

## Statistical methodology and results for Devin Chen

**Title:** The effect of muscle energy technique and ischemic compression in the treatment of cervicogenic headaches: combination mode versus single mode.

### Statistical methodology

IBM SPSS version 29 was used for data analysis. A p value <0.05 was considered as statistically significant. Chi square tests were used to compare categorical variables between the three treatment groups. Repeated measures ANOVA tests were used to compare outcomes over three time points within and between treatment groups. Profile plots were used to show direction and trend of treatment effects. Time effects were interpreted for the within-group effects, while Interaction effects between time and treatment groups with significance <0.05 indicated a significant between group treatment effects.

### Results

#### *Demographics by treatment group*

Forty-five participants were randomized into three groups of 15 each. Table 1 shows the demographic and background information by treatment group and overall. There was no significant difference between the groups for any of the variables. Age appeared to be younger in the IC only group but it was not statistically significant.

			group				p-value
			MET + IC	MET	IC	Total	
Age	Median (IQR)		31 (23-49)	27 (21-43)	22 (21-28)	26 (21-41.5)	0.119
gender	Male	Count	6	6	3	15	0.407
		%	40.0%	40.0%	20.0%	33.3%	
	Female	Count	9	9	12	30	
		%	60.0%	60.0%	80.0%	66.7%	
	Total	Count	15	15	15	45	
		%	100.0%	100.0%	100.0%	100.0%	
hand dominance	left	Count	3	1	1	5	0.594
		%	20.0%	6.7%	6.7%	11.1%	
	right	Count	12	14	14	40	
		%	80.0%	93.3%	93.3%	88.9%	
	Total	Count	15	15	15	45	
		%	100.0%	100.0%	100.0%	100.0%	
subjective side of headache	left	Count	5	5	7	17	0.795
		%	33.3%	33.3%	46.7%	37.8%	
	right	Count	10	10	8	28	
		%	66.7%	66.7%	53.3%	62.2%	

side of SCM with myofascial trigger point	Total	Count	15	15	15	45	0.921
		%	100.0%	100.0%	100.0%	100.0%	
	left	Count	4	5	6	15	
		%	26.7%	33.3%	40.0%	33.3%	
	right	Count	11	10	9	30	
		%	73.3%	66.7%	60.0%	66.7%	
	Total	Count	15	15	15	45	
		%	100.0%	100.0%	100.0%	100.0%	

### Research objectives

1. To determine the effectiveness of combining muscle energy technique with ischaemic compression in the treatment of cervicogenic headache in terms of subjective (disability and pain) and objective (PPT and CROM) findings.

This objective was a within-group comparison from pre to immediately after and days after intervention of the combination group.

### Left posterior to anterior

There was a highly statistically significant change over time for this outcome in this group ( $p < 0.001$ ). The plot shows it was an increase over time in all time periods.

### Multivariate Tests<sup>a,b</sup>

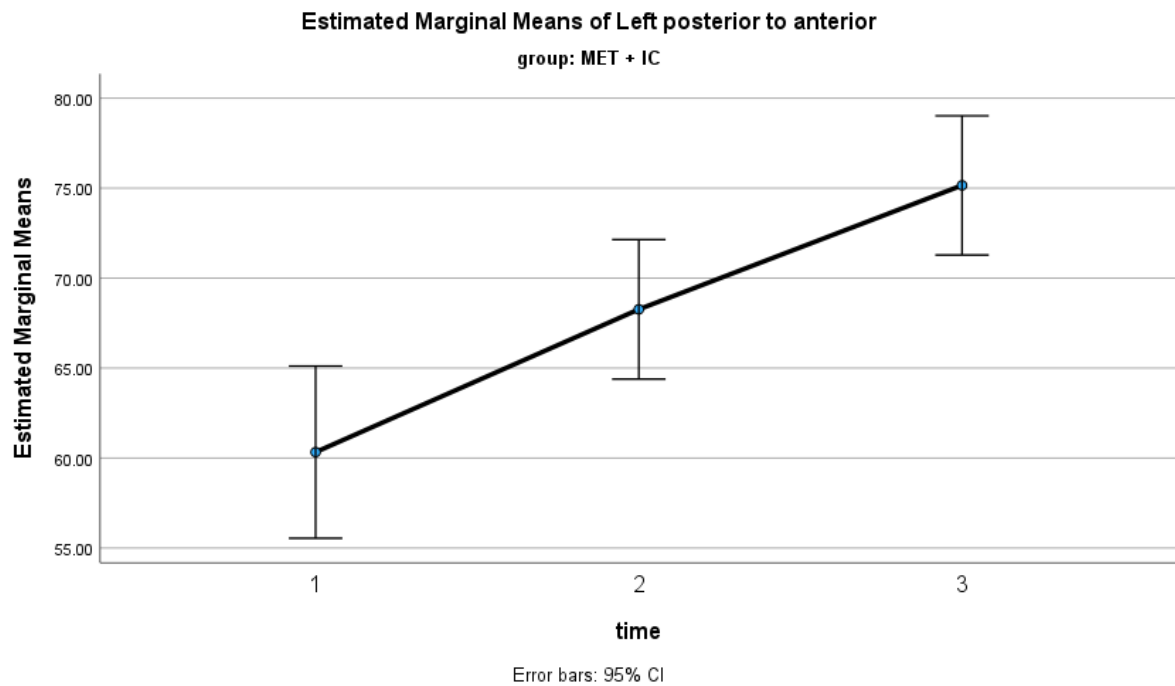
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.800	25.984 <sup>c</sup>	2.000	13.000	<0.001
	Wilks' Lambda	0.200	25.984 <sup>c</sup>	2.000	13.000	<0.001
	Hotelling's Trace	3.998	25.984 <sup>c</sup>	2.000	13.000	<0.001
	Roy's Largest Root	3.998	25.984 <sup>c</sup>	2.000	13.000	<0.001
	Root					

