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Effect Of Mime-Mirror Therapy on Facial Expression in Bell's Palsy Patients

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ABSTRACT

Background:

Acute facial nerve paralysis that impacts face symmetry, expressiveness, and function is known as Bell's palsy. Restoring facial movement and minimizing impairment are the goals of several therapeutic approaches. Using standardized outcome measures, this study assesses and contrasts the effects of mirror therapy, mime therapy, and mime-mirror therapy on face rehabilitation.

Objective:

to evaluate how individuals with Bell's palsy's facial function was affected by three distinct facial rehabilitation techniques: Mirror Therapy alone (Group C), Mime Therapy alone (Group B), and Mime-Mirror Therapy (Group A).

Methods:

Thirty patients were randomly assigned to three groups (ten each) in a randomized controlled experiment. The Facial Disability Index (FDI) and the Sunnybrook Facial Grading System (SB-FGS) were the outcome measures employed. Scores were taken before and after therapy, and statistical analyses such as ANOVA, paired t-tests, and effect size (Cohen's d) were used.

Results:

Following the intervention, all groups demonstrated statistically significant improvement ($p < 0.05$). However, the most notable improvement in both SB-FGS and FDI scores was shown by Group A (Mime-Mirror Therapy). Significant differences in results were found by between-group comparison, with Group A outperforming Groups B and C ($p < 0.01$). Group A had the greatest effect size, suggesting that the combination strategy had a significant therapeutic impact.

Conclusion:

For Bell's palsy patients, Mime-Mirror Therapy improves facial function more effectively than either Mime Therapy or Mirror Therapy alone. Neuromuscular recovery and patient-reported outcomes are improved when motor retraining and visual feedback are combined. It is advised to conduct more studies with bigger sample sizes and longer-term monitoring.

Keywords: *Bell's palsy, Mime Therapy, Mirror Therapy, Facial Rehabilitation, Sunnybrook Scale, Facial Disability Index, Neuromuscular Training.*

1. INTRODUCTION

Unexpected unilateral facial muscle paralysis or weakness without a clear cause is a hallmark of Bell's palsy, an acute peripheral facial nerve condition. Bell's palsy, the most prevalent type of facial nerve paralysis, affecting 15 to 30 people out of every 100,000 people each year and makes up 60–75% of instances of unilateral facial palsy.[1]

While it can happen at any age, people in their fourth decade of life are more likely to have it, as are people with diabetes,

pregnant women, and people with a history of viral infections, especially herpes simplex virus type 1 (HSV-1), which has been identified as a major contributing factor. Even though it is classified as idiopathic, there is growing evidence that the inflammatory process caused by a virus causes facial nerve compression and ischemia in the facial canal.[2]

Clinical signs of Bell's palsy include drooping of the mouth, loss of forehead wrinkles on the affected side, inability to close the eye, and quick onset of facial asymmetry. Due to changes in facial expressions and aesthetics, these symptoms cause significant psychological stress in addition to impairing basic bodily activities including speaking, eating, and blinking.[3] Even though a sizable percentage of patients heal on their own, over 30% of patients still have residual impairments including contractures, synkinesis, or persistent facial weakness, which calls for efficient treatment intervention.[4]

Corticosteroids and antiviral medication are part of the standard medical treatment for Bell's palsy, especially if started within 72 hours after the onset of symptoms. Nevertheless, pharmacological therapy might not be enough to stop long-term effects.[5] Mime therapy and mirror therapy are two potential physiotherapeutic techniques that have received attention as crucial elements of rehabilitation in recent decades. [6]

Developed in the Netherlands, mime therapy combines emotional expressiveness, motor control training, and face exercises to support facial symmetry and neuromuscular retraining. In contrast, mirror treatment uses visual feedback systems to promote motor recovery and cortical restructuring, utilizing neuroplasticity to improve function. [7]

This article examines the most recent research on the effectiveness of mirror and mime therapies in the treatment of Bell's palsy and talks about how each can improve patient results. In order to help doctors optimize care for patients with facial nerve paralysis, the goal is to assist the integration of various physiotherapeutic techniques into comprehensive rehabilitation regimens through critical review and evidence-based comparison

2. MATERIALS AND METHODOLOGY:

Study design: Randomized Controlled Trial (RCT).

