Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Management of Physiotherapy With Infrared (IR), Electrical Stimulation, and Massage on Bell's Palsy Dextra

Novita Sabila Ramdhani[1], Suci Amanati[2]
Prodi Fisioterapi Program Diploma Tiga, Universitas Widya Husada Semarang

Article Info
Keywords:
Physiotherapy Management,
Infra Red,
Electrical Stimulation,
Massage,
Bell's Palsy Dextra

ABSTRACT
In this study, the case raised was a 17-year-old patient with Bell's Palsy Dextra who experienced complaints in the form of a deviation of the face to the left, weakness of the muscles of the right face, and disturbances when eating and drinking. Based on theory and literature review, the management of physiotherapy in Bell's Palsy includes the use of Infra Red to improve blood circulation and reduce pain, Electrical Stimulation to stimulate facial muscles and nerves, and Massage to improve the strength and function of facial muscles. Method In this research, this is a case study, raising patient cases and collecting data through the physiotherapy process. The modalities provided are Infra Red, Electrical Stimulation, and Massage. Conclusion In this study, the management of physiotherapy with Infra Red, Electrical Stimulation, and Massage for four times of therapy was proven to be effective in increasing facial muscle strength, reducing the level of pressure pain, and improving facial expression function in patients with Bell's Palsy Dextra. These results support that the combination of these three modalities can speed up the rehabilitation process and improve the overall quality of life of patients.

Corresponding Author:
Novita Sabila Ramdhani
Widya Husada University Semarang
novitasyabilla@gmail.com

INTRODUCTION

Body health is very important in our daily lives to carry out various activities. One of the crucial aspects is the face, which serves to express yourself. If the face has a lesion, the individual who experiences it will have difficulty in expressing themselves, thus limiting their functional abilities. Bell's palsy (BP) was first introduced in 1812 by Sir Charles Bell, a researcher Scotland, which studies the innervation of facial muscles. Bell's palsy is an acute weakness or paralysis of the peripheral facial nerve. Bell's palsy is the most common type of facial paralysis, with an incidence of about 20-30 per 100,000 individuals. To date causes Bell's palsy It is still unclear. There are five main theories that are thought to be the cause Bell's palsy i.e. anatomical structure, infection, virus, ischemia, inflammation and cold stimulation (1).

Bell's Palsy is an acute unilateral facial muscle weakness, which affects the peripheral nerves. Although the exact cause of the Bell's Palsy undetermined, several factors, including excessive use of air conditioning or fans, cold weather, and the herpes virus, are often involved in cases Bell's Palsy (2).

Patients with Bell's Palsy often experience various problems, such as difficulty closing the eyes on the affected side, facial asymmetry, and difficulty eating, drinking, and speaking.

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

In addition, psychological problems related to facial appearance are also a major concern during each phase of the disease. Functional disorders on the face can cause a decrease in the patient's confidence in social interaction, which has the potential to create social disparities in society, so it is a reason to choose this case as the focus of the research (3).

Bell's Palsy It has an annual incidence rate of 15 to 20 cases per 100,000 population, with about 40,000 new cases reported each year. The cure rate for this condition ranges from 8% to 12%, and even without treatment, as many as 70% of patients can recover completely (4).

Case Bell's Palsy many occurred in Indonesia. Prevalence of occurrence Bell's Palsy in Indonesia at 19.55% in 2020, this case can affect all ages from toddlers to the elderly. It usually hits only one side and can be repeated (5).

The role of physiotherapy in the treatment of Bell's Palsy Including pain reduction, restoration of impaired functions, and handling problems that arise due to these conditions. In an effort to overcome this problem, namely in patients with a swollen face to one side in this case on the right side, physiotherapy intervention can be carried out through several methods, including giving Infra Red which aims to reduce pain and improve blood circulation. In addition, the use of Electrical Stimulation It aims to provide motor stimulation to nerves and muscle tissues. Massage techniques (Massage) is also applied to increase the strength of facial muscles as well as maintain muscle physiology. Based on the description above, the author is interested in taking the case of "Management of Physiotherapy in Bell's Palsy Dextra with Infra Red, Electrical Stimulationand Massage" (6).

Physiological Anatomy

Anatomy is a discipline that studies the structure of the human body, both internally (Internal) and the outside (External), as well as the physical relationships between the various components of the body. Meanwhile, physiology is the science that studies the function or activity of each body tissue and parts of the organ system, as well as the role of each in the overall function of the body (12).

Facial muscular system

The facial mimicry muscles are located inside the superficial fascia of the face, originate from the facial bones, and are connected to the skin of the face. Facial structures such as the orbit, nose, and mouth are protected by the eyelids, nasal lobes, and lips. The main function of mimic muscles is to close (Sphincter) and open (Dilator) structures. In addition, mimic muscles also play a role in the formation of facial expressions. All of these muscles receive blood supply from the facial arteries (13).