a. group = MET + IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



#### Right posterior to anterior

There was a statistically significant change over time for this outcome in this group ( $p=0.003$ ). The plot shows it was an increase over time in all time periods.

#### Multivariate Tests<sup>a,b</sup>

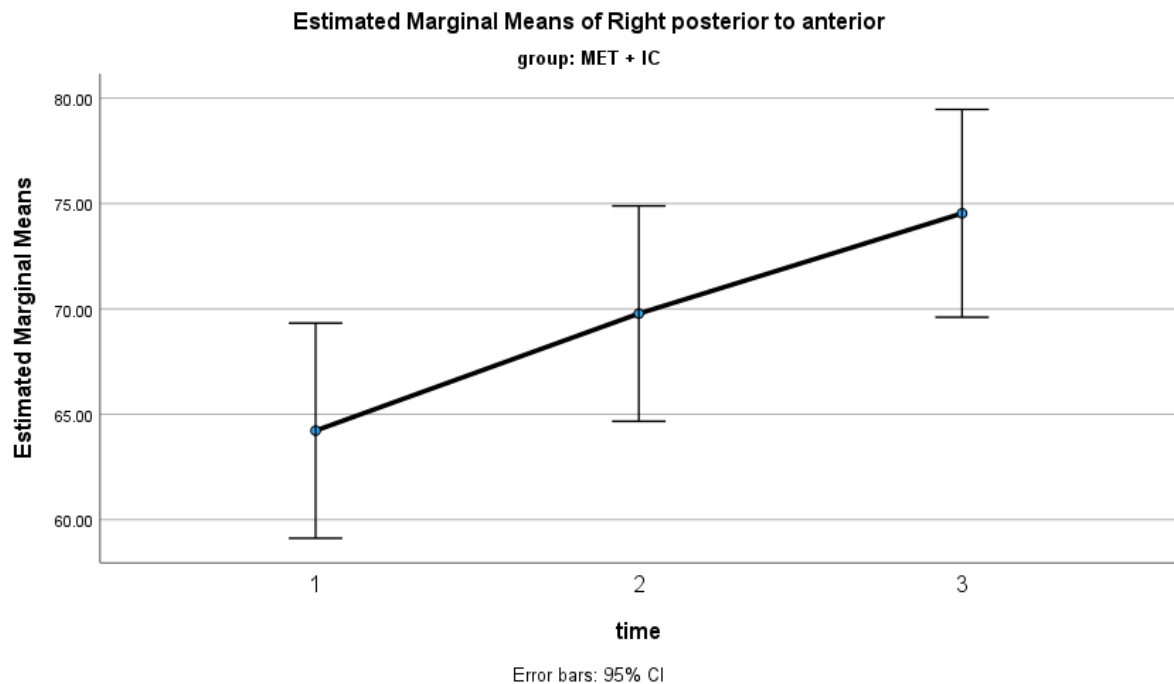
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.592	9.445 <sup>c</sup>	2.000	13.000	0.003
	Wilks' Lambda	0.408	9.445 <sup>c</sup>	2.000	13.000	0.003
	Hotelling's Trace	1.453	9.445 <sup>c</sup>	2.000	13.000	0.003
	Roy's Largest Root	1.453	9.445 <sup>c</sup>	2.000	13.000	0.003
	Root					

a. group = MET + IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



### Pain pressure threshold

This variable had a very skewed distribution, therefore it was transformed using  $\log_{10}$  and the logged values (which were normally distributed) were used in the analysis. There was a very statistically significant change over time in this outcome ( $p=0.001$ ) in this group. The plot below shows that the change was positive over all time periods.

