



## Original Article

### Effectiveness of functional training in improving function of facial muscles in people with facial palsy due to trauma

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#### Abstract

**Background:** This study aimed to examine the effects of a functional training in improving function of facial muscles in people with facial palsy due to trauma.

**Settings and Design:** Saveetha Physiotherapy OPD, Two group pre-test post-test non-equivalent design.

**Methods:** 20 participants based on convenient sampling were assigned to either receive Functional training group or conventional treatment group. The primary outcome measures are House Brackman score and facial disability index (FDI).

Statistical analysis used: Mann Whitney U test was used to compare the data sets between the groups.

**Results:** Between group analysis of post-test mean and standard deviation for House-Brackman score for Functional training group and conventional treatment were 1.6(1) and 3.67(0.72) respectively. It was statistically significant with  $p < 0.05$ . Between group analysis for FDI were statistically significant with  $p = 0.01$  at the end of 4 weeks for both subscales of physical and social.

**Conclusions:** Functional training may improve function of facial muscles and can be recommended for people affected with facial palsy due to trauma.

**Keywords:** functional training, traumatic facial palsy, facial exercises, recovery of function, facial rehabilitation, FDI, House-Brackman, Task training.

#### Introduction

Functional training aims to incorporate the primary movement functions of the face, including expression of emotions and other motor functions, into the patient's everyday activities. In real-life situations, humans express spontaneous emotions with rapid variations. Emotions are significantly influenced by the context, such that in some situations a person may feel a mixture of emotions with varying intensity, which they try to hide, alter, or dampen to influence the viewer's

perception. This requires articulation of both unconstrained and purposeful feelings, which include various mixes of muscle activities that can't be effectively duplicated by enacting them outside of the specific circumstance. Therefore, the exercise training included activities like watching films, TV programs or comical recordings and requesting that the patient describe them to the physiotherapist and focus on encouraging expression of emotions in a real life context.<sup>1,8,16</sup> Treatment was provided in a closed and isolated room to avoid outside interruptions during the conversation and to provide adequate privacy to alleviate any inhibition. The treating physical therapist provides 20-30 minute sessions with the patient, once a day, 5 days/week over 4 weeks.

**Conventional exercise:** We adopted the treatment suggestions given by Vanswearingen et al.<sup>17</sup> Facial expressions in front of mirror such as raise the eyebrows, flaring the nose, closure of the eyes and blowing. The patient will be asked to perform each exercise 5-10 times, three times a day (once in the

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clinic and twice at home) for 5 days a week over 4 weeks. Exercise done at home will be confirmed by a phone call thrice a day and exercise compliance will be noted in a handbook provided.

**Outcome Measure**

**House-Brackman Facial Grading System**

The House-Brackman Facial Grading System consists of six grades, where Grade 1 represents normal function and Grade VI represents total paralysis. It is one of the most widely used scales and has been shown to have good inter-rater reliability.

**Facial Disability Index**

The FDI is a 10-item questionnaire with 2 subscale scores: 5 items contribute to the physical function subscale, and 5 items contribute to the social/well-being function subscale. The physical function subscale investigates problems in eating, drinking, speaking, lacrimation, and oral hygiene. The social/well-being function subscale investigates subjective perception of anxiety, irritation, and isolation; problems in sleeping; and limitations in social participation. Each item is rated on a 6-point scale, ranging from severe disability to absence of disability. Both subscales are transformed to a score on a 100- point scale, with 100 indicating unimpaired physical or social/wellbeing function.

**Statistical Analysis**

The data were statistically analysed using descriptive and inferential statistics; mean and standard deviation were estimated using Wilcoxon signed rank test and Mann Whitney U test. Wilcoxon signed

rank test were used to compare data sets within the groups and Mann Whitney U test were used to compare between the groups.

**Result**

In the present study, 10 participants from the functional training group with mean age of 40.5 (10.9) years and 10 participants from the conventional group with mean age of 36.5(10.1) years completed the study duration of 4 weeks. Table 1 shows the two groups were the same in terms of baseline variables. Table 2 shows the results from Mann Whitney U test and Wilcoxon signed rank test. House brackmann score of pre-test and post-test mean and standard deviation of functional training group were 4.26(0.45) and 1.6(1) respectively. The pre-test and post-test mean and standard deviation of conventional group were 4.4(0.63) and 3.67(0.72) respectively. Within group analysis of pre-test and post-test results of was significant with  $p < 0.001$  and  $p = 0.04$  respectively. Between group analysis of post-test House Brackman score was statistically significant with  $p = 0.04$ .

The pretest and posttest mean and standard deviation of FDI-Physical function of group A and group B were 46.33(4) and 88(2.4) with  $p < 0.0001$  & 42.4(3.5) and 52.4(3.8) with  $p = 0.0391$  respectively. Between group analysis of posttest values of FDI-physical function score of group A and group B shows that there was significant difference between the group with  $p = 0.01$ . The pretest and posttest mean and standard deviation of FDI-Social function scores of Group A and Group B were 32.4(3.5) and 92(3) & 36.4 (2) with  $p < 0.04$  and 51.4(9.8) with  $p < 0.05$  respectively (Table-3).