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

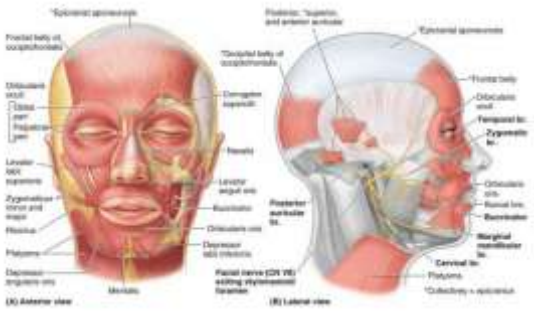


Figure 2. 1 Anatomy of facial muscles

Facial Nerves

The muscles of the face include mimic muscles, fully of which are innervated by nerves Cranial Seventh, namely the nerves facialis. These nerves come out of the posterior cranii fossa through Meatus acusticus internus. Then this nerve runs in the bones Temporal and took out some branches and walked out through Foramen stylomastoideus. Further nerves facialis will travel to the inner surface of the gland parotis, then divided into two parts, namely Temporofacial Division (top face) and Cervicofacial Division (used for the lower face). The two divisions will issue five branches (Ramus) which will innervate the muscles of the face, namely Temporal Ramus, Zygomatical Ramus, Buccal Ramus, Mandibular Marginal Ramusand Cervical Ramus. The muscles of the smile component get innervation from Ramus zygomatical (innervating the area under the eyes, the area on the lateral of the nose, and the upper lip) and Buccal Ramus (innervate the front of the gland parotis, cheek muscles, upper lip, and corner of the mouth) (15).

According to Mujaddidah, in 2017 the facialis nerve has five important branches, namely (16) :

a. The superficial petrosus nerve major exits the geniculi ganglion. This nerve has a parasympathetic preganglionic branch that gives synapses to the pterygopalatine ganglion. These nerve fibers provide seromotor branching in the lacrimal glands and glands in the nose and palate. This nerve also contains afferent fibers obtained from the taste bud of the palatal mucosa.
b. The stapedius nerve, innervates the stapedius musculosis in the middle ear.
c. The tympanic cord is located in the facialis canal on the posterior wall of the tympanic cavum. This part of the nerve goes directly to the medial surface of the upper part of the tympanic membrane and leaves the middle ear through the petrotympanic fissure and enters the infratemporal fossa and joins the lingualis nerve. The tympanic cord has parasympathetic preganglionic fibers in the form of secretomotor fibers that innervate the submandibular and sublingual salivary glands. The tympanic cord also has taste bud nerve fibers from the anterior 2/3 of the tongue and the base of the mouth.
d. The posterior auricular nerve gives innervation of the auricular and temporal muscles.

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

There is also a muscular branch that exits after the nerve exits the stylomastoideus foramen. This branch provides innervation to the stylohyoid musculus and the posterior digastricus musculos.

e. Five terminal branches for mimic muscles. The branches are the temporal branch, the zygomatic branch, the buccal branch, the mandibular branch and the cervical branch.

Face Comparison

The image on the left shows that the face looks symmetrical, without any downward slope on one side of the face, and there is no difficulty when smiling. In addition, there is no visible decrease in one of the eyes and eyebrows. On the other hand, in the image on the right, the face shows asymmetry, with a decrease on one side of the face towards the bottom, difficulty smiling, and a visible decrease in one eye and eyebrows (17).

Figure 2. 2 Comparison of normal and abnormal faces on bell's palsy face (6)

Biomechanics

Biomechanics relevant to the case of Bell's Palsy include movement in the temporomandibular (TMJ) joint, which has the basic function of opening and closing the jaw. This function is commonly used in speaking, eating, and drinking activities. The normal movement for opening the jaw ranges from 35-40 mm, which is equivalent to a distance of 2-3 fingers between the upper and lower incisors. In addition, the protrusion movement is about 3-7 mm, while the lateral deviation ranges from 5-12 mm (18).

The following is a description of the biomechanics of the temporo mandibular joint and its driving muscles:

