

Comparative Effects of Kabat Rehabilitation and Kinesiotaping on Functional Disability, Synkinesis and Patient Satisfaction in Patients with Bell's Palsy

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Author's Contribution

²Conception and design, ³Collection and assembly of data, ^{1,2,3}Analysis and interpretation of the data, *Statistical expertise, drafting of article, ⁴Critical revision of the article for important intellectual content, ²Final approval and guarantor of the article.*

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A B S T R A C T

Background: Bell's palsy is when one side of the face suddenly becomes paralyzed. This can cause problems with how the face moves and feels. Two different therapies, Kabat Rehabilitation and Kinesiotaping, have been used to try to make people with Bell's palsy feel better.

Objective: To compare effects of Kabat rehabilitation and Kinesiotaping on functional disability, synkinesis and patient satisfaction in patients with bell's palsy

Methodology: In a study with 72 participants aged 20 to 60, all diagnosed with Bell's palsy for less than two weeks, individuals were split into two groups. Group A underwent a treatment called Kabat Rehabilitation, while Group B received both Kabat Rehabilitation and Kinesiotaping. The study evaluated how well the face moved, unwanted facial movements, and patient satisfaction using specific measures. These evaluations were conducted at the beginning, middle (Week 3), and end (Week 6) of the study.

Results: In a study of Bell's palsy treatments, Kabat Rehabilitation and Kinesio Kabat Rehabilitation were compared. By Week 6, the Kinesio Kabat group demonstrated greater improvements in physical function (Avg Diff.=-6.97, P<0.001), social function (Avg Diff.=-10.36, P<0.001), and synkinesis (Avg Diff.=-3.25, P=0.024), with higher patient satisfaction (P=0.001). The results favor the Kinesio Kabat Rehabilitation approach based on these numerical evaluations.

Conclusion: Both Kabat Rehabilitation and Kinesiotaping are effective in improving functional disability and synkinesis in Bell's palsy patients. Kabat Rehabilitation showed slightly greater benefits in patient satisfaction at the later stage of treatment. These findings provide valuable insights into the efficacy of these rehabilitation techniques for Bell's palsy and highlight the importance of considering patient satisfaction as an essential outcome measure. Larger studies with longer follow-up periods are warranted to validate and expand upon these findings.

Keywords: Bell's Palsy, Functional Disability, Kabat Rehabilitation, Kinesiotaping, Patient Satisfaction, Physiotherapeutic Interventions, Synkinesis.

Introduction

Bell's palsy, a neurological disorder named after Scottish surgeon Sir Charles Bell, is marked by the sudden onset of temporary facial paralysis on one side of the face. It results from dysfunction in the seventh cranial nerve, also

referred to as the facial nerve, which Sir Charles first associated with the symptoms now recognized as characteristic of the condition. Physiotherapy plays a crucial role in the management of Bell's palsy by helping to maintain muscle tone in the affected facial muscles, stimulate the facial nerve, and prevent permanent contractures. Techniques such as Kabat

rehabilitation and kinesiotaping have shown promise in facilitating facial muscle function and symmetry. Protecting the eye from drying out and injury is important when the blink reflex is affected.¹⁻³

The application of Kinesiology Taping (KT) in treating Bell's palsy offers a non-invasive and potentially effective approach to address the facial muscle weaknesses and asymmetry associated with the condition. By applying KT to specific facial muscles, it aims to retrain and facilitate the paralyzed muscles, preventing overactivity of unaffected muscles, and promoting a desired symmetrical movement pattern.⁴⁻⁶

Kabat rehabilitation, also known as proprioceptive neuromuscular facilitation (PNF), plays a vital role in the comprehensive management of Bell's palsy. This technique aims to maximize recovery by re-educating and strengthening the facial muscles while maintaining symmetry and preventing overactivity of normal muscles. Kabat rehabilitation utilizes selective motor training to facilitate symmetrical movement and control undesired gross motor activity.⁷⁻⁹

The rationale behind conducting the present study on "Comparative Effects of Kabat Rehabilitation and Kinesiotaping on Functional Disability, Synkinesis, and Patient Satisfaction in Patients with Bell's Palsy" is to address the often-overlooked issue of residual impairment in Bell's palsy treatment. Despite significant advancements in managing the acute phase of Bell's palsy, long-term functional and aesthetic outcomes remain critical areas of concern. The study seeks to explore and compare the effectiveness of Kabat rehabilitation and kinesiotaping, individually and in combination, in managing residual impairment, synkinesis, and patient satisfaction. By identifying the most effective approach, the study aims to provide evidence-based recommendations for optimizing Bell's palsy treatment outcomes and enhancing the overall quality of life for affected individuals.^{10, 11}

While treating Bell's palsy or fascial palsy, the residual impairment is left untreated because once the patients achieve major milestones, these are discounted. However, the Kabat rehabilitation protocol can achieve maximum recovery, which includes synkinesis. The rationale behind the study is that while treating Bell's palsy or fascial palsy, the residual impairment is left untreated. Kinesiotaping has the ability to both support and facilitate facial expressions at the same time. The purpose of this study is to determine an approach that is the best combination of the two that have been discussed. People who suffer from Bell's palsy will find relief from their symptoms as a result of this treatment. This has the potential to be a significant benefit to the community as well.¹²⁻¹⁴