### Multivariate Tests<sup>a,b</sup>

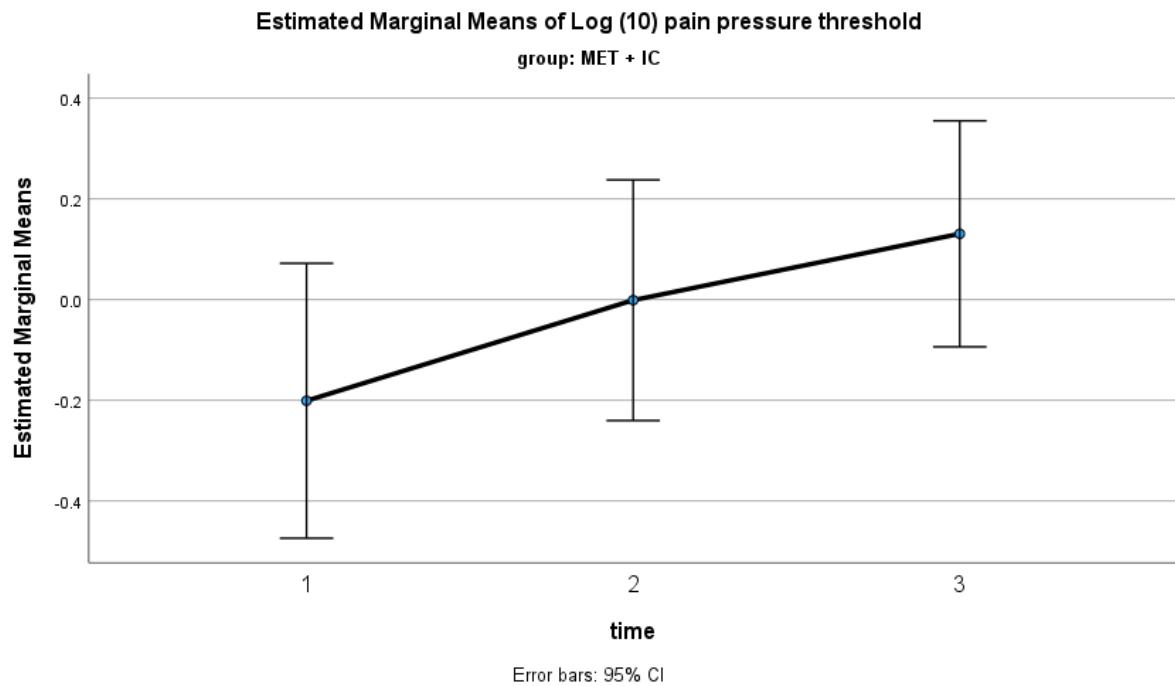
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.648	11.970 <sup>c</sup>	2.000	13.000	0.001
	Wilks' Lambda	0.352	11.970 <sup>c</sup>	2.000	13.000	0.001
	Hotelling's Trace	1.842	11.970 <sup>c</sup>	2.000	13.000	0.001
	Roy's Largest Root	1.842	11.970 <sup>c</sup>	2.000	13.000	0.001
	Root					

a. group = MET + IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



## NRS

There was a highly statistically significant decrease in NRS score over time in this group ( $p < 0.001$ )