**Table 1: Baseline characteristics of studied patients who completed 4 week intervention.**

Variables	Functional Training Group	Conventional Exercise Group
Age, Years-Mean (SD)	40.5(10.9)	36.5(10.1)
Gender, n	7-Male, 3-Female	8-Male, 2-Female
Smoking, n		
Yes	4	5
No	6	5
Diabetes Mellitus, n	3	2
Traumatic cause, n:		
1. Facial injury involving fracture of temporal bone	7	8
2. Parotidectomy	1	0
3. Post dental procedure	2	2
House Brackman score, mean (SD)	4.30(0.43)	4.45(0.65)

Figure 1: Study flowchart

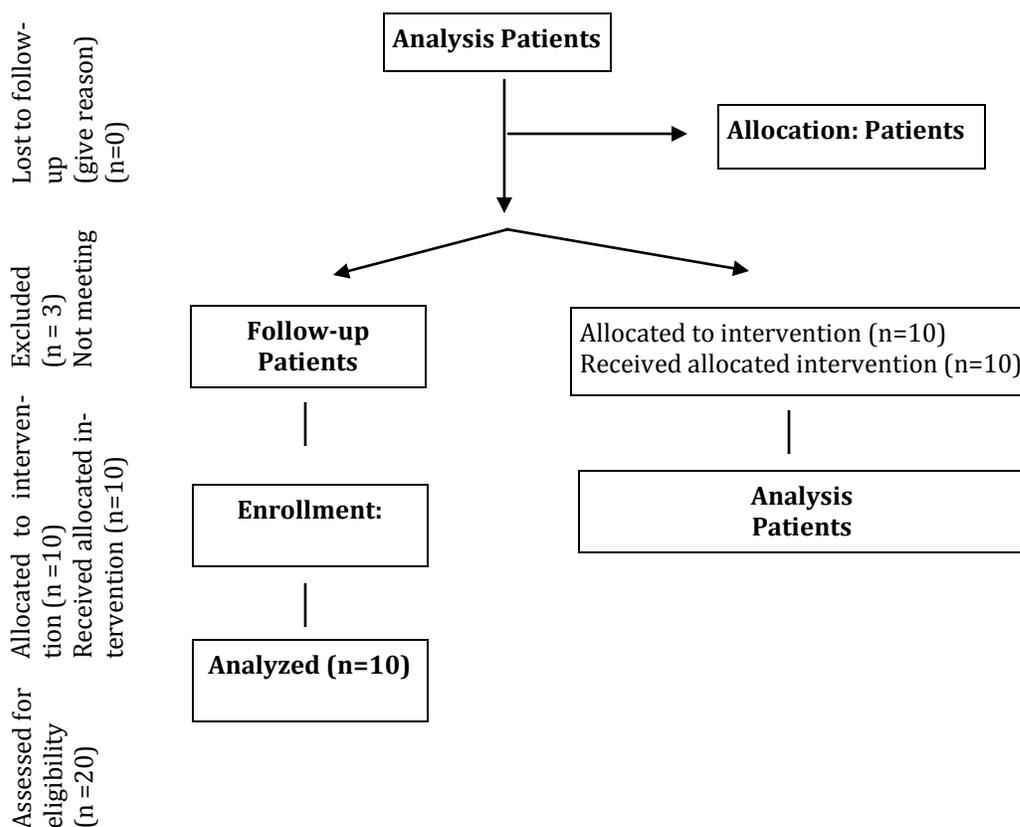


Table:2 Within and between group analysis for House Brackman score

	Functional Training Group			Conventional Care			Between Group P-Value
	Pre	Post	P-value<0.001	Pre	Post	P-value0.04	
House Brackman Score	4.30(0.43)	1.8(1)			4.45(0.65)		3.70(0.62)

Table:3 Within and between group analysis for FDI

	Functional Training Group			Conventional Care			Between Group P- value
	Pre	Post	p<0.0001	Pre	Post	P=0.0391	
FDI-Physical	46.33(4)	88(2.4)			42.4(3.2)		52.4(3.83)
FDI-Social function	32.43(3.5)	92(3.4)	P<0.04	36.4(2)	51.4(3.3)	P=0.035	p=0.01

## Discussion

The primary objective of this study was to decide if functional training would improve physical functioning of facial muscles in patients with facial paralysis of traumatic cause. The outcome supports the hypothesis that functional training program considerably improves the facial capacity of the patient with facial loss of motion. Following the 4-week functional training program, the exploratory gathering demonstrated huge improvement in physical, mental and social capacities influenced by the facial loss of motion.

The functional training program supports and gives more chances to communicate explicit, variable feelings within the patient's indigenous habitat and furthermore encourages other facial motor activities within the context such rinsing the mouth and letting out water. Intervention procedures such as, watching motion pictures, TV programs or humorous recordings, talking about them during treatment meetings and offering amusing episodes or jokes to companions give more chances to communicate felt feelings within a real-world context. While watching films, individuals will in general mimic as well as respond to the feelings relating to the scene being watched which may encourage spontaneous emotions. Similar findings have been reported in studies evaluating the efficacy of cognitive-behavioural therapy researching the adequacy of intellectual conduct preparing in people with facial distortion, showing positive results regarding confidence, advancement of positive adapting systems, and decrease in social uneasiness and improvement in social aptitudes.<sup>18-23</sup> Comparable discoveries have been accounted for in examines researching the viability of psychological conduct preparing in people with facial deformation, showing positive results regarding confidence, advancement of positive adapting procedures, decrease in social tension and improvement in social skills.<sup>23,24</sup> Conventional activities may likewise have added to the progressions seen in the physical capacity on FDI, for example, improved capacity to drink water and eat food without spilling, eye shutting, and so on. The long term effects of the therapy could not be defined as adequate follow up is not attained after the end of the intervention.

The limitations of the study is the allocation was not randomized and the outcome assessor, participants were not blinded from the treatment allocation. However, our study results are similar with the existing studies conducted on similar principles of treatment approach on changing the behavioural output of a person with disability.<sup>25-29</sup> Future research with rigorous methodologies can make this claim certain.

## Conclusion

This study demonstrates the efficacy of Functional training when compared to conventional training program in improving functional gain of facial movement and can be recommended as mainstay physiotherapy treatment for patients with facial palsy of traumatic cause.

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