Methodology

Randomized Controlled Trial was conducted at Physiotherapy department of District Head Quarter Hospital, Sheikhpura after the approval taken from ethical committee of University of Lahore (Ref: REC-UOL-369-04-2023). The total sample size was 72 that is 36 allocated in each group by non-probability Purposive sampling technique.¹⁵

The study included Age between 20-60 years¹⁶, Both male and female, Patients Diagnosed bell's palsy, Patients with Disease Duration less than 2 weeks, Patients with Grade II-VI on the House-Brackmann Scale have been included in the study.¹⁶ Patients with Upper Motor Neuron Facial Palsy¹⁶, Participants having Infection of Middle Ear, Participants having Tumor of Parotid Gland, Patients with Malignant Otitis Externa, Patients having Tumors of the Base of The Lateral Skull, Patients having Polyneuropathie, Any contraindications for kinesiotaping like sunburn, bruising, cuts are excluded. Group A: Kabat rehabilitation protocol: This approach proves particularly rational for facial muscles due to their diagonal orientation and cross-facial nerve innervations, which allow for easy transmission of stimuli to the upper facial region. The method focuses on three distinct fulcrum points: the upper, intermediate, and lower fulcrum. The upper fulcrum, comprising the forehead and eyes, is interconnected vertically with the intermediate fulcrum, located around the nose area. Meanwhile, the lower fulcrum, responsible for chewing and articulatory movements, aligns horizontally. The process involves stretching, applying maximal resistance, utilizing manual contact, and providing verbal input to activate specific facial muscles. For instance, in the upper fulcrum, muscles like the frontal, corrugators, and orbicularis are activated by traction movements either upwards or downwards, always following a vertical plane, depending on the desired function. Similarly, the intermediate fulcrum's targeted muscles, such as the common elevator of the ala nasi and the upper lip, are engaged through traction movements in the opposite direction, following a vertical line. As for the lower fulcrum, specific maneuvers focus on the risorius and orbicularis oris muscles in a horizontal plane, along with the mental muscle in a vertical plane. Group B Kinesiotaping: The protocol involved the application of Kinesiotape to different facial areas following precise steps. Frontalis muscle for the frontalis muscle, two strips of Kinesiotape were prepared. The first strip was anchored over the superior portion of the forehead, using only 10% paper backing stretch to facilitate the frontalis muscle. The second strip was placed just lateral to the first one, applying a slight stretch. As the tape recoiled, it facilitated the contraction of the frontalis muscle, contributing to

improved forehead movements and expressions. Orbicularis **oculi muscle**: To target the orbicularis oculi muscle, four small I strips of Kinesiotape were prepared. The strips were applied from medial to lateral with a 10-15% stretch, following the direction of the eyelid closure. The lower eyelid was taped similarly, using the recoiling force of the tape to aid in the closure movement of the lower eyelid. Zygomaticus For the zygomaticus muscle, one Y strip of Kinesiotape was prepared. The anchor point was placed on the temporomandibular joint. The patient was asked to stretch the skin in the opposite direction, and the tape was applied with a 15-20% stretch. The tape's superior tail pointed towards the upper lip, and the second lower tail was applied in the same manner. Oris orbicularis: Lastly, the oris orbicularis muscle was targeted. Strips of Kinesiotape were applied to the upper and lower lip areas. The patient was asked to open their mouth to stretch the muscle, and the tape was applied with a 15-20% stretch. No tension was applied at the center to ensure comfort. Removing tape When removing physiology tape, peel the skin from it, not the tape. First, ensure you remove the tape in the same direction as the hair below it, and don't rip it off like a plaster! Start slowly, folding the corners of the sting back bit by bit, making sure the removed tape is on the back of the applied tape, not on your arm. While scraping the tape, hold the skin down with the other hand and pull it between the tape. This helps skin and tape separate quickly and painlessly. If the tape is on a furry part of the body, press on it as you peel it off to avoid pain. Shaving the area before applying tape is preferable, but it's not always necessary.

Results

Means of ages in both groups. Mean and S.D of age are 44.6667±8.52224 for group Kabat Rehab and 45.4167±9.96100 for group Kinesio Kabat Rehab. The percentage of male gender in Kabat group is 41.67%, while the female percentage is 58.33%. The percentage of male in

Kinesio Kabat rehab is 36.11%, while the female slice is 63.89%. Independent sample T test for FDI Physical Function Scores, FDI Social Scores, SAQ Scores.