## Multivariate Tests<sup>a,b</sup>

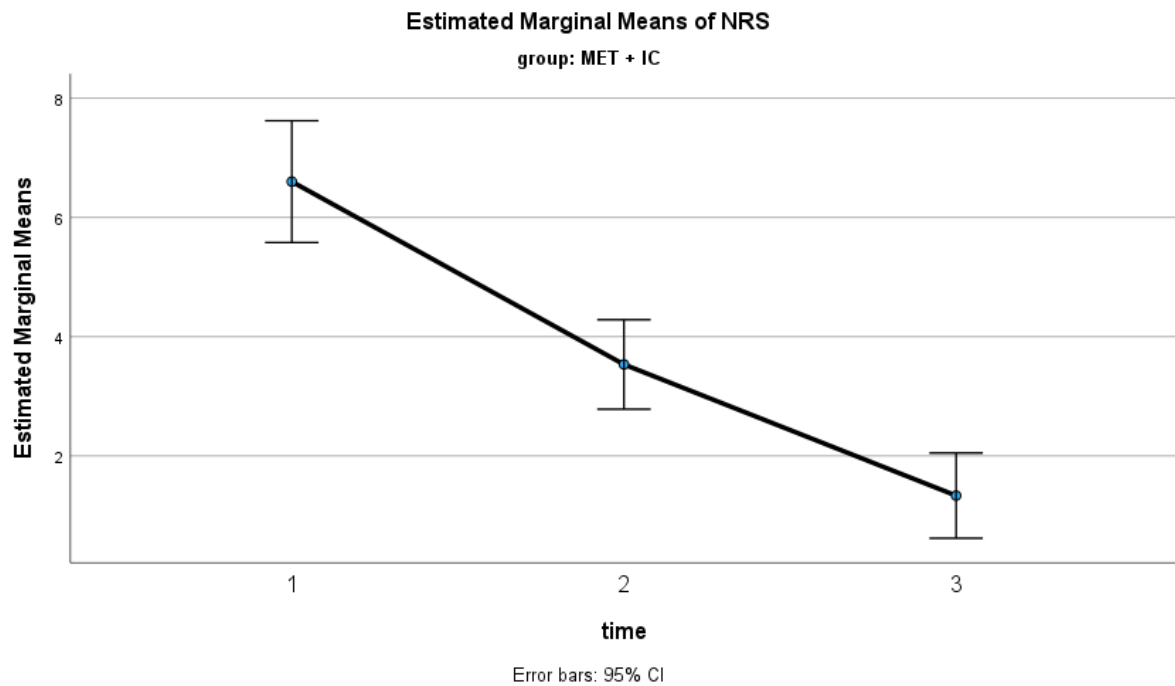
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.933	90.403 <sup>c</sup>	2.000	13.000	<0.001
	Wilks' Lambda	0.067	90.403 <sup>c</sup>	2.000	13.000	<0.001
	Hotelling's Trace	13.908	90.403 <sup>c</sup>	2.000	13.000	<0.001
	Roy's Largest Root	13.908	90.403 <sup>c</sup>	2.000	13.000	<0.001
	Root					

a. group = MET + IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



#### Total disability score

This score decreased significantly between pre and post intervention in this group ( $p < 0.001$ )

#### Multivariate Tests<sup>a,b</sup>

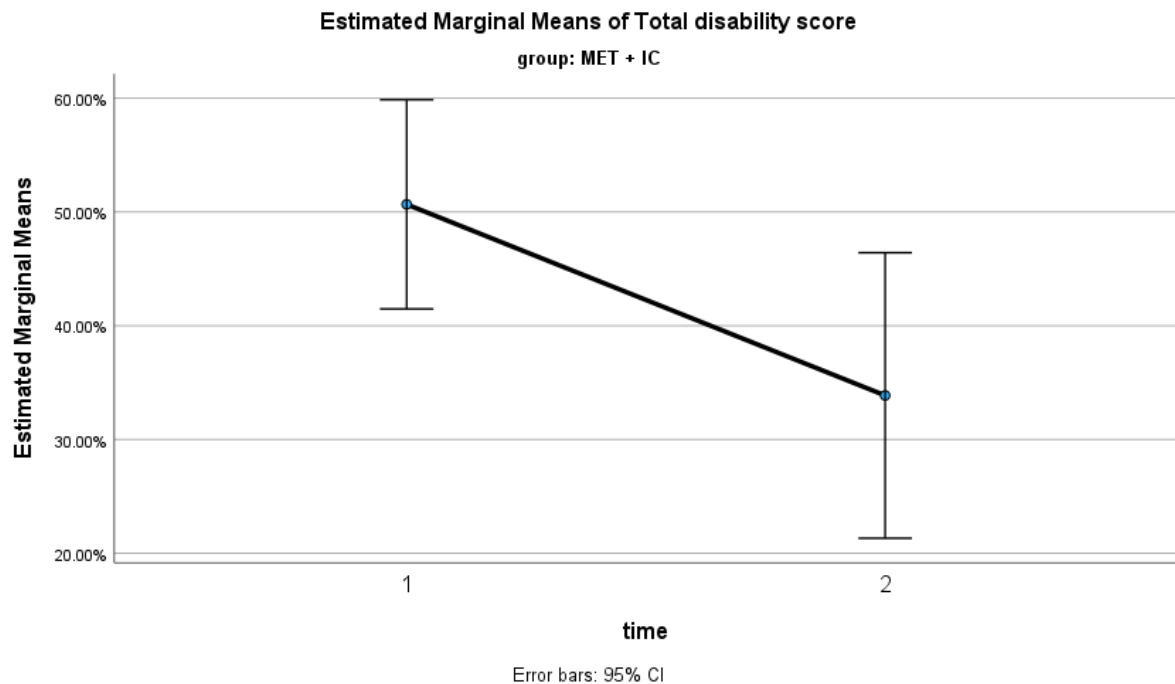
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.597	20.707 <sup>c</sup>	1.000	14.000	<0.001
	Wilks' Lambda	0.403	20.707 <sup>c</sup>	1.000	14.000	<0.001
	Hotelling's Trace	1.479	20.707 <sup>c</sup>	1.000	14.000	<0.001
	Roy's Largest Root	1.479	20.707 <sup>c</sup>	1.000	14.000	<0.001
	Root					

