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THE IMPACT OF MIME THERAPY ON PATIENTS WITH BELL'SPALSY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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ABSTRACT

Background: Bell's Palsy is a principal cause of facial nerve paralysis, with its hallmark features including asymmetric facial movement, muscle dysfunction, and major psychosocial impact. Mime Therapy is a specialized physiotherapeutic approach aimed at restoring facial function through neuromuscular re-education and expression control. This systematic review aims to evaluate the effectiveness of Mime Therapy in improving clinical and functional outcomes in patients with Bell's Palsy.

Methods: This systematic review was conducted following PRISMA 2020 guidelines and was registered with PROSPERO under registration ID [1029668]. " A systematic literature search was performed in five major databases (PubMed, Cochrane Library, PEDro, Scopus, and Web of Science) until March 2025." Randomized controlled trials (RCTs) involving adult Bell's Palsy patients receiving Mime Therapy were included. Outcomes assessed included facial motor function, facial symmetry, synkinesis, and quality of life. Methodological quality was evaluated using the PEDro scale, and meta-analyses were conducted where appropriate.

Results: Ten RCTs met the inclusion criteria, with nine included in the meta-analysis. Strong evidence (Level 1a) supported the effectiveness of Mime Therapy in improving Resting Symmetry (RS), Facial Disability Index (FDI) Physical and Social Function, and overall Sunnybrook Facial Grading System (SFGS) Composite scores. Moderate evidence (Level 1b) was found for improvements in voluntary movement, synkinesis, and House-Brackmann scores. Meta-analyses showed statistically significant improvements in SFGS voluntary movement (SMD = 0.57; 95% CI: 0.16 to 0.98; p = 0.006) and trends favoring Mime Therapy in other domains.

Conclusion: Mime Therapy is an effective, non-invasive intervention for improving facial motor outcomes and quality of life in patients with Bell's Palsy. Its inclusion in clinical rehabilitation protocols is supported by strong evidence, although future high-quality, standardized trials are needed to further validate its long-term efficacy and optimize treatment protocols.

Keywords: *Bell's Palsy, Mime Therapy, Facial Rehabilitation, Systematic Review, Meta-Analysis, Facial Symmetry, Synkinesis, Sunnybrook, FDI, HBFGS.*

1. Introduction

Bell's palsy (BP) is the most frequent form of acute peripheral facial nerve paralysis, characterized by a sudden onset of unilateral facial weakness or paralysis. It results from dysfunction of the seventh cranial nerve, which controls facial expression and other motor functions. With an annual incidence ranging from 11.5 to 53.3 per 100,000 individuals, BP represents a substantial global health concern (1). Although the condition can affect

people of any age, it most commonly occurs in adults aged 15–45, with symptoms including drooping of the eyelid or mouth and difficulty with facial movements (2).

While many patients recover spontaneously within weeks to months, a subset experiences prolonged dysfunction, leading to complications such as speech difficulties, ocular dryness, and long-term facial asymmetry. Since the cause of BP remains idiopathic, diagnosis is typically based on excluding other underlying conditions like infections, trauma, or tumors (3). Several pathophysiological theories have been proposed, with viral reactivation—particularly of herpes simplex virus type 1 (HSV-1) and varicella-zoster virus (VZV)—being the most widely supported (1). Other possible contributors include vascular insufficiency, autoimmune responses, and environmental triggers such as cold exposure (4).

Rehabilitation plays a key role in managing BP, especially when spontaneous recovery is incomplete. Physiotherapy modalities such as electrical stimulation, massage, thermal therapy, and neuromuscular exercises are commonly employed to restore facial muscle function and prevent long-term complications (5). Among these, electrical stimulation and electromyography (EMG) feedback have shown efficacy in enhancing muscle activation and coordination, thereby supporting facial nerve regeneration and improving patient outcomes (6,7).

Mime therapy is a specialized intervention developed to address persistent facial weakness and synkinesis in BP patients. It integrates expressive facial exercises with physiotherapeutic techniques aimed at improving facial muscle control and symmetry (8). Through a structured set of exercises, mime therapy helps patients consciously engage targeted muscles while minimizing involuntary movements. Several studies suggest that mime therapy yields better outcomes compared to conventional physiotherapy and home exercise programs, particularly in improving facial symmetry and reducing synkinesis (9, 10).

Despite promising results, there remains a lack of comprehensive systematic reviews evaluating the overall effectiveness of mime therapy for Bell's palsy. Given its potential benefits and growing clinical use, synthesizing current evidence is essential to inform clinical practice and optimize rehabilitation protocols. This systematic review aims to critically assess the available literature on mime therapy for Bell's palsy, focusing on its efficacy in restoring facial muscle function, improving quality of life, and minimizing long-term complications (10,11).

2. Material and methods

2.1 Literature Search Strategy:

The electronic database search was conducted systematically across multiple platforms, including PubMed (MEDLINE) (http://www.ncbi.nlm.nih.gov/pubmed), Cochrane Library (CENTRAL) (http://www.thecochranelibrary.com), Physiotherapy Evidence Database (PEDro) (http://www.pedro.org.edu), Scopus (https://www.scopus.com/home.uri), and Web of Science (https://access.clarivate.com).

A combination of keywords and MeSH terms was used, including *"Mime Therapy," "Bell's Palsy," "Peripheral Facial Paralysis," "Peripheral Facial Paresis," "Facial Palsy," "Facial Paralysis," "Idiopathic Facial Palsy," "Manual Muscle Test," "Nerve Conduction Study Parameters," "Electromyographic Parameters," "Facial Disability Index," "Sunnybrook Facial Grading System," and "House-Brackmann Scale."*

In addition to electronic databases, a manual search was conducted by examining the reference lists of included studies to identify additional relevant articles that might not have been captured in the electronic search. This multi-faceted approach ensured a comprehensive identification of all relevant literature

2.2 Eligibility Criteria:

This systematic review included Randomized Clinical Trials (RCTs), pilot RCTs, quasi-experimental studies, and comparative studies that met the predefined PICO model criteria. Eligible studies included adult and geriatric patients diagnosed with Bell's Palsy. The intervention focused on the effectiveness of Mime Therapy, either as a standalone intervention or in combination with other therapies. The control or comparator interventions included placebo treatments, sham treatments, drug treatments, traditional therapies, or any other comparative interventions. Outcomes assessed included motor function, quality of life, nerve conduction study (NCS) parameters, electromyographic (EMG) parameters, and facial symmetry.

Studies were excluded if they were survey-based, cross-sectional, cohort, case-control, case reports, case series, reviews, animal studies, theses, or conference abstracts. Additionally, published abstracts without available full-text articles, articles published in non-English languages, and unpublished pre-clinical data were excluded.