Discussion

A protocol of systematic review and meta-analysis," by Zhang Q, Zhu C, Liu J (2020). Though not directly aligned with the present study's focus on Kabat Rehabilitation vs. Kinesio Kabat Rehabilitation, the cited research offered vital insights into the general effectiveness of kinesiotherapy. The present study supports the effectiveness of Kinesio Kabat Rehabilitation over Kabat Rehabilitation in treating Bell's palsy patients within a 6-week frame. However, differences in target populations and methodologies between the present study and the cited research highlight the necessity for further exploration. Investigating the long-term effectiveness and more diverse applications of these treatments would extend the knowledge base and possibly affirm the superiority of Kinesio Kabat Rehabilitation in various therapeutic contexts.¹⁷

The 2018 study conducted by Yang L, Zhang K, Zhang W, and Zhuang Z adds another dimension to the field. While our research focuses on the comparative efficacy of Kabat Rehabilitation and Kinesio Kabat Rehabilitation, the study by Yang L et al. explores the prognosis of Bell's palsy through a completely different lens - electroacupuncture at various acupoints. The common thread between both studies is the targeted population: patients suffering from Bell's palsy. However, the methodologies are considerably distinct. Improvement Over Time: Both studies observed enhancements in patients' condition. In our research, this was evidenced through measures like FDI Physical Function, FDI Social scores, SAQ scores, and patient satisfaction scores. In contrast, the Yang L et al. study utilized electric excitability as their main measure. The specificities of these measures make a direct comparison difficult.¹⁸

Table I: FDI physical function scores.

Independent Samples t test-Outcome Variables	Kabat Rehab		Kinesio Kabat Rehab		t	Avg Diff.	P Value
	Mean	SD	Mean	SD			
Baseline: FDI Physical Function	11.53	3.11	11.61	3.14	-0.11	-0.08	0.910
Week 3: FDI Physical Function	19.64	3.39	23.17	3.25	-4.51	-3.53	0.000
Week 6: FDI Physical Function	27.75	3.86	34.72	3.75	-7.78	-6.97	0.000
FDI Social Scores							
	Mean	SD	Mean	SD			
Baseline: FDI Social	22.92	6.45	21.61	5.16	0.95	1.31	0.346
Week 3: FDI Social	30.58	6.46	35.47	5.16	-3.55	-4.89	0.001
Week 6: FDI Social	36.92	6.47	47.28	5.24	-7.47	-10.36	0.000
SAQ Scores							
Baseline: SAQ	47.44	5.97	46.72	5.28	0.54	0.72	0.588
Week 3: SAQ	62.58	6.26	65.78	5.41	-2.32	-3.19	0.023
Week 6: SAQ	77.58	6.53	80.83	5.33	-2.31	-3.25	0.024

Mann Whitney U Test- Outcome Variables		Kabat Rehab		Kinesio Kabat Rehab		Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
		Mean Rank	Sum of Ranks	Mean Rank	Sum of Ranks				
Baseline: Patient Satisfaction		35.17	1266.00	37.83	1362.00	600	1266	-.554	0.579
Week 3: Patient Satisfaction		34.64	1247.00	38.36	1381.00	581	1247	-.906	0.365
Week 6: Patient Satisfaction		29.69	1069.00	43.31	1559.00	403	1069	-3.178	0.001

Friedman's ANOVA				
Group		Mean Rank	Chi Square	P Value
Kabat Rehab	Baseline: Patient Satisfaction	1.32	39.000	0.000
	Week 3: Patient Satisfaction	2.49		
	Week 6: Patient Satisfaction	2.19		
Kinesio Kabat Rehab	Baseline: Patient Satisfaction	1.35	38.581	0.000
	Week 3: Patient Satisfaction	2.31		
	Week 6: Patient Satisfaction	2.35		

The study by Alptekin D, titled "Acupuncture and Kinesio Taping for the acute management of Bell's palsy: A case report," was published in *Complementary therapies in medicine* in 2017. This study's objective was to evaluate the effectiveness of acupuncture and Kinesio Taping in the acute management of Bell's palsy. It is different from our research as it appears to be a case study focusing on a single individual suffering from acute Bell's palsy, whereas our research involved a broader population of Bell's palsy patients. The treatment methodology used in the Alptekin D study involved the use of acupuncture and Kinesio Taping, which differs from the Kabat Rehabilitation or Kinesio Kabat Rehabilitation methods used in our research. Comparing the findings of the two studies, some similarities and differences can be identified. Both studies found a level of success with their respective treatments in terms of improvement in the condition of Bell's palsy patients. However, given the different treatment methodologies and the fact that the Alptekin D study is a case report focused on one patient, the direct comparison of results might not provide a fully accurate comparison. Notably, while both studies found improvements in patients' conditions, the specific outcome measures used differed. In the Alptekin D study, the measures included improvement in symptoms and facial nerve function, while our study focused on outcomes such as the FDI Physical Function, FDI Social scores, SAQ scores, and patient satisfaction scores.⁶

Conclusion

The study comparing the effects of Kabat rehabilitation and Kinesiotaping on Bell's palsy patients revealed significant improvements in functional disability and synkinesis for both

interventions. At Weeks 3 and 6, the Kinesiotaping rehabilitation group demonstrated higher scores in both areas. Patient satisfaction scores were comparable at baseline and Week 3, but at Week 6, the Kinesiotaping rehabilitation group reported higher satisfaction. These results support the alternative hypothesis, indicating that both interventions are effective, with Kinesiotaping rehabilitation showing greater benefits in patient satisfaction at the later stage. Further research with larger samples and longer follow-up is needed to validate these findings.

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