a. group = MET + IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



### Emotional disability scores

Emotional disability scores decreased significantly over time ( $p=0.007$ ) in this group.

### Multivariate Tests<sup>a,b</sup>

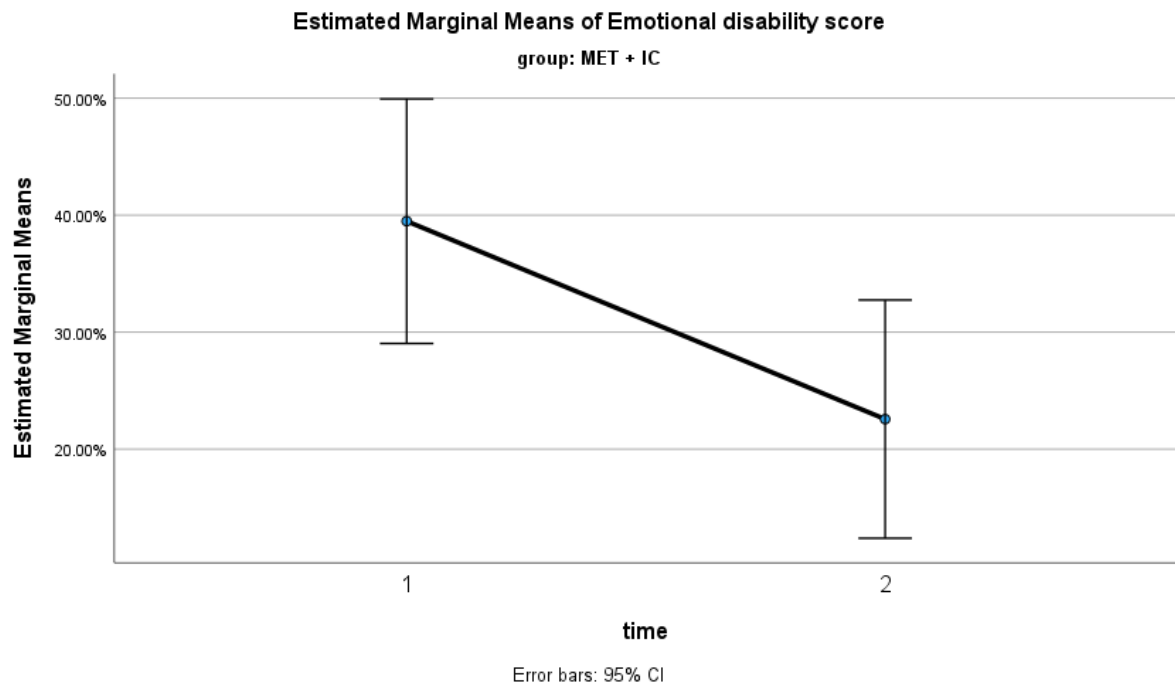
Effect	Value	F	Hypothesis df	Error df	Sig.
time Pillai's Trace	0.421	10.174 <sup>c</sup>	1.000	14.000	0.007
Wilks' Lambda	0.579	10.174 <sup>c</sup>	1.000	14.000	0.007
Hotelling's Trace	0.727	10.174 <sup>c</sup>	1.000	14.000	0.007
Roy's Largest Root	0.727	10.174 <sup>c</sup>	1.000	14.000	0.007

a. group = MET + IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



### Functional disability

Functional disability score decreased very significantly over time in this group ( $p < 0.001$ )