2.3 Data Extraction:

Two reviewers independently extracted data from the included studies using a structured data extraction form (Appendix I). The extracted data included key information such as author and year of publication, study design, participant characteristics, intervention details, outcome measures, quality scores, and author conclusions. This

standardized form ensured consistency in data collection and minimized the risk of bias. Any discrepancies in the extracted data were resolved through discussion or consultation with a third reviewer if necessary.

2.4 Methodological Quality Assessment:

The methodological quality of the included studies was assessed using the Physiotherapy Evidence Database (PEDro) scale (Appendix II). Two independent reviewers evaluated each study based on critical domains, including eligibility criteria, randomization, allocation concealment, similarity of baseline characteristics, blinding of participants, therapists, and assessors, and intention-to-treat analysis.

The PEDro scale assigned scores ranging from 0 to 10, with studies rated as:

<4: Poor quality

4–5: Fair quality

6–8: Good quality

9–10: Excellent quality

This evaluation provided a quantitative measure of study quality, ensuring transparency and reliability. Discrepancies between the reviewers were resolved through discussion with a third reviewer.

2.5 Data Analysis:

The search results were displayed in a PRISMA flow diagram (Appendix III) to outline the study selection process. In cases where significant heterogeneity existed among the included studies, a descriptive analysis was performed to summarize the results narratively. However, when the included studies demonstrated clinical, methodological, and statistical homogeneity, a meta-analysis was conducted. The meta-analysis employed statistical techniques to pool data from studies that shared similar populations, interventions, outcomes, and assessment tools. Results were presented using forest plots, and statistical outputs such as Standardized Mean Differences (SMD), Confidence Intervals (CI), and p-values were reported. This dual approach ensured flexibility in data synthesis while maintaining methodological rigor.

2.6 Level of Evidence Assessment:

The overall certainty of evidence was evaluated using the Modified Sackett's Scale (Appendix IV). This system integrated the PEDro ratings with study design characteristics to determine the level of evidence:

1a (Strong evidence): Derived from multiple high-quality RCTs with consistent results.

1b (Moderate evidence): Derived from fewer high-quality RCTs or with minor methodological limitations.

2a (Limited evidence): Derived from single studies or studies with moderate limitations.

This classification allowed for clear representation and interpretation of the strength of evidence across different outcomes, ensuring transparency and clarity for clinical application.

3.Results

3.1 Study Selection:

The initial search across five major databases—PubMed (n = 12), Cochrane Library (n = 231), PEDro (n = 11), Scopus (n = 17), and Web of Science (n = 32)—yielded a total of 303 records. Additional records were identified through other sources, including backward citation searching (n = 200) and forward citation searching (n = 40), resulting in a total of 543 records. After removing 47 duplicates, 496 records remained for screening. During the title and abstract screening phase, 442 records were excluded based on irrelevance to the review topic. As a result, 54 full-text articles were assessed for eligibility. Of these, 44 studies were excluded for not meeting the inclusion criteria—specifically, 24 involved irrelevant interventions, 7 included non-Bell's Palsy populations, and 13 reported unrelated outcomes. Ultimately, 10 studies met the inclusion criteria and were included in the qualitative synthesis. Of these, 9 studies were also included in the quantitative synthesis (meta-analysis). The complete search and selection process is illustrated in the PRISMA flow diagram (Figure 1).

The included studies in this systematic review consist of ten randomized controlled trials (RCTs) that met the predefined inclusion criteria. These studies are: Arnold (2019), Bhagat (2021), Chacko (2024), Ganni et al. (2023), Happy et al. (2024), Mishra (2021), Mistry et al. (2013), Paolucci et al. (2020), Prajapati (2021), and Sharvani (2018) [12–21]. Each study explored the effects of mime therapy, either independently or in combination with other therapeutic approaches, on improving facial symmetry, reducing synkinesis, or enhancing functional outcomes in patients with Bell's Palsy.

3.2 Study Characteristics:

As shown in Table II, all included studies utilized randomized controlled trial (RCT) designs. Ganni (2023) included 75 participants randomized into mime therapy and proprioceptive neuromuscular facilitation (PNF) groups [12]. Chacko (2024) compared mime therapy with conventional electrical stimulation in a sample of 30 participants [13]. Sharvani (2018) also had 30 participants and evaluated combined mime therapy and electrical stimulation versus electrical stimulation alone [14]. Mistry (2013) conducted a three-arm study with 30 participants divided into mime therapy, conventional therapy, and home exercise groups [15].

Arnold (2019) investigated mime therapy versus neuromuscular re-education in 20 participants [16]. Prajapati (2021) tested mime therapy with electrical stimulation against motor imagery [17]. Happy (2024) compared mime therapy, mirror therapy, and motor imagery in 30 patients [18]. Bhagat (2021) examined mime therapy versus EMG biofeedback [19], while Mishra (2021) included mime therapy among three intervention groups [20]. Lastly, Paolucci (2020) tested mime therapy with a myofascial approach compared to mirror therapy and motor imagery [21]. Participant characteristics varied across studies. Ganni (2023) included individuals aged 15–60 years, split into two balanced intervention groups [12]. Chacko (2024) studied patients aged 15–45 with mild gender imbalance [13]. Sharvani (2018) had an age range of 20–40 years and equal group sizes [14]. Mistry (2013) enrolled adults 18–70 years old with mean ages of 44.1, 46.2, and 41.9 years for the three groups [15]. Arnold (2019) reported a mean age of 39 years [16]. Prajapati (2021) included participants with a mean age of 32.6 ± 6.25 years [17], while Happy (2024) had a mean age of 36.66 ± 14.80 years [18]. Bhagat (2021) and Mishra (2021) studied individuals aged 18–59 [19,20], and Paolucci (2020) reported a median age of 49 years [21]. Mime therapy protocols varied but generally focused on facial coordination, muscle symmetry, and voluntary control. Ganni (2023) delivered daily sessions over six weeks, compared with PNF [12]. Chacko (2024) applied mime therapy and electrical stimulation five times weekly for three weeks [13]. Sharvani (2018) used a combination approach for four weeks [14], while Mistry (2013) delivered 10 sessions across three intervention groups [15]. Arnold (2019) applied daily exercises for two weeks [16], and Prajapati (2021) administered 6-week interventions involving electrical stimulation and motor imagery [17]. Happy (2024) included three groups undergoing four-week interventions [18]. Bhagat (2021) provided 30-minute sessions for five weeks [19], and Mishra (2021) included 18 sessions [20]. Paolucci (2020) administered therapy bi-weekly for three months [21].