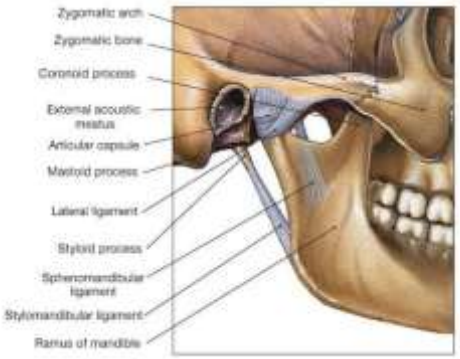


Figure 2. 3 Biomechanical temporomandibular joint

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

When the jaw closes, the masseter muscles play a role by attaching to the Origo Pars superfisialis at Margo inferior Arcus zygomatici (tendon) and ends in Pars superficialis at Angulus Mandibula (Masseteric tuberosite) and on Deep Pars at Margo inferior mandibulae. Main functions of muscles Mass is to cover the jaw, while Pars superficialis helps encourage Mandibular forward (Protrusion). In addition to muscles Massmuscle Pterygoideus medialis also contributes to closing the jaw with attraction Mandibular forward (Protrusion). This muscle attaches to the origo at Fossa pterygoidea and ends in Margo inferior mandibulae (Pterygoidea tuberosite). Muscle Temporalis It also plays a role in closing the jaw and is the most powerful chewing muscle. This muscle attaches to the origo at Temporal os under Inferior temporal line and on the inner layer Fasia temporaliswith insert at mandibular coronoid process. Part Anterior These muscles help push Mandibular forward (Protrusion), while the posterior pull Mandibular backwards (retrusive) For the movement of opening the mouth, the muscles Pterygoideus lateralis role, with origo at Superior capus at Crista infra. Muscle Pterygoideus lateralis It has two parts: Superior capus that attaches to Temporalis ossis sphenoidalis and Caput Inferius that attaches to Lamina lateralis process pterygoidei. Superior caput ends on discus and capsules Articulatio temporomandibularisWhile Caput Inferius ends on Process condylaris mandibulae (Fovea pterygoidea). Superior caput Function of starting the jaw opening by pulling Discus articulalis forward (Protrusion), while Caput Inferius pull Mandibular forward (Protrusion). Movement Unilateral from these muscles produce Excursion Contra Lateral. Muscle Pterygoideus lateralis works with muscles Mylogyoideus, which attaches to Origo linea mylohyoidea mandibulae and ends in Raphe mylohyoidea corpus ossis hyoidei. This muscle helps to open the mouth, lower Mandibular, as well as lifting Os hyoideum when swallowing. In addition, the muscles Digastricus also plays a role in helping muscle function Mylogyoideus. This muscle attaches to the origo at Mastoid incisura ossis temporalis and ends in Fossa digastrica mandibulae (19).

METHODS

The anamnesis which was carried out on February 7, 2025 obtained the results that the patient with the name of Mr. K was 17 years old who lived in Pingit, Pringsurat, Temanggung. Brother K is a Muslim female student. The patient complained of a feeling like a thick sensation on the right side of his face, when smiling he would droop to the left side of the face, unable to close the eyelids on the right side of the face completely after previously the patient often slept on the cold floor for a long time and repeatedly. The patient also has difficulty when eating and drinking because food will collect on the right side and also when drinking water is felt to leak to the right side. In January 2025, the patient checked his complaint to the Medical Rehab Doctor of RSJ Prof. Dr. Soerojo Magelang from the results of the patient's examination and was referred to Medical Rehab for Physiotherapy. Physiotherapy has been carried out for 1 month by RSJ Physiotherapist Prof. Dr. Soerojo Magelang, then continued therapy 1 month after that and the patient has felt pain gradually reduced, but the patient still feels stiffness on the right side of the face.

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

RESULTS AND DISCUSSION

A 17-year-old female patient with Bell's Palsy Dextra has the main complaints, namely swollen lips to the left side, food collected to the right side when eating, and when gargling or drinking leaks on the right side. Based on these complaints, physiotherapy problems were found, including facial asymmetry due to weakness of the facial muscles on the right side, facial expression disorders such as not being able to close the eyes tightly, not being able to raise eyebrows, and when whistling and smiling asymmetrically. After therapy, patients felt a decrease in pressure pain in the facial muscles, an increase in the strength of the right side facial muscles, and an improvement in functional ability to perform facial expressions. The results of the evaluation of therapy management starting from T1 to T4 are as follows:

Management of physiotherapy with Infra Red and Electrical Stimulation

Use Infra Red in case Bell's Palsy It can help improve blood circulation, speed up the tissue healing process, and reduce pain in the affected area of the face. This is in accordance with the explanation by Pratama et al. (2021) in his article "Therapeutic Effectiveness Infrared on Patients Bell's Palsy", which states that the therapy Infra Red provides a local vasodilating effect, improves tissue metabolism, and helps reduce muscle spasms and pain through a superficial warming effect (47).

In addition, the modalities Electrical Stimulation (ES) is also widely used in cases Bell's Palsy to stimulate the contraction of facial muscles that are weakened due to facial nerve disorders. According to research by Sari & Nugroho (2020) in "Electrical Stimulation on Rehabilitation Bell's Palsy", the administration of electrical stimulation plays a role in improving neuromuscular function, preventing muscle atrophy, and increasing the strength of facial muscles through direct activation of motor nerves (48).