### Multivariate Tests<sup>a,b</sup>

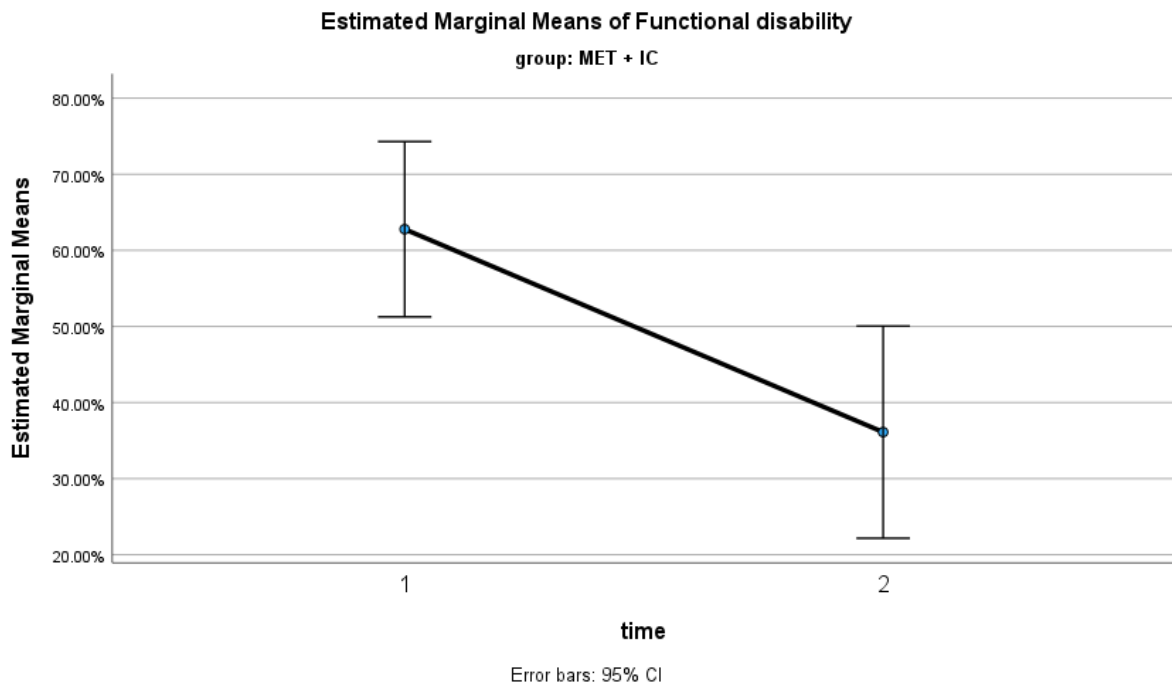
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.559	17.713 <sup>c</sup>	1.000	14.000	<0.001
	Wilks' Lambda	0.441	17.713 <sup>c</sup>	1.000	14.000	<0.001
	Hotelling's Trace	1.265	17.713 <sup>c</sup>	1.000	14.000	<0.001
	Roy's Largest	1.265	17.713 <sup>c</sup>	1.000	14.000	<0.001
	Root					

a. group = MET + IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



2. To determine the effectiveness of muscle energy technique alone in the treatment of cervicogenic headache in terms of subjective and objective findings.

This objective was a within-group comparison from pre to immediately after and days after intervention of the MET alone group.

#### **Left posterior to anterior**

There was a highly statistically significant change over time for this outcome in this group ( $p < 0.001$ ). The plot shows it was an increase over time in all time periods.