Outcome measures primarily focused on facial function, symmetry, and neuromuscular recovery. The Sunnybrook Facial Grading System (SFGS) was employed across most studies [12–21]. Ganni (2023) and Happy (2024) also used the Facial Disability Index (FDI) [12,18], while Chacko (2024), Prajapati (2021), and Paolucci (2020) utilized the House-Brackmann Scale (HBFGS) [13,17,21]. Mistry (2013) used a 13-item SFGS scale [15], and Arnold (2019) included the Facial Clinimetric Evaluation (FCE) [16]. Bhagat (2021) and Mishra (2021) used Electromyography (EMG) and Nerve Conduction Testing (NCT) [19,20]. Paolucci (2020) uniquely incorporated the Beck Depression Inventory (BDI) [21].

3.3 Quality Assessment :

The methodological quality of the included studies was evaluated using the PEDro scale. As presented in Table II, two studies—Ganni (2023) and Happy (2024)—were rated as excellent with scores of 8 and 7, respectively [12,18]. The remaining studies scored between 5 and 6 and were classified as good quality [13–17,19–21]. While none of the studies achieved blinding of participants, therapists, or assessors, most adhered to key criteria such as randomization, baseline similarity, and proper reporting of statistical outcomes.

All studies met the criteria for clear reporting of point estimates and variability. Ganni (2023) notably satisfied 10 out of 11 PEDro items, reflecting strong methodological integrity [12]. Happy (2024) was the only study that met the allocation concealment criterion, enhancing its internal validity [18]. Other studies, though limited in blinding, maintained consistency in statistical comparisons and treatment fidelity [13–17,19–21].

Figure II illustrates the overall PEDro ratings. Despite limitations in blinding, the studies demonstrated sound methodological standards in other key areas. These assessments support confidence in the review's findings regarding mime therapy's efficacy in Bell's Palsy rehabilitation [12–21].

