackmann Score</b> | 3rd Week | 21.35 | 33.12 | 0.013 |
| <b>House-Brackmann Score</b> | 6th Week | 25.38 | 35.62 | 0.002 |



**Fig. 2: Comparison of Sunnybrook Facial Composite Scores Between Groups at 3rd and 6th Week**



**Fig. 3: Comparison of House-Brackmann Grading Scores Between Groups at 3rd and 6th Week**

The dry needling group demonstrated significantly greater improvement than the kinesiotaping group at both assessment time points for all outcome measures ( $p < 0.05$ ).

## DISCUSSION

This randomized controlled trial compared the effectiveness of kinesiotaping therapy and dry needling for treating acute Bell's Palsy. Both interventions resulted in significant within-group improvements; however, dry needling showed superior outcomes at both the three-week and six-week follow-ups.

Our findings align with previous research. A study by Mao et al. [6] found that combining acupuncture with Western medicine shortened treatment duration for Bell's palsy patients. Similarly, Goo et al. [7] reported that thread-embedding acupuncture led to faster and earlier recovery compared to sham treatment. Di Stadio et al. [8] demonstrated that facial taping combined with Kabat treatment significantly improved outcomes compared to Kabat treatment alone.

The physiological mechanisms underlying the superiority of dry needling may include: reduction of inflammatory markers such as TNF- $\alpha$ , IL-6, and IL-1 $\beta$ ; increased blood flow to the facial nerve through vasodilation; enhanced immune response via T-lymphocyte proliferation; and promotion of myelin repair and axonal regeneration [9-11]. Conversely, kinesiotaping is believed to work through proprioceptive feedback mechanisms, improved lymphatic flow, and mechanical support of weakened muscles [12]. While beneficial, these mechanisms may be less potent than the direct neuromodulatory effects of dry needling.

This study has several limitations. The six-week follow-up period may not reflect long-term outcomes, and the modest sample size limits generalizability. Additionally, the single-center design could introduce site-specific bias, while complete blinding of therapists was not feasible despite assessor and patient blinding.

## CONCLUSION

Both kinesiotaping therapy and dry needling are effective complementary treatments for acute Bell's Palsy. However, dry needling demonstrates significantly superior outcomes in improving facial symmetry, voluntary movement, and overall facial function. These findings suggest that dry needling may be the preferred physiotherapy intervention for patients with acute Bell's Palsy. Further large-scale, multicenter trials with extended follow-up periods are recommended to validate these results.

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