#### **Multivariate Tests<sup>a,b</sup>**

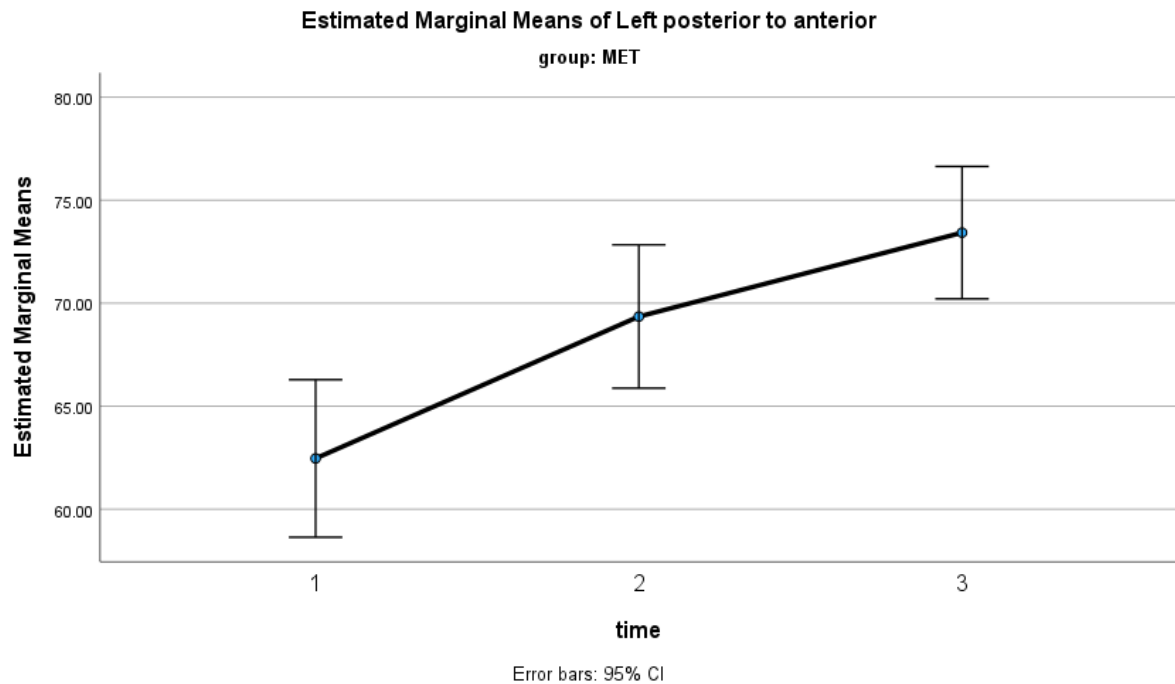
Effect	Value	F	Hypothesis df	Error df	Sig.
time Pillai's Trace	0.720	16.704 <sup>c</sup>	2.000	13.000	<0.001
Wilks' Lambda	0.280	16.704 <sup>c</sup>	2.000	13.000	<0.001
Hotelling's Trace	2.570	16.704 <sup>c</sup>	2.000	13.000	<0.001
Roy's Largest Root	2.570	16.704 <sup>c</sup>	2.000	13.000	<0.001

a. group = MET

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



**Right posterior to anterior**

There was a highly statistically significant change over time for this outcome in this group ( $p < 0.001$ ). The plot shows it was an increase over time in all time periods.

**Multivariate Tests<sup>a,b</sup>**

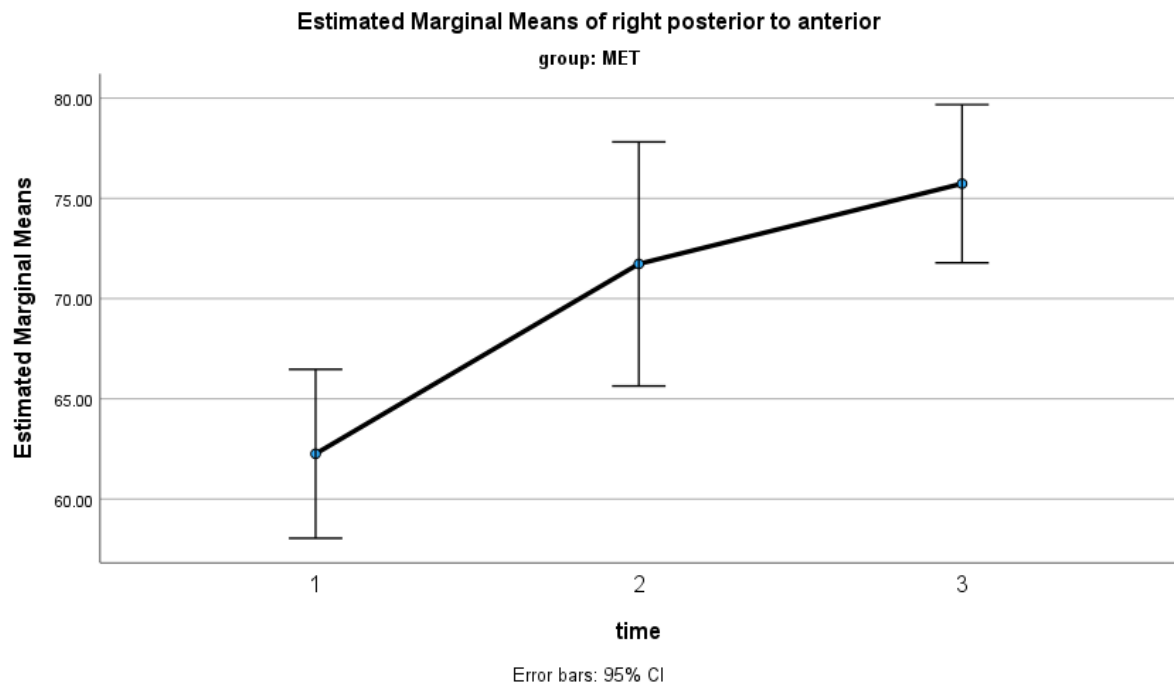
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.761	20.680 <sup>c</sup>	2.000	13.000	<0.001
	Wilks' Lambda	0.239	20.680 <sup>c</sup>	2.000	13.000	<0.001
	Hotelling's Trace	3.182	20.680 <sup>c</sup>	2.000	13.000	<0.001
	Roy's Largest Root	3.182	20.680 <sup>c</sup>	2.000	13.000	<0.001
	Root					