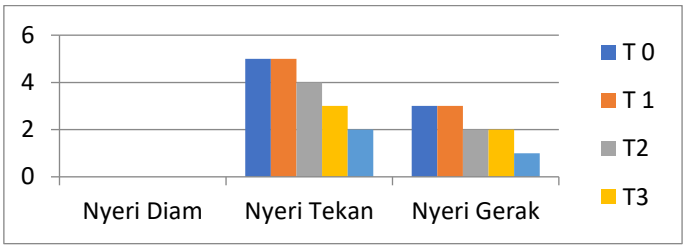
The effectiveness of these two modalities is also supported by Literature Review done by Rahmawati et al. (2022), which concluded that the combination of Infra Red and Electrical Stimulation It can significantly accelerate the recovery of facial muscle function, reduce pain, and improve facial expression in patients Bell's Palsy, compared to conventional therapy alone. In the case of patients Bell's Palsy Dextra 17 years old who was the subject of the study, the management of physiotherapy was carried out by giving Infra Red and Electrical Stimulation for four therapy sessions. The results of the evaluation showed a significant increase in facial muscle strength and a decrease in pressure pain (49).

Based on the results of the Manual Muscle Testing (MMT) measurement, the strength of the right side facial muscles increased from an initial value of 2 to 4 after four rounds of therapy. Meanwhile, the Visual Analogue Scale (VAS) score for compressive pain in the facial muscles decreased from 5 to 2, indicating a significant decrease in pain. In addition, the facial expression function also showed improvements based on the increase in Ugo Fisch's score from 36 to 53. The reduction of pain and improvement of facial muscle function in Bell's Palsy patients is not only influenced by the modality given, but also by other factors such as the severity of the nerve lesion, the patient's age, motivation, and adherence to therapy. However, based on the results of the therapy evaluation in this case,

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

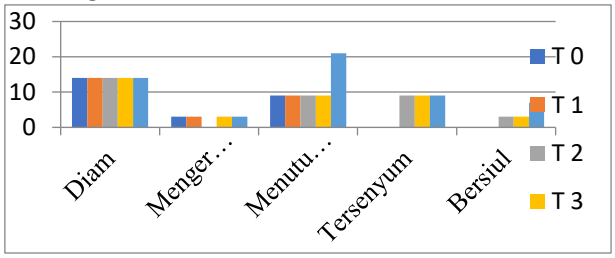
the combination of Infrared Red and Electrical Stimulation has been proven to provide very effective results in accelerating the rehabilitation process and improving the patient's quality of life.

The administration of Infra Red and Electrical Stimulation to Mr. K patients resulted in a reduction in pressure pain in patients who were T1 5 to T4 2. As for motion pain from T1 3 to T4 1. Then for silent pain T1- T4 with a value of 0. The following is a graph of pain reduction which can be seen below:



Graph 4. 1 Pain Reduction with VAS

Assessment of facial muscle function in Bell's Palsy patients was carried out using the Ugo Fisch scale to assess facial expression abilities, such as frowning, closing eyes, smiling, and whistling. Based on the results of the examination on T0 therapy, the patient's Ugo Fisch score showed an initial score of 26. After managing physiotherapy with Infra Red and Electrical Stimulation for four rounds of therapy, at the T4 meeting Ugo Fisch's score increased to 54. These results showed a significant improvement in facial muscle function, where patients were able to perform facial expression movements better than before therapy. The following is a graph of Ugo Fisch's score increase:



Graph 4. 2 Ugo fisch Scale Increase

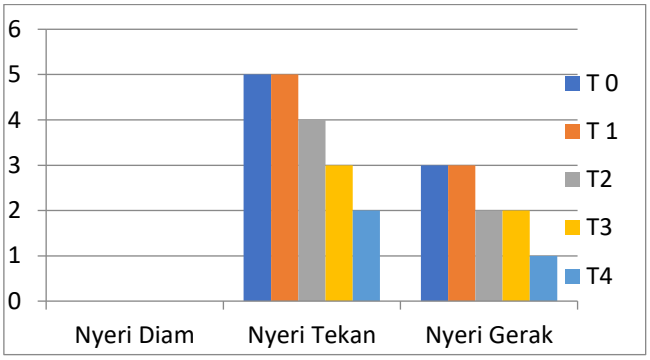
Management of physiotherapy with Massage Therapy

Therapeutic use Massage in case Bell's Palsy It can help improve blood circulation, reduce pain, improve muscle tone, and accelerate the recovery of facial muscle function. This is in accordance with the explanation by Prasetyo (2021) who states that massage on the face can increase local blood flow, help reduce muscle spasms, and improve tissue elasticity so that it can speed up the healing process and prevent muscle atrophy in Bell's Palsy patients (50).

The effectiveness of massage is also supported by research conducted by Rahayu et al. (2022), which states that regular massage of the patient's facial muscles Bell's Palsy It can reduce pain levels, increase muscle strength, and improve facial expression function. Massage provides a relaxing effect on tense muscles and helps reduce edema that may arise due to impaired circulation in the affected area of the face (51).