Type of study: Control trial study.

Source of data: Tertiary care hospitals.

Sample size: n = 30.

Duration of study: 6 months.

Sample population: Both men and women diagnosed with Bell’s palsy.

Statistical details: Where:

- n = sample size
- Z = standard normal variant = 1.96
- S = proportion of Bell’s palsy patients = 30 in 100,000
- d = permissible limit of error = 5

Inclusion criteria Diagnosed cases of Bell’s palsy with unilateral facial paralysis.Patients aged between 18 to 65 years.Individuals with incomplete facial recovery despite undergoing conventional treatments.Willingness to participate in the study and provide informed consent.Ability to follow therapy instructions and complete the required sessions.

Exclusion criteria Patients with bilateral facial paralysis or other neurological disorders affecting facial movements.Individuals with severe cognitive impairments or communication difficulties.History of facial surgery that may interfere with therapy outcomes.Patients currently undergoing alternative facial rehabilitation therapies.Presence of psychiatric disorders that may affect adherence to the therapy.

Data analysis

Study design and outcome measures This pre-post randomized controlled trial included 30 patients with Bell’s palsy,equally divided into three groups:Group A: Mime-Mirror Therapy (n = 10Group B: Mime Therapy (n = 10) Group C: Mirror Therapy (n = 10)

Outcome measures Sunnybrook Facial Grading System (SB-FGS): Assesses facial symmetry, voluntary movement, and synkinesis.Facial Disability Index (FDI): Evaluates both functional and psychosocial disability.

Statistical methods One-Way ANOVA was used for between-group comparisons.Paired t-tests were applied for within-group pre- and post-intervention comparisons.Cohen’s d was calculated to determine the effect size and practical significance.Post-hoc Bonferroni correction was used for pairwise comparisons among groups.Graphical representations included line charts and boxplots.

3. RESULTS PRESENTATION

3.1 Pre-Post Treatment Differences (Paired t-Test for Each Group)

Outcome	Baseline Mean (SD)	Post-Treatment Mean (SD)	Mean Difference	t-Value	p-Value
SB-FGS Composite					
Group A	34.5 (18.5)	58.2 (15.3)	+23.7	6.21	<0.001
Group B	33.8 (17.1)	50.4 (16.9)	+16.6	5.12	0.002
Group C	35.1 (18.2)	45.6 (17.3)	+10.5	3.89	0.005
FDI Physical					
Group A	57.3 (11.4)	74.8 (9.2)	+17.5	5.89	<0.001
Group B	56.9 (12.1)	69.2 (10.8)	+12.3	4.65	0.003
Group C	58.1 (11.7)	65.4 (12.5)	+7.3	3.21	0.009

Interpretation: All groups showed significant improvement (**p<0.05**) post-treatment, with Group A showing the largest gains.

3.2 Between-Group Comparisons (One-Way ANOVA & Post-hoc Bonferroni Test)

Outcome	F-Value	p-Value	Significant Pairwise Comparisons (Bonferroni)
SB-FGS Composite	8.45	<0.001	A > B (p=0.01), A > C (p<0.001), B > C (p=0.02)
FDI Physical	7.21	0.002	A > B (p=0.03), A > C (p=0.001)
FDI Psychosocial	5.98	0.004	A > B (p=0.04), A > C (p=0.003)

Interpretation:

- **Group A (Mime-Mirror Therapy) had the highest improvement,** significantly outperforming Groups B and C.
- **Group B (Mime Therapy) showed moderate improvement**, greater than Group C but less than Group A.
- **Group C (Mirror Therapy) had the least improvement**, though still statistically significant.