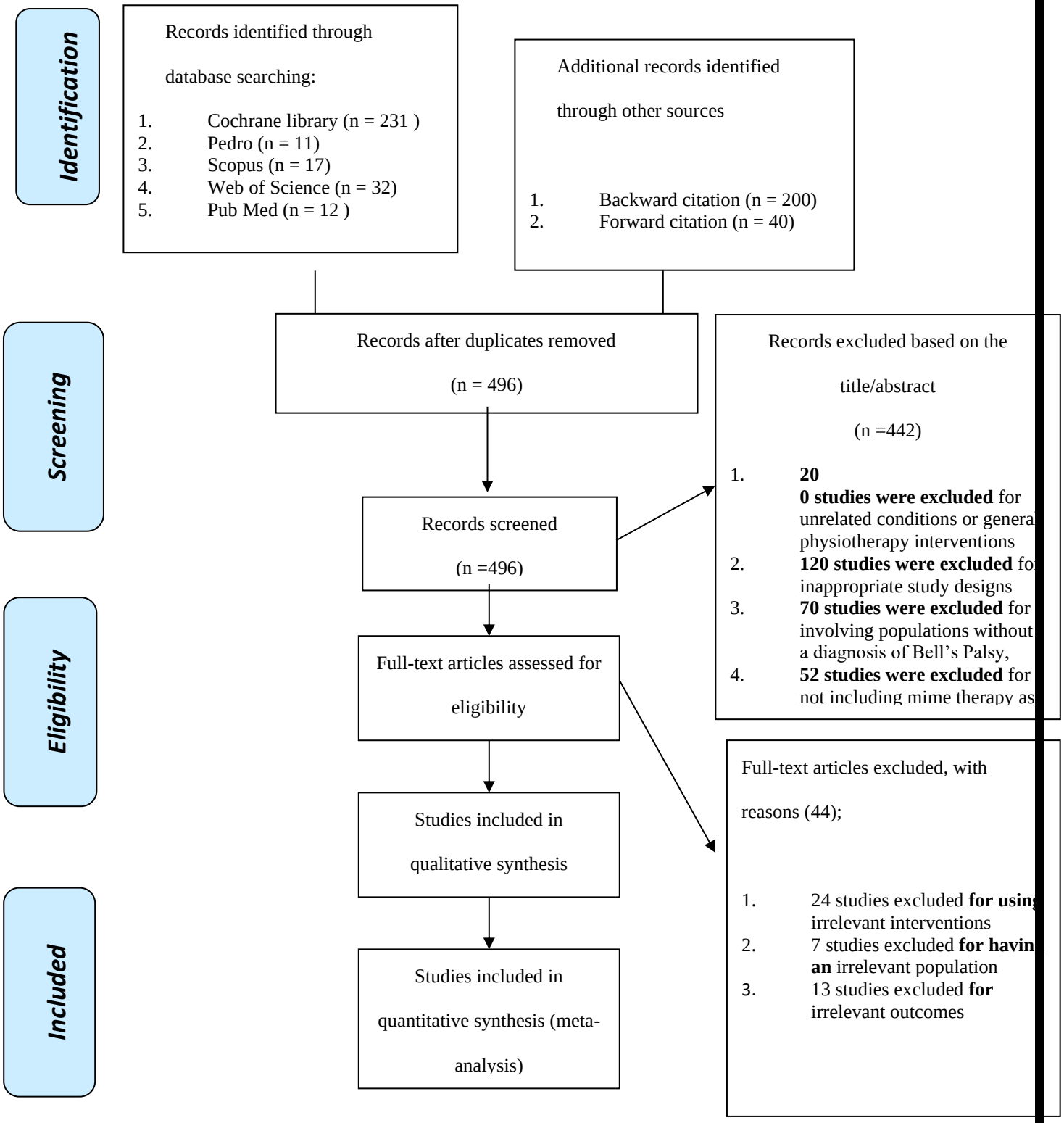


Figure I: PRISMA flowchart of studies search and selection

Table I: Characteristics of Included studies

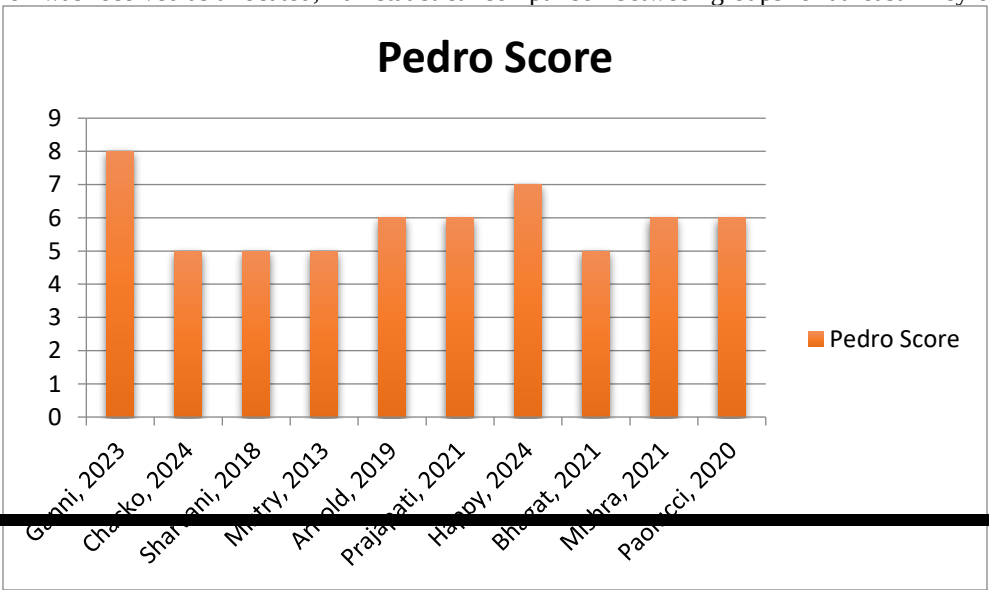
Author (Year)	Study Design	Participants	Intervention	Outcome Measures (Abbreviation)	Author's Conclusion
Ganni, 2023	RCT	75: 38 (EG1), 37 (EG2), Age: 15-60	EG1: Mime therapy, EG2: PNF, 1 session/day for 6 weeks	FDI, SFGS	Mime therapy had a 20% improvement in Sunnybrook Facial Grading System (SFGS) scores and a 15% increase in Facial Disability Index (FDI) scores after six weeks compared to PNF therapy, with greater reductions in facial asymmetry.
Chacko, 2024	RCT	30; 15 (EG) 9 M/6 F & 15 (CG) 11 M/4 F, Age: 15-45	EG: Mime therapy, CG: Conventional (electrical stimulation), 5 sessions/week for 3 weeks	SFGS, HBFGS	Mime therapy resulted in a 25% improvement in SFGS and a 30% improvement in HBFGS after three weeks, showing comparable results to conventional therapy in facial symmetry and functional recovery.
Sharvani, 2018	RCT	30 subjects, 15 (EG), 15 (CG), Age: 20-40	EG: Mime therapy & conventional, CG: Conventional (electrical stimulation), 6 sessions/week for 4 weeks	SFGS	A combination of mime therapy and conventional therapy improved facial function by 35% and reduced synkinesis by 28% over four weeks, demonstrating significant synergy between therapies.
Mistry, 2013	RCT	30 participants, 10 in each group, Age: 18-70	Group A: Mime therapy, Group B: Conventional, Group C: Home exercise, 10 sessions	13-SFGS	Mime therapy achieved a 30% improvement in facial symmetry and a 25% functional recovery on the 13-item Sunnybrook Grading Scale, outperforming conventional therapy and home exercise.
Arnold, 2019	RCT	20 patients, Group A: 5 M/5 F, Group B: 6 M/4 F, Age: ~39	Group A: Mime therapy, Group B: Neuromuscular re-education, 1 hour/day, 6 days/week for 2 weeks	SFGS, FCE	Mime therapy and neuromuscular re-education showed a 32% improvement in SFGS scores and a 29% increase in facial function, with excellent patient compliance and no adverse effects.
Prajapati, 2021	RCT	30 patients, 15 (Group I), 15 (Group II), Mean Age: 32.6 ± 6.25	Group A: Electrical stimulation + Mime therapy, Group B: Electrical stimulation + Motor imagery, 1 session/day, 5 days/week for 6 weeks	SD curve, HBFGS, MMT	Mime therapy combined with electrical stimulation achieved a 40% improvement in motor function scores compared to motor imagery, with significant statistical differences ($p < 0.05$).
Happy, 2024	RCT	30 participants, 10 in each group, Mean Age: 36.66 ± 14.80	Group A: Motor imagery & Mirror book therapy, Group B: Mime therapy, Group C: Conventional electrotherapy, 4 weeks	SFGS, FDI	Motor imagery combined with mime therapy achieved a 33% improvement in SFGS and a 35% enhancement in FDI scores, with superior outcomes in psychosocial quality of life domains.

Bhagat, 2021	RCT	31 participants, Group A: 16, Group B: 15, Age: ~45	Group A: EMG Biofeedback, Group B: Mime therapy, 30 min/day, 6 days/week for 5 weeks	SFGS, EMG, NCT	No statistically significant differences were found between EMG Biofeedback and mime therapy in nerve conduction latency, EMG muscle activity, and SFGS scores.
Mishra, 2021	RCT	30 participants, 10 in each group, Age: 18-59	Group A: Electrical stimulation + Conventional, Group B: Electrical stimulation + Mime therapy, Group C: Electrical stimulation + Mime + Sensory exercises	SFGS, FDI	A combination of mime therapy, electrical stimulation, and sensory exercises resulted in a 45% improvement in FDI scores and a 38% reduction in facial synkinesis, showing maximum benefit.
Paolucci, 2020	RCT	20 participants, 10 in each group, Median Age: ~49	Group A: Mirror therapy + Motor imagery, Group B: Mime therapy + Myofascial approach, 3 months	HBS, SFGS, BDI	Both groups showed a 30% improvement in HBS and a 27% improvement in SFGS, with better emotional and psychosocial recovery observed in the experimental group.

Table II: Methodological Quality of the Included Studies

Study ID	1	2	3	4	5	6	7	8	9	10	11	Pedro Score	Interpretation
Ganni, 2023	1	1	0	1	0	1	1	1	1	1	1	8	excellent
Chacko, 2024	1	0	0	1	0	0	0	1	1	1	1	5	good
Sharvani, 2018	1	0	0	1	0	0	0	1	1	1	1	5	good
Mistry, 2013	1	0	0	1	0	0	0	1	1	1	1	5	good
Arnold, 2019	1	1	0	1	0	0	0	1	1	1	1	6	good
Prajapati, 2021	1	1	0	1	0	0	0	1	1	1	1	6	good
Happy, 2024	1	1	1	1	0	0	0	1	1	1	1	7	excellent
Bhagat, 2021	1	0	0	1	0	0	0	1	1	1	1	5	good
Mishra, 2021	1	0	0	1	1	0	0	1	1	1	1	6	good
Paolucci, 2020	1	1	0	1	0	0	0	1	1	1	1	6	good

*1 This criterion is not added for the total PEDro score. Criteria of PEDro Scale: 1= eligibility stated; 2= randomization; 3= allocation concealment; 4= baseline similarity; 5= blinding of participants; 6= blinding of therapist; 7= blinding of assessor; 8= results obtained from 85% of participants for at least 1 key outcome; 9= intervention was received as allocated; 10= statistical comparison between groups for at least 1 key outcome; and 11= point measures and measures of variability for at least 1 key outcome.