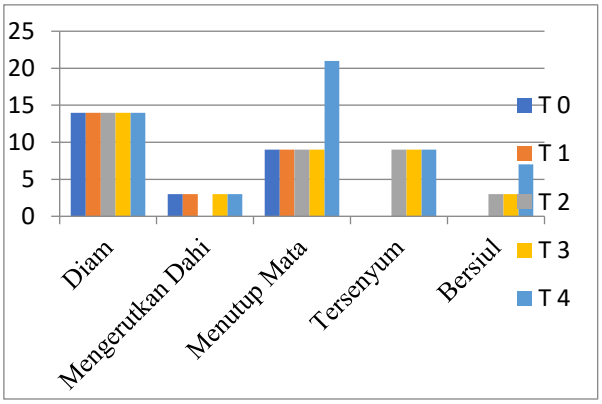
Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

The administration of Massage Therapy to Mr. K's patients resulted in a decrease in pressure pain in patients who were T1 5 to T4 2. As for motion pain from T1 3 to T4 1. Then for silent pain T1- T4 with a value of 0. The following is a graph of pain reduction which can be seen below:



Graph 4. 3 Evaluation of pain measurement with VAS

Assessment of facial muscle function in Bell's Palsy patients was carried out using the Ugo Fisch scale to assess facial expression abilities, such as frowning, closing eyes, smiling, and whistling. Based on the results of the examination on T0 therapy, the patient's Ugo Fisch score showed an initial score of 26. After physiotherapy management with Massage Therapy for four times of therapy, at the T4 meeting Ugo Fisch's score increased to 54. These results showed a significant improvement in facial muscle function, where patients were able to perform facial expression movements better than before therapy. The following is a graph of Ugo Fisch's score increase:



Graph 4. 4 Ugo Fisch's Scale Upgrade

Management of physiotherapy with Infra Red and Electrical Stimulation

Use Infra Red in case Bell's Palsy It can help improve blood circulation, speed up the tissue healing process, and reduce pain in the affected area of the face. This is in accordance with the explanation by Pratama et al. (2021) in his article "Therapeutic Effectiveness Infrared on Patients Bell's Palsy", which states that the therapy Infra Red provides a local vasodilating effect, improves tissue metabolism, and helps reduce muscle spasms and pain through a superficial warming effect (47).

In addition, the modalities Electrical Stimulation (ES) is also widely used in cases Bell's Palsy to stimulate the contraction of facial muscles that are weakened due to facial nerve

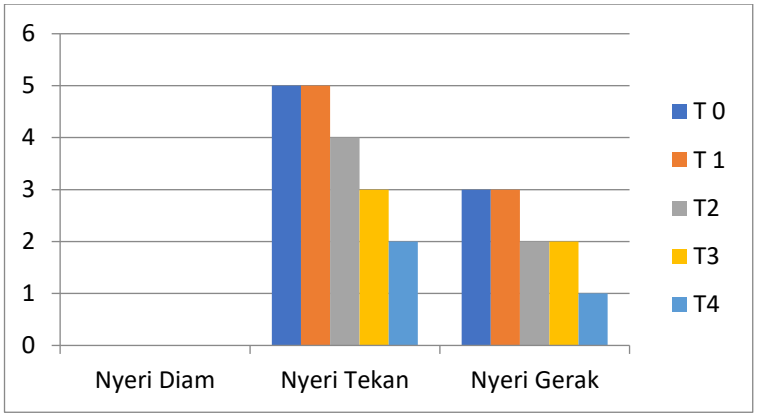
Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

disorders. According to research by Sari & Nugroho (2020) in "Electrical Stimulation on Rehabilitation Bell's Palsy", the administration of electrical stimulation plays a role in improving neuromuscular function, preventing muscle atrophy, and increasing the strength of facial muscles through direct activation of motor nerves (48).

The effectiveness of these two modalities is also supported by Literature Review done by Rahmawati et al. (2022), which concluded that the combination of Infra Red and Electrical Stimulation It can significantly accelerate the recovery of facial muscle function, reduce pain, and improve facial expression in patients Bell's Palsy, compared to conventional therapy alone. In the case of patients Bell's Palsy Dextra 17 years old who was the subject of the study, the management of physiotherapy was carried out by giving Infra Red and Electrical Stimulation for four therapy sessions. The results of the evaluation showed a significant increase in facial muscle strength and a decrease in pressure pain (49).

Based on the results of the Manual Muscle Testing (MMT) measurement, the strength of the right side facial muscles increased from an initial value of 2 to 4 after four rounds of therapy. Meanwhile, the Visual Analogue Scale (VAS) score for compressive pain in the facial muscles decreased from 5 to 2, indicating a significant decrease in pain. In addition, the facial expression function also showed improvements based on the increase in Ugo Fisch's score from 36 to 53. The reduction of pain and improvement of facial muscle function in Bell's Palsy patients is not only influenced by the modality given, but also by other factors such as the severity of the nerve lesion, the patient's age, motivation, and adherence to therapy. However, based on the results of the therapy evaluation in this case, the combination of Infrared Red and Electrical Stimulation has been proven to provide very effective results in accelerating the rehabilitation process and improving the patient's quality of life.