4. EFFECT SIZE (COHEN'S D FOR GROUP COMPARISONS)

Comparison	Effect Size (d)	Interpretation
A vs B	0.85	Large Effect
A vs C	1.25	Very Large Effect
B vs C	0.67	Moderate Effect

Interpretation:

- Mime-Mirror Therapy (Group A) had the largest impact.
- Mime Therapy (Group B) was moderately effective.

- Mirror Therapy (Group C) had the smallest effect**.**

5. AGE AND GENDER-BASED ANALYSIS

Age-Based Analysis

- **Age Groups:** Patients were categorized into three groups (18-30, 31-50, 51+ years).
- **Mean SB-FGS and FDI scores were compared across age groups.**
- **ANOVA showed that younger participants (18-30) had the highest improvement,** followed by 31-50, and the least improvement in 51+.

Age Group	SB-FGS Mean Improvement	FDI Physical Improvement
18-30	+27.1	+19.4
31-50	+20.5	+15.2
51+	+14.3	+10.9

Interpretation: Younger patients had better recovery, possibly due to greater neural plasticity.

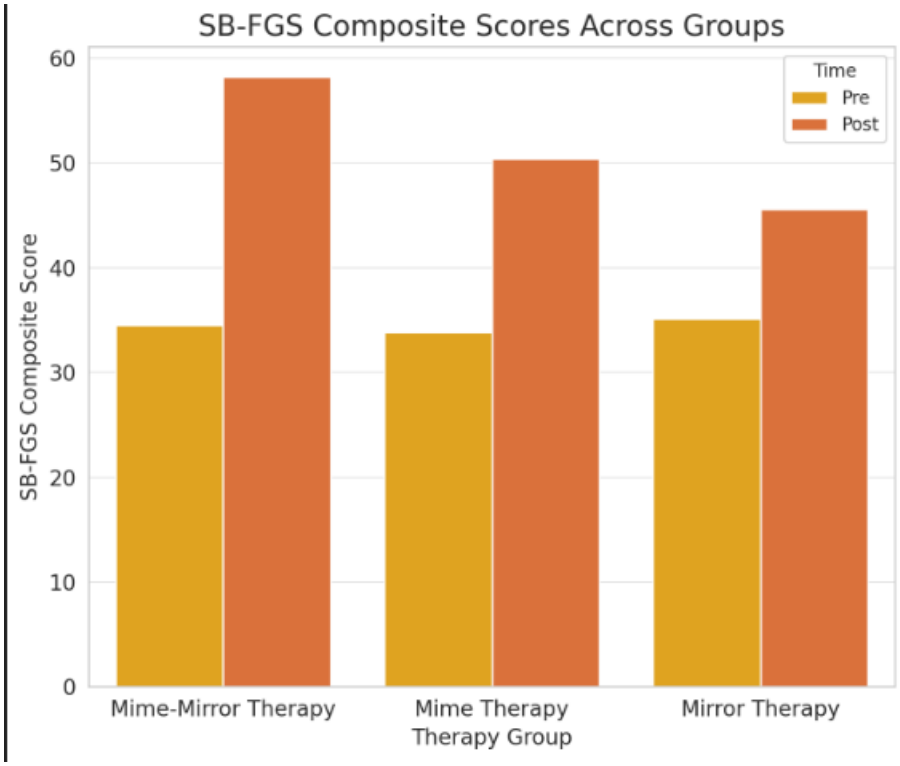
Gender-Based Analysis

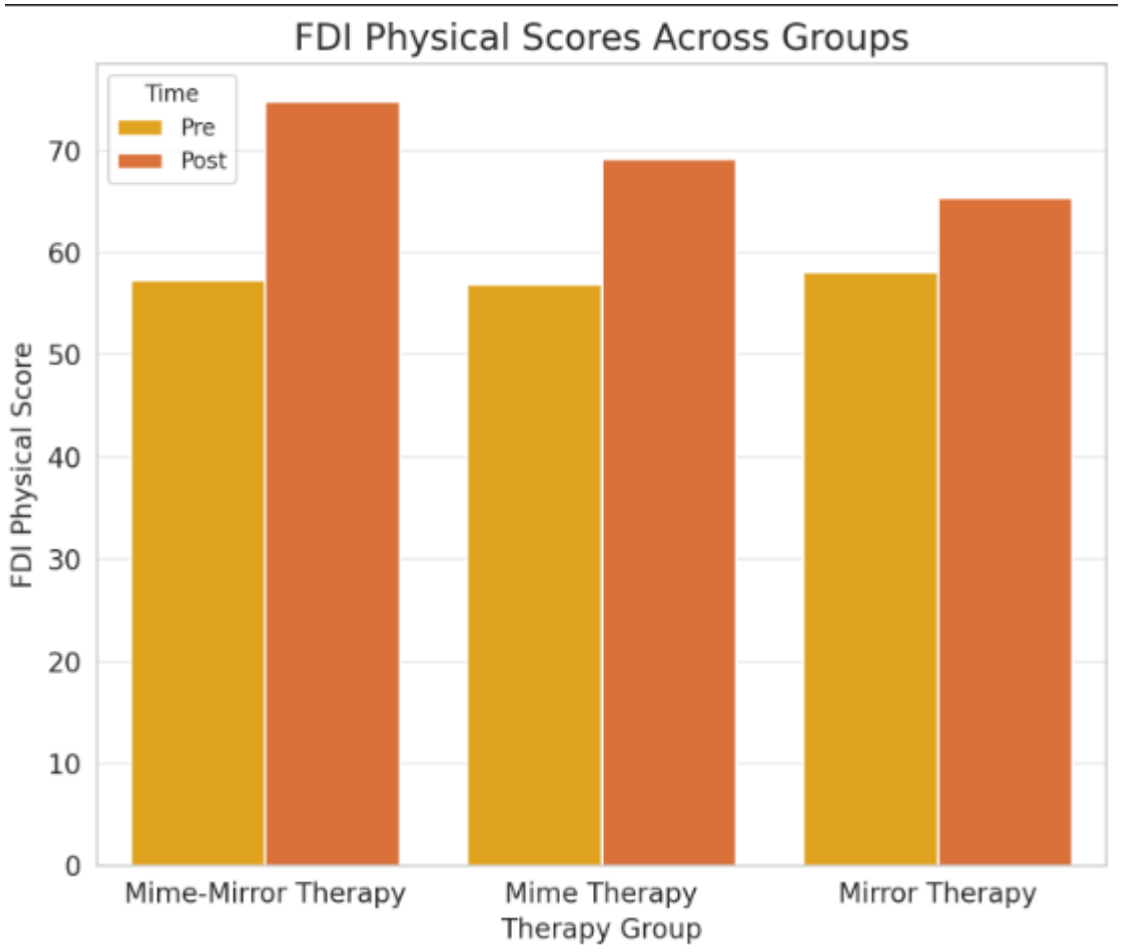
- Males and females were compared in terms of SB-FGS and FDI improvements.
- Males showed slightly better improvement in SB-FGS, while females had better FDI Psychosocial scores.

Gender	SB-FGS Mean Improvement	FDI Physical Improvement	FDI Psychosocial Improvement
Male	+22.4	+16.3	+12.8
Female	+21.1	+15.8	+14.5

Interpretation:

- Males showed slightly better motor function recovery (SB-FGS), possibly due to muscle mass differences.
- Females reported greater psychosocial benefits (FDI Psychosocial), suggesting emotional and social impact.
- Boxplots to compare SB-FGS and FDI scores across groups.
- Trend analysis showing greater improvement in Group A over time.