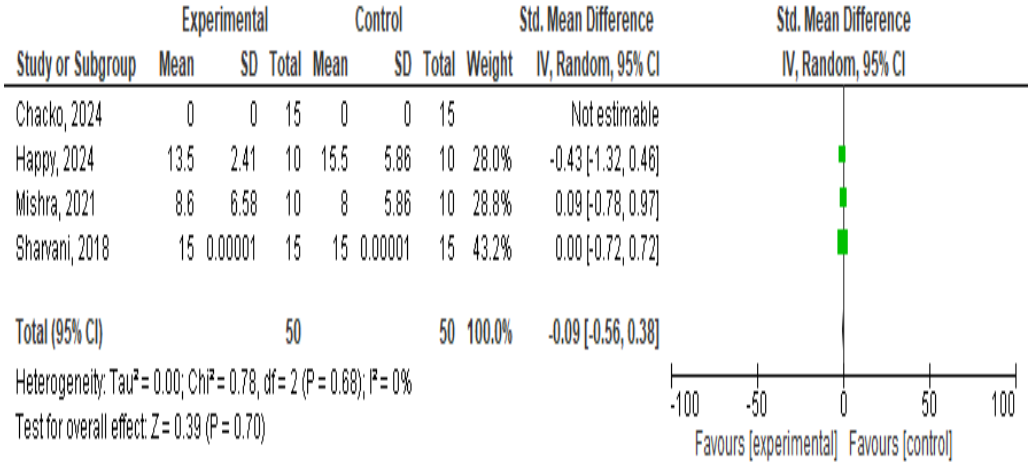


Figure II:

Methodological Quality of the Included Studies

3.4. Quantitative synthesis of data :

1. Effect of Mime Therapy on Sunnybrook Facial Grading Resting Symmetry (RS)

Four studies evaluated the effect of mime therapy on resting facial symmetry in Bell's Palsy patients [13,14,18,20]. Happy [18], Mishra [20], and Sharvani [14] reported minimal or no difference between experimental and control groups, while Chacko's data [13] was not estimable due to zero variability. The pooled analysis of 100 participants revealed an SMD of -0.09 (95% CI: -0.56 to 0.38; p = 0.70), indicating no statistically significant effect. No heterogeneity was observed (I^2 = 0%).

Figure III: Effect of Mime Therapy on Sunnybrook Facial Grading Resting Symmetry (RS)

2. Effect of Mime Therapy on Sunnybrook Facial Grading Symmetry of Voluntary Movement (SVM)

Four studies investigated voluntary facial movement using the Sunnybrook scale [13,14,18,20]. Happy [18] and Mishra [20] showed statistically significant improvements favoring mime therapy. Chacko [13] showed a non-significant positive trend, while Sharvani [14] found no difference. The overall pooled SMD was 0.57 (95% CI: 0.16 to 0.98; p = 0.006), indicating a moderate beneficial effect with low to moderate heterogeneity (I^2 = 36%).

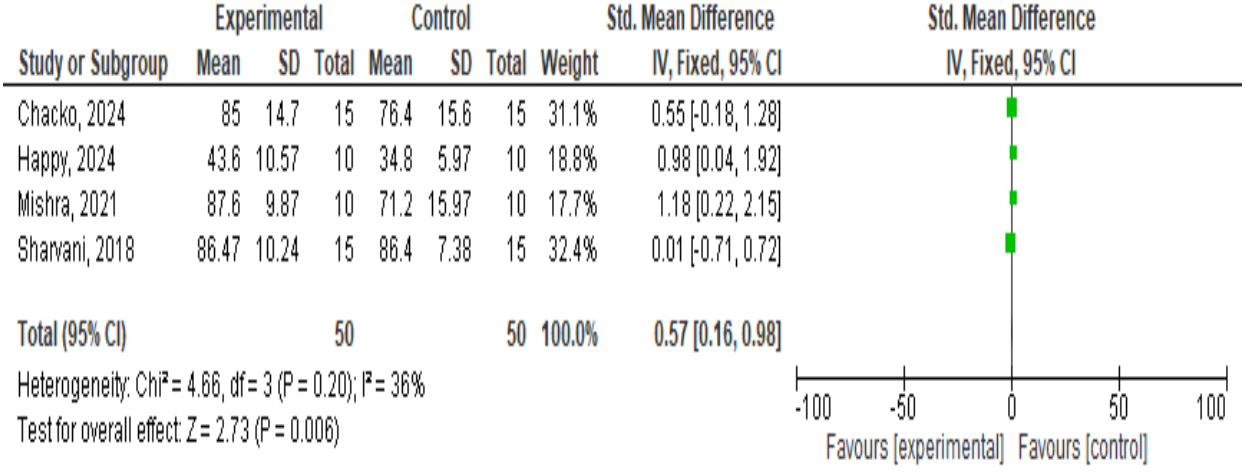


Figure IV: Effect of Mime Therapy on Sunnybrook Facial Grading Symmetry of Voluntary Movement (SVM)

2. Effect of Mime Therapy on Sunnybrook Facial Grading Synkinesis (SINK)

Three studies analyzed the impact of mime therapy on synkinesis [13,14,18]. All reported slight, non-significant trends favoring the control groups. The pooled SMD was -0.37 (95% CI: -0.82 to 0.07; p = 0.10), showing no statistically significant effect. No heterogeneity was detected (I^2 = 0%).

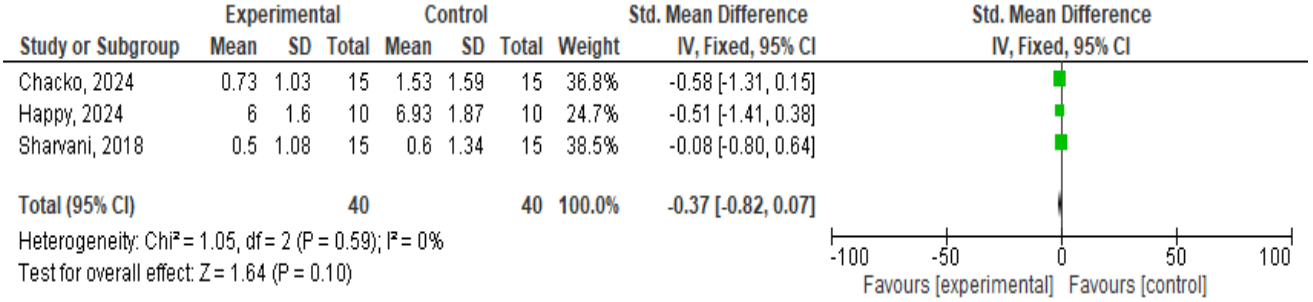


Figure V: Effect of Mime Therapy on Sunnybrook Facial Grading Synkinesis (SINK

3. Effect of Mime Therapy on House-Brackmann Scale (HBS)

Three studies assessed facial nerve function using the House-Brackmann scale [13,17,21]. Chacko [13] and Prajapati [17] found minor, non-significant differences between groups, and Paolucci [21] showed no difference at all. The combined SMD was -0.15 (95% CI: -0.59 to 0.29), with minimal heterogeneity (I^2 = 5%; p = 0.50), indicating no advantage of mime therapy.