The administration of Infra Red and Electrical Stimulation to Mr. K patients resulted in a reduction in pressure pain in patients who were T1 5 to T4 2. As for motion pain from T1 3 to T4 1. Then for silent pain T1- T4 with a value of 0. The following is a graph of pain reduction which can be seen below:



Graph 4. 5 Pain Reduction with VAS

Management of physiotherapy with Massage Therapy

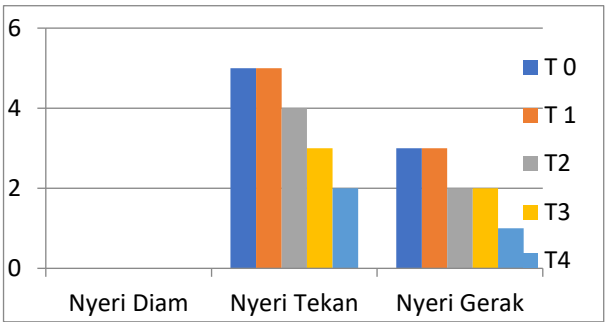
Therapeutic use Massage in case Bell's Palsy It can help improve blood circulation, reduce pain, improve muscle tone, and accelerate the recovery of facial muscle function. This

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

is in accordance with the explanation by Prasetyo (2021) who states that massage on the face can increase local blood flow, help reduce muscle spasms, and improve tissue elasticity so that it can speed up the healing process and prevent muscle atrophy in Bell's Palsy patients (50).

The effectiveness of massage is also supported by research conducted by Rahayu et al. (2022), which states that regular massage of the patient's facial muscles Bell's Palsy It can reduce pain levels, increase muscle strength, and improve facial expression function. Massage provides a relaxing effect on tense muscles and helps reduce edema that may arise due to impaired circulation in the affected area of the face (51).

The administration of Massage Therapy to Mr. K's patients resulted in a decrease in pressure pain in patients who were T1 5 to T4 2. As for motion pain from T1 3 to T4 1. Then for silent pain T1- T4 with a value of 0. The following is a graph of pain reduction which can be seen below:



Graph 4. 6 Evaluation of pain measurement with VAS

CONCLUSION

The management of physiotherapy in the case of Bell's Palsy Dextra using Infra Red, Electrical Stimulation, and Massage modalities has been carried out in accordance with the Standard Operating Procedures (SOP). The results obtained showed improvements, including wrinkles on the forehead that began to be visible, the patient's ability to close the eyes tightly, better symmetry when smiling in the lip area, increased facial muscle strength, and decreased pressure pain behind the ear. For Physiotherapy, Physiotherapists in providing services must follow the standard operating procedures that have been set before taking action on patients. Physiotherapists need to conduct a thorough and systematic examination to be able to identify the patient's problems in detail. Therefore, the expansion of knowledge and understanding that is appropriate to the patient's condition is essential, as well as the utilization of relevant science and technology. It is hoped that in the future, physiotherapists will be better able to choose the right intervention technology according to the problems faced by the patient, so that the desired results can be achieved. In addition, collaboration with other medical teams is also important to achieve the expected goals. For Patients; Patients are required to undergo therapy regularly in order to achieve optimal therapy results. Every day, it is recommended to carry out a training program at home, such as practicing in front of a mirror with closed movements, raising eyebrows, and whistling. In addition, the education provided by physiotherapists includes facial compression on the sore side with warm water,

the use of a full face helmet when riding a motorcycle, the wearing of a mask when leaving the house, and doing facial massage with light pressure towards the ear. Patients are also advised to avoid outdoor activities at night or exposure to cold air. Patients are encouraged to model exercises in front of a mirror, where the physiotherapist gives demonstrations. The patient is asked to frown, while the area with the lesion is lifted with the help of the hand from the healthy side. When smiling, the area with the lesion is pulled upwards using the patient's hand. For Families, Always providing consistent motivation and support to the patient during therapy is essential, as this can speed up the healing process.