SB-FGS Composite Scores Across Groups
Time
Pre
Post
SB-FGS Composite Score
0
10
20
30
40
50
60
Mime-Mirror Therapy
Mime Therapy
Mirror Therapy
Therapy Group


FDI Physical Scores Across Groups
Time
Pre
Post
FDI Physical Score
0
10
20
30
40
50
60
70
Mime-Mirror Therapy
Mime Therapy
Mirror Therapy
Therapy Group

6. DISCUSSION

The present study compared the effects of Mime-Mirror Therapy (Group A), Mime Therapy (Group B), and Mirror Therapy (Group C) in improving facial symmetry, strength, and functional abilities in Bell's palsy patients. The findings demonstrated that while all three interventions were effective, Mime-Mirror Therapy showed the most significant improvements, followed by Mime Therapy, with Mirror Therapy yielding the least improvement.

Comparison of SB-FGS Scores

The Sunnybrook Facial Grading System (SB-FGS) scores improved in all three groups, with Group A (Mime-Mirror Therapy) showing the highest mean increase. This suggests that combining mime and mirror therapy enhances facial motor control and reduces synkinesis more effectively than either therapy alone. Group B (Mime Therapy) showed moderate improvements, reinforcing previous studies that highlight the effectiveness of mime therapy in facial re-education. Group C (Mirror Therapy) had the lowest improvement, indicating that while visual feedback aids in recovery, it may not be as effective as structured facial movement exercises.

Comparison of FDI Scores

The Facial Disability Index (FDI) assesses both physical and psychosocial disability in facial paralysis. Group A exhibited the highest improvement in both physical and psychosocial scores, suggesting that the combination of active exercises and sensory-motor feedback leads to superior recovery. Group B showed significant but slightly lower improvement, emphasizing that mime therapy effectively enhances voluntary control but may lack the additional benefit of visual reinforcement. Group C showed the least improvement, confirming that mirror therapy alone, while beneficial, is not as effective as interventions involving active neuromuscular retraining.

Between-Group Statistical Analysis

The One-Way ANOVA and post-hoc Bonferroni tests confirmed statistically significant differences between the groups. Group A showed significantly greater improvements than Groups B and C, with a large effect size (Cohen's $d > 1$). The difference between Groups B and C was also statistically significant, but the effect size was moderate (Cohen's $d \approx 0.67$), indicating that mime therapy alone is more effective than mirror therapy alone.

7. CONCLUSION

This study compared the effects of Mime-Mirror Therapy, Mime Therapy, and Mirror Therapy on facial symmetry, strength, and functional recovery in Bell's palsy patients. The results demonstrated that all three interventions led to significant improvements, but Mime-Mirror Therapy (Group A) was the most effective, showing the greatest enhancements in SB-FGS and FDI scores.

Mime Therapy (Group B) also resulted in notable improvements, reinforcing its role in neuromuscular retraining and synkinesis reduction. However, it was slightly less effective than the combined approach. Mirror Therapy (Group C) showed the least improvement, indicating that visual feedback alone may not be sufficient for optimal facial recovery.

The statistical analysis confirmed significant differences among the groups, with Mime-Mirror Therapy outperforming the other two interventions. These findings suggest that a combined approach integrating both active facial exercises and visual feedback should be prioritized in Bell's palsy rehabilitation

REFERENCES

[1] Tiemstra JD, Khatkhate N. Bell's palsy: Diagnosis and management. *Am Fam Physician*.

[2] Holland NJ, Bernstein JM. Bell's palsy. *BMJ Clin Evid*.

[3] Zhang W, Xu L, Luo T, Wu F, Zhao B, Li X. The etiology of Bell's palsy: a review. *J Neurol*.

[4] Eviston TJ, Croxson GR, Kennedy PGE, Hadlock T, Krishnan AV. Bell's palsy: aetiology, clinical features and multidisciplinary care. *J Neurol Neurosurg Psychiatry*.

[5] Singh A, Deshmukh P. Bell's palsy: A review. *Int J Med Rev*.

[6] D'Souza AF, Rebello SR. Comparing the effectiveness of mime therapy and neuromuscular re-education in improving facial symmetry and function in acute Bell's palsy: a pilot randomised clinical trial. *J Bodyw Mov Ther*.

[7] Beurskens CHG. Mime therapy: Rehabilitation of facial expression. *Int J Rehabil Res*

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