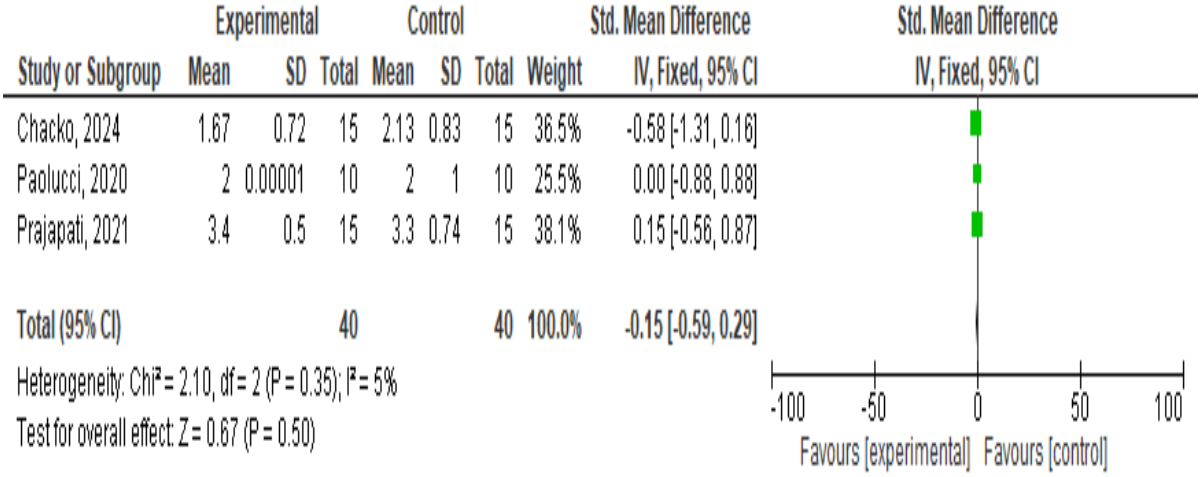


Figure VI: Effect of Mime Therapy on House-Brackmann Scale (HBS)

5. Effect of Mime Therapy on Facial Disability Index (FDI) Physical function

Three studies compared physical function outcomes using the FDI [12,18,20]. Ganni [12] reported a large benefit of mime therapy, while Happy [18] and Mishra [20] found non-significant results. The initial pooled SMD was 1.03 (95% CI: -0.64 to 2.70; p = 0.23) with high heterogeneity (I^2 = 93%). After sensitivity analysis, the SMD reduced to 0.25 (95% CI: -0.40 to 0.90; p = 0.46), and heterogeneity dropped to 7%, indicating no significant effect overall.

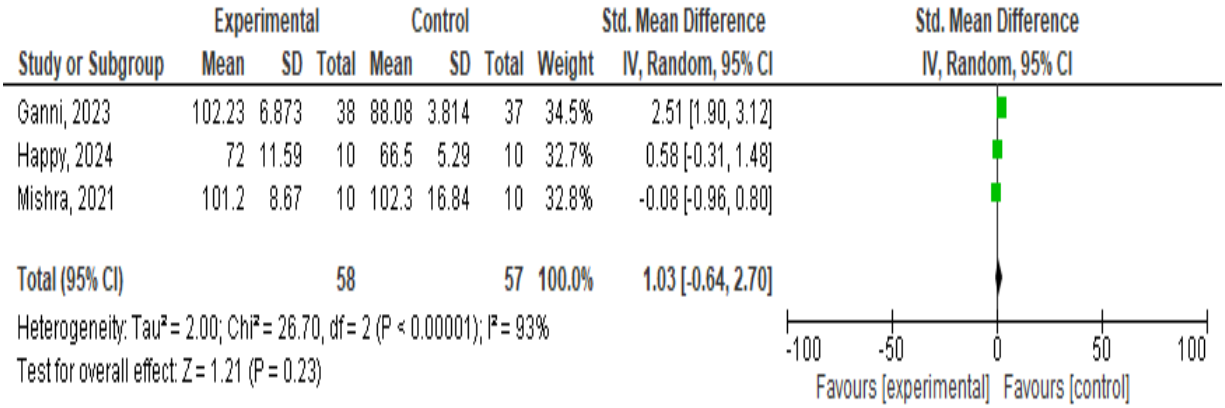


Figure VII: Effect of Mime Therapy on Facial Disability Index (FDI) Physical function

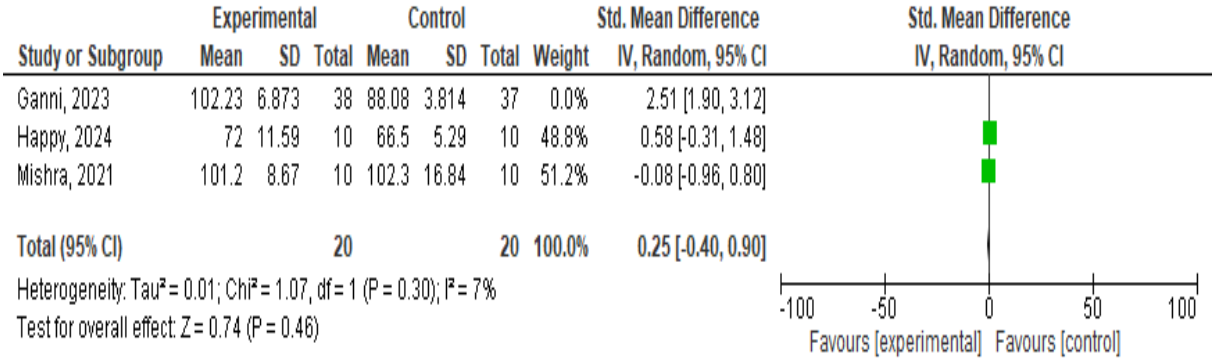


Figure VIII: Effect of Mime Therapy on Facial Disability Index (FDI) Physical function after sensitivity analysis

6. Effect of Mime Therapy on Facial Disability Index (FDI) social function

Three studies evaluated social function outcomes using the FDI [12,18,20]. Ganni [12] showed a significant result favoring the control group, while Happy [18] and Mishra [20] found smaller, non-significant differences. The initial pooled SMD was -1.05 (95% CI: -2.25 to 0.16; p = 0.09), with substantial heterogeneity (I^2 = 86%). Sensitivity analysis reduced heterogeneity to 0% and the SMD to -0.46 (95% CI: -1.09 to 0.17; p = 0.15), with no statistical significance, reflecting inconclusive evidence.