REFERENCES

1. Fidela Anindya Atha, Ratna Dewi Puspitasari, Ramadhana Komala. Bell's Palsy : A Literature Review. Detect J Inov Ris Health Sciences [Internet]. 2025 Feb 13; 3(1):62–8.
2. Ika Rahman, Anggi Agustini. Physiotherapy management in the case of Bell's Palsy Dekstra with Electrical Stimulation (Faradik), Massage and Exercise Therapy modalities. Health Info. 2023; 6(2):16–33.
3. Putri ZR. Bell's Palsy: Diagnosis and Management. Mirror of the Medical World. 2022; 49(8):431–4.
4. Marc H. Hohman; Matthew J. Warner; Matthew A. Varacallo. StatPearls [Internet]. Bell Palsy.
5. Hargiani FX. Application of Neuromuscular Taping of Bell's Palsy Case in Physiotherapy Practice Experience at Kineta Sidoarjo Clinic. J Ilm Physiotherapist. 2019; 2(1):10–4.
6. Jannah, Miftahul and AS. Improving Facial Functional Ability with Electrical Stimulation and Massage in Bell's Palsy Patients at PKU Muhammadiyah Hospital Bantul. 2022; 20(1):105–23.
7. Permenkes. Regulation of the Minister of Health of the Republic of Indonesia. 2015.
8. Maulidia Khairunissa A, Eko Budi Prasetyo Physiotherapy Study Program and, Health Sciences f. Management of physiotherapy in the condition of "total hip replacement" with infrared capital and exercise therapy at orthopedic hospital dr. R. Soeharso Surakarta. Vol. 34. 2020.
9. Shamsi S. Effect of Physiotherapy in the Management of Facial Palsy-Case Study. Int J Heal Sci Res [Internet]. 2015; 5(January):408.
10. Lokawati M. Management of physiotherapy in Bell's palsy sinistra with infra red, massage, and mirrorx exercise modalities at Salatiga City Hospital. 2018; 1–10.
11. Rachmat AA, Naufal AF, Science F, Program K, Profession S, University F, et al. Physiotherapy management in the case of bell 's palsy sinistra at RSJD dr RM Soedjarwadi Klaten : Case. 2020;
12. Sari MJA. Learning Module of Human Body Physiology Anatomy and Semester Learning Plan (RPS) of Biology Education. Raden Intan State Islamic University Lampung [Internet]. 2021;157.
13. Mujaddidah N. Clinical Anatomy Review and Management of Bell's Palsy. Vol. 1, Qanun Medika - Medical Journal Faculty of Medicine Muhammadiyah Surabaya. 2017.

14. Ummah MS. Anatomy of Facial Muscles [Internet]. Vol. 11, Sustainability (Switzerland). Consider using the 2019 Draft Rules, 1–14 pp.
15. Nurjanah S, Novia W, Putri TAK, Smith S, Dewi NMS, Azmi U, et al. Facial Palsy Treatment After Cranial Base Fracture : A Systematic Review. J Biol Trop. 2023; 23(4):582–93.
16. Yanuar AS. Expert system of anamnesis of neurological diseases based on symptoms using the certainty factor method. J Univ Islam Indonesia. 2018;
17. Soeselo Tegal Hospital. Is Bell's Palsy the same as a stroke? [Internet]. 2022.
18. Lu J, Yin Z, Qiu Y, Yang Y, Chen Z, Wu J, et al. Exploring the Role of Inflammation and Metabolites in Bell's Palsy and Potential Treatment Strategies. Biomedicines. 2025; 13(4):1–14.
19. Parapat RY, Sandjaya E, Nurfadhilah SA, Fetok MM, Hikmah N, Salafffudin. Scientica Scientica. Eval worked at PT Timah Ind using the HIRARC method. 2024; 2:251–5.
20. And Thoifur. Chapter II Bibliography 2.1 Anatomy 2.1.1 Nervous Facialis. 2021.
21. Yuliani PS. Characteristics of Bell's Palsy Patients at Wahidin Sudirohusodo Hospital Makassar. Fak Kedokt Univ Hasanuddin. 2022; 5(3):248–53.
22. Sumandjar T, Adnan ZA, Kartodarsono S, Pramana. Stasis Learning Module of Disease Sciences in the Medical Profession Study Program. Fak Kedokt Univ Sebel March. 2020;
23. Abubakar M, Laksmita DY. Masriaaaaa Publication Manuscript - Masria Abubakar. 2021;
24. Mahardani O. Bell ' s Palsy Bell ' s Palsy. J Ilm Kedokt Wijaya Kusuma [Internet]. 2019; 8(1):137–49.
25. Rakasiwi, Maheswara A, Rini MP. Management of physiotherapy in the condition of Torticollis sinistra et causa Bell's palsy congenital dextra with infrared modalities, massage and exercise therapy at YPAC Prof. DR. Soeharsono Surakarta. Faculty of Health Sciences Ums. 2023; 19(11):1649–54.
26. Lilianti V, Priskila O. Handling a Case Study of Bell's Palsy Using Acupuncture. J Ilm Horizon. 2024; 3(12):3405–13.
27. Nurkholbiah C, Halimah E. Therapy for Bell's Palsy Based on Severity. Pharmacy. 2016; 14(2):41–9.
28. Just. Low back pain: What every person should know. Neurologist. 2019; 5(5):291–2.
29. Febriyanti RIM, Sugiarti I. Analysis of the Completeness of Anamnesis Form Data Filling and Physical Examination of Surgical Cases. J Manaj Inf Kesehat Indonesia. 2015; 3(1):31–7.
30. Health Sciences f. Management of physiotherapy in trigger finger conditions at Sragen Hospital Submitted to Complete the Requirements for Completing the Diploma III Physiotherapy Study Program in the Physiotherapy Study Program. 2012;
31. Zalfa F, Santoso TB, Fauzan M. Improving muscle strength and function in cases of bell's palsy : a case report. :39–48.
32. Rachmat AA, Naufal AF, Science F, Program K, Profession S, University F, et al. Physiotherapy management in the case of bell 's palsy sinistra at RSJD dr RM Soedjarwadi Klaten : Case. 2018; 1–8.

33. Rakasiwi MA, Rini PM. Management of physiotherapy in the condition of Torticollis sinistra et causa Bell's palsy congenital dextra with infrared modalities, massage and exercise therapy at Ypac Prof. Dr. Soeharso Surakarta. JarFisMU. 2023; 3(1):1–9.
34. Safitri PA, Rakasiswi MA. Management of Physiotherapy in the Condition of Bell's Palsy Sinistra with Infrared Modality, Electrical Stimulation of Faradik Current and Exercise Therapy at Bendan Hospital, Pekalongan City. J Health Sciences Group [Internet]. 2022; 2(1):199–206.
35. Practice is beautiful. Abstract Introduction. Bell's Palsy is paralysis on. 2021; 3:103–10.
36. Octaviany DL, Pledge of Allegiance. Management of physiotherapy in the condition of low back pain e.c spondylosis with the modality of transcutaneous electrical nerve stimulation (tens) and back exercise at Orthopedic Hospital Prof. Dr. R. Soeharso Surakarta. [Internet]. 2019; 33(1):1–14.
37. Rahman DA, Rahman I. Physiotherapy management in cases of bell's palsy sinistra with infra red, electrical stimulation and massage physiotherapy management in cases of bell's palsy sinistra with infra red, electrical stimulation and massage modalities. Andalas Medica. 2024; 55(4):524–30.
38. DI Village, Regency B, Sulawesi B. Counseling and provision of infrared therapy. 2024; 5(2):1–9.
39. Main FDY. Management of physiotherapy in Total Knee Replacement et Causa Osteoarthritis Sinistra with Infra Red, Transcutaneous Electrical Nerve Stimulation and Exercise Therapy. 2022;
40. Binawan University. Physiotherapy-2021-LISNA florentina sidauruk.pdf.
41. Amin R, Zaidah L. The Effect of Electrical Stimulation and Massage to Increase Muscle Strength in Patients with Bell's Palsy: Narrative Review. Occupy Med (Chic Ill). 2021; 53(4):130.
42. Wea G, Greece. Management of Physiotherapy in Bell's Palsy Sinistra Cases with Electrical Stimulation, Massage and Miror Exercise Modalities at Cililin Hospital. JPhiS (Journal of Student Physiotherapy). 2022; Vol 1 No 2:91–101.
43. Selviyani J, Kuswardani. Case Study: Management of Physiotherapy in Bell's Palsy with Electrical Stimulation and Massage. Indonesia J Heal Res Innov [Internet]. 2024; 1(2):72–6.
44. Sania Indah Pratiwi, Karlina, Ika Rahman, Piksi Ganesha Polytechnic. Management of physiotherapy in cases of bell's palsy sinistra with infrared modalities, electrical stimulation (faradik) and massage at Cililin Hospital. 2021; Volume 3:1–8.
45. Abidin Z, Dicky Haryanto and. The effect of infra red, massage and mirror exercise effect in bell's palsy infra red, massage and mirror exercise effect in bell's palsy. J Physiotherapist and Rehab. 2017; 1(2).
46. JWH beads. Practicum module on physiotherapy management in neuromuscular disorders. 2021; 0–47.
47. Ali NWW, Halimah N, Kasimbara RP, , S. The Effect of Infrared (IR) and Mirror Exercise on Increasing Muscle Strength and Functional Ability in Bell's Palsy Cases. J Mesencephalon Health. 2024; 10(1):56–60.

48. Ng SY, Chu MHE. J Chiropr Med. 2024. Treatment of Bell's Palsy Using Monochromatic Infrared Energy: A Report of 2 Cases.
49. Afandi GE, Rahman I. Management of Physiotherapy in the Case of Bell's Palsy Sinistra with Infrared and Massage Modalities at Cikalong Wetan Hospital, West Bandung Regency. Exellent Midwifery J. 2021; 4(2):44–9.
50. Widya A, Revelation St. Physiotherapy Management in Bell's Palsy Case With Electrical Stimulation and Massage Modalities: a Case Report. Acad Physiother Conf J [Internet]. 2021; 403–12.
51. Abidin Z, Amin AA, Purnomo D. Effect of Infra Red and Massage on Bell's Palsy Dextra. J Physiotherapist and Rehab. 2017; 1(1):41–8.