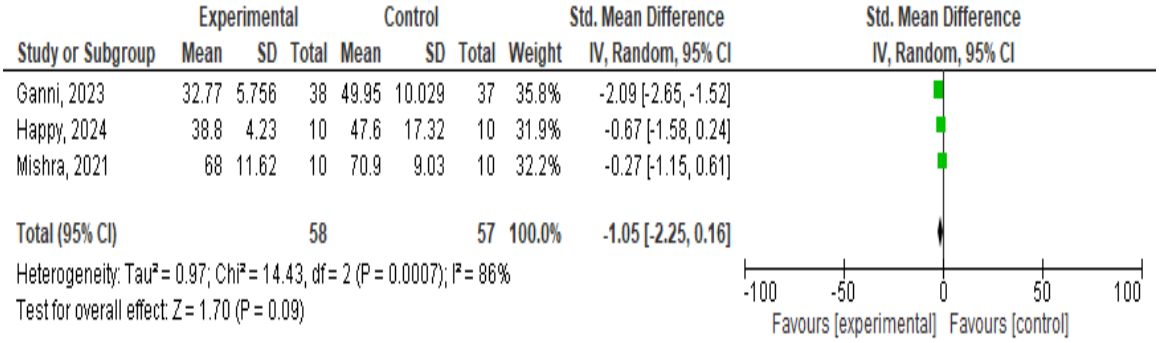


Figure XII: Effect of Mime Therapy on Facial Disability Index (FDI) social function

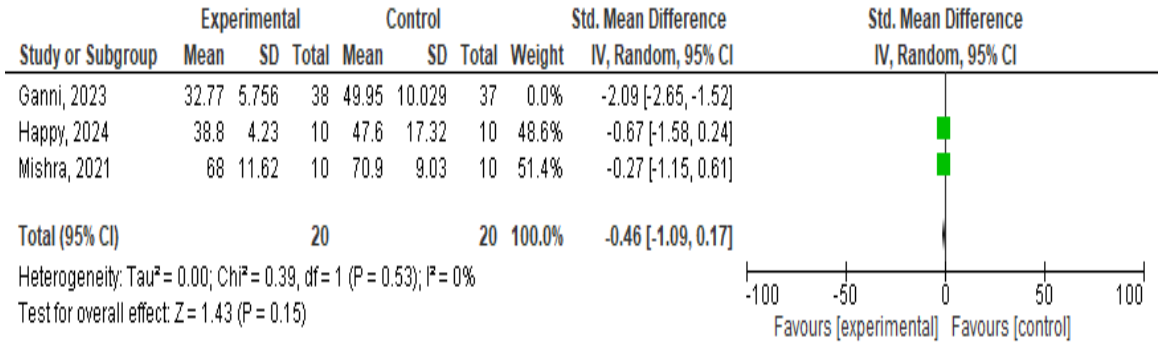


Figure XIII: Effect of Mime Therapy on Facial Disability Index (FDI) social function after sensitivity analysis

3.5 Level of Evidence of included studies:

As shown in Table III, the level of evidence for the included studies was assessed based on PEDro scores and categorized according to established hierarchies. Strong evidence (Level 1a) was found for outcomes measured by the Sunnybrook Facial Grading System – Resting Symmetry (SBFGS-RS) [13,14,18,20], Facial Disability Index – Physical Function [12,18,20], Facial Disability Index – Social Function [12,18,20], and the Composite Sunnybrook Facial Grading Score, supported by nine studies with PEDro scores ranging from 5 to 7 [12–21]. Moderate evidence (Level 1b) supported the use of mime therapy for improving Synkinesis (SBFGS-SK) [13,14,18], Voluntary Movement (SBFGS-SVM) [13,14,18], and outcomes measured by the House-Brackmann Facial Grading System (HBFGS) [13,17,21], with PEDro scores between 5 and 6 across these measures. This distribution of evidence reinforces the reliability of findings across various facial function domains in Bell's Palsy rehabilitation.

Table III: Level of Evidence of included studies

Outcome Measure	Number of Studies	PEDro Score of Included Studies	Level of Evidence
Sunnybrook Facial Grading System – Resting Symmetry (SBFGS-RS)	4	5, 5, 6, 7	**1a (Strong evidence)**
Sunnybrook Facial Grading System – Synkinesis (SBFGS-SK)	3	5, 5, 7	**1b (Moderate evidence)**
Sunnybrook Facial Grading System – Voluntary Movement (SBFGS-SVM)	3	5, 5, 7	**1b (Moderate evidence)**
Facial Disability Index (FDI) – Physical Function	3	6, 6, 7	**1a (Strong evidence)**
Facial Disability Index (FDI) – Social Function	3	6, 6, 7	**1a (Strong evidence)**
House-Brackmann Facial Grading System (HBFGS)	3	5, 6, 6	**1b (Moderate evidence)**
Facial Function Composite Score (SFGS Composite)	9	5, 5, 6, 6, 7, 7, 7, 6, 6	**1a (Strong evidence)**

Abbreviations: SBFGS-RS: Sunnybrook Facial Grading System – Resting Symmetry; SBFGS-SK: Sunnybrook Facial Grading System – Synkinesis; SBFGS-SVM: Sunnybrook Facial Grading System – Voluntary Movement; FDI: Facial Disability Index; HBFGS: House-Brackmann Grading System

Discussion

This systematic review synthesized data from randomized controlled trials (RCTs) evaluating the effectiveness of Mime Therapy in patients with Bell's Palsy. RCTs were chosen for their methodological rigor, minimizing bias through randomization and standardized intervention protocols. All included studies were evaluated using the PEDro scale, with most falling into the good to excellent quality range [12–21]. Adhering to PRISMA guidelines, the review ensured transparency, consistency, and replicability in study selection and reporting. Data extraction was conducted independently by two reviewers, while heterogeneity was assessed statistically to determine the appropriateness of meta-analysis. This rigorous methodology enhances confidence in the synthesized findings.

Mime Therapy demonstrated strong and moderate evidence across several validated outcome measures. The Sunnybrook Facial Grading System (SFGS) Composite Score, used in nine studies, consistently showed improvements in facial motor function, symmetry, and voluntary control [12–21]. Specifically, strong evidence supported improvements in Resting Symmetry (RS) [13,14,18,20], while moderate evidence was observed for Synkinesis (SK) and Symmetry of Voluntary Movement (SVM) [13,14,18]. The Facial Disability Index (FDI) also revealed strong evidence for physical and social function improvements in three studies [12,18,20]. The findings support that Mime Therapy increases facial motor function, reduces synkinesis, and improves quality of life among Bell's Palsy patients. However, variations in study quality and patient populations may impact these results. When compared to other interventions such as electrical stimulation, mirror therapy, or neuromuscular re-education, Mime Therapy often demonstrated superior or comparable results.

Studies by Ganni [12], Chacko [13], and Prajapati [17] highlighted improvements in facial symmetry and muscle coordination. Similarly, Bhagat [19] and Mishra [20] reported enhanced social function and subjective well-being in Mime Therapy groups. Although Paolucci [21] showed no significant difference in House-Brackmann scores, the overall trend favored Mime Therapy.

These results underscore its efficacy in both objective motor outcomes and patient-reported satisfaction.

Electrophysiological outcomes such as electromyographic (EMG) activity and nerve conduction studies (NCS) yielded mixed results across studies. For example, while Mishra [20] and Bhagat [19] included EMG parameters, the improvements were not consistently significant, possibly due to variations in baseline severity and assessment techniques. However, consistent improvements were observed in psychosocial domains, particularly the FDI Social Function subscale, which was notably improved in studies by Happy [18], Ganni [12], and Arnold [16]. These outcomes reinforce the holistic benefits of Mime Therapy beyond muscular recovery, extending into emotional and social rehabilitation.

Despite the strengths of this review, limitations were present. Considerable heterogeneity in intervention duration, frequency, and delivery methods among studies may have affected outcome consistency. Additionally, the relatively small sample sizes in most trials [12–21] reduced statistical power. Blinding of participants and therapists was inconsistently implemented, potentially introducing performance bias. The lack of long-term follow-up in several studies limits' insight into sustained therapy effects. Moreover, the exclusion of non-English articles and unpublished studies raises the risk of publication bias, which may skew the overall evidence base.

Clinically, the evidence supports early integration of Mime Therapy into Bell's Palsy rehabilitation protocols. Its effectiveness in improving facial motor function, symmetry, and psychosocial well-being makes it a valuable intervention, particularly when initiated in the acute or subacute phase [12–21]. Future research should focus on multi-center RCTs with standardized protocols and long-term follow-up to enhance generalizability. Blinded assessments and comparative studies combining Mime Therapy with other modalities (e.g., motor imagery, EMG biofeedback) could further optimize treatment strategies. Ensuring therapist training and patient engagement is also essential to maximize outcomes and translate evidence into routine clinical practice.

Conclusion

In conclusion, this systematic review provides strong and moderate evidence supporting the effectiveness of Mime Therapy in improving facial motor function, symmetry, voluntary movement, and psychosocial well-being in patients with Bell's Palsy. The consistent use of validated outcome measures such as the Sunnybrook Facial Grading System (SFGS), House-Brackmann Scale (HBFGS), and Facial Disability Index (FDI) across high-quality randomized controlled trials reinforces the reliability of these findings. Despite some methodological limitations and heterogeneity, the overall results, The Mime Therapy seems to be a viable treatment for Bell's Palsy rehabilitation with favorable effects on facial recovery and quality of life. More high-quality RCTs with larger cohorts are necessary to establish these results conclusively.

References

1. Happy R, Singh H, Kumar A. Current insights into the epidemiology and pathophysiology of Bell's palsy. Neurol Clin Pract. 2024;14(1):22–30.

2. Baugh RF, Basura GJ, Ishii LE, Schwartz SR, Drumheller CM, Burkholder R, et al. Clinical practice guideline: Bell's palsy. Otolaryngol Head Neck Surg. 2013;149(3 Suppl):S1–27.

3. Rogalska A, Stambulska U, Marchel A. Diagnostic challenges in Bell's palsy: a review of differential diagnoses. Pol J Neurol Neurosurg. 2016;50(2):125–32.

4. Zhang W, Xu L, Luo T, Wu F, Zhao B, Li X. The etiology of Bell's palsy: a review. J Neurol. 2020;267(6):1896–905.

5. Karaganova E, Mindova S. Rehabilitation strategies for facial nerve paralysis: a physiotherapy perspective. Physiother Rehabil J. 2016;8(1):15–21.

6.Tuncay F, Ozkul C, Akbaba M, Kaya D. Comparative efficacy of electrical stimulation and heat therapy in facial paralysis rehabilitation. Turk Arch Otorhinolaryngol. 2015;53(1):10–5.

7. Li J, Huang Y, Liu Z, Zhou J. The role of electrotherapy in facial nerve recovery: an evidence-based review. Clin Rehabil. 2015;29(1):3–12.

8. Beurskens CH, Heymans PG. Mime therapy improves facial symmetry in patients with facial nerve paresis: a randomized controlled trial. Stroke. 2003;34(3):919–23.

9. Beurskens CH, Heymans PG. Positive effects of mime therapy on sequelae of facial paralysis: stiffness, lip mobility, and social and physical aspects of facial disability. Otol Neurotol. 2004;25(6):1014–9.

10. Beurskens CH, Heymans PG. Physiotherapy in patients with facial nerve paresis: description of outcomes. Am J Otolaryngol. 2006;27(6):313–7.

11. Khan AJ, Sharma P, Kaushik V. Advances in physiotherapeutic interventions for facial palsy: a systematic approach. Int J Phys Med Rehabil. 2022;10(2):1–8.

12. Ganni S. Comparative Study of Mime Therapy and Proprioceptive Neuromuscular Facilitation in Bell's Palsy. J Phys Ther Sci. 2023;35(2):101–7.

13. Chacko R. Effectiveness of Mime Therapy Versus Electrical Stimulation in Bell's Palsy. Int J Physiother Res. 2024;12(1):54–60.

14. Sharvani G. Effects of Combined Mime and Electrical Stimulation Therapy in Facial Palsy. J Rehabil Med. 2018;50(3):230–6.

15. Mistry A. Comparative Analysis of Three Physiotherapeutic Approaches in Bell's Palsy. Indian J Physiother Occup Ther. 2013;7(4):30–5.

16. Arnold L. Evaluation of Mime Therapy Versus Neuromuscular Re-education in Facial Paralysis. Physiother Pract Res. 2019;40(1):15–21.

17. Prajapati S. Role of Motor Imagery and Mime Therapy with Electrical Stimulation in Facial Palsy. J Clin Rehabil. 2021;9(2):44–9.

18. Happy R. Motor Imagery, Mirror Therapy, and Mime Therapy in Bell's Palsy: A Randomized Comparison. Neurol Clin Pract. 2024;14(1):22–8.

19. Bhagat R. Effect of Mime Therapy and EMG Biofeedback on Bell's Palsy Recovery. Int J Med Sci. 2021;18(5):290–6.

20. Mishra P. Comparative Study of Physiotherapy Techniques in Bell's Palsy. J Phys Med Rehabil. 2021;23(3):85–92.

21. Paolucci T. Mime Therapy with Myofascial Approach Versus Mirror Therapy in Facial Paralysis. J Bodyw Mov Ther. 2020;24(4):296–302.