a. group = MET

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



### Pain pressure threshold

There was a very statistically significant change over time in this outcome ( $p < 0.001$ ) in this group.

The plot below shows that the change was positive over all time periods.

### Multivariate Tests<sup>a,b</sup>

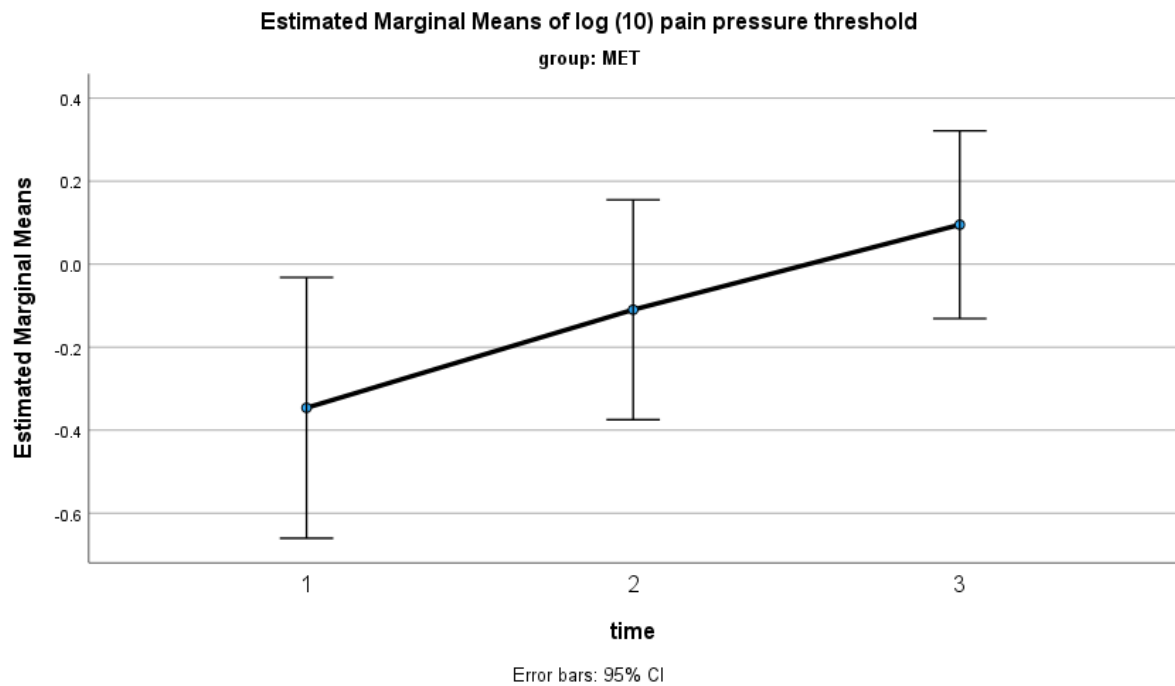
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.745	19.020 <sup>c</sup>	2.000	13.000	<0.001
	Wilks' Lambda	0.255	19.020 <sup>c</sup>	2.000	13.000	<0.001
	Hotelling's Trace	2.926	19.020 <sup>c</sup>	2.000	13.000	<0.001
	Roy's Largest Root	2.926	19.020 <sup>c</sup>	2.000	13.000	<0.001
	Root					

a. group = MET

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



## NRS

There was a highly statistically significant decrease in NRS score over time in this group ( $p < 0.001$ )

## Multivariate Tests<sup>a,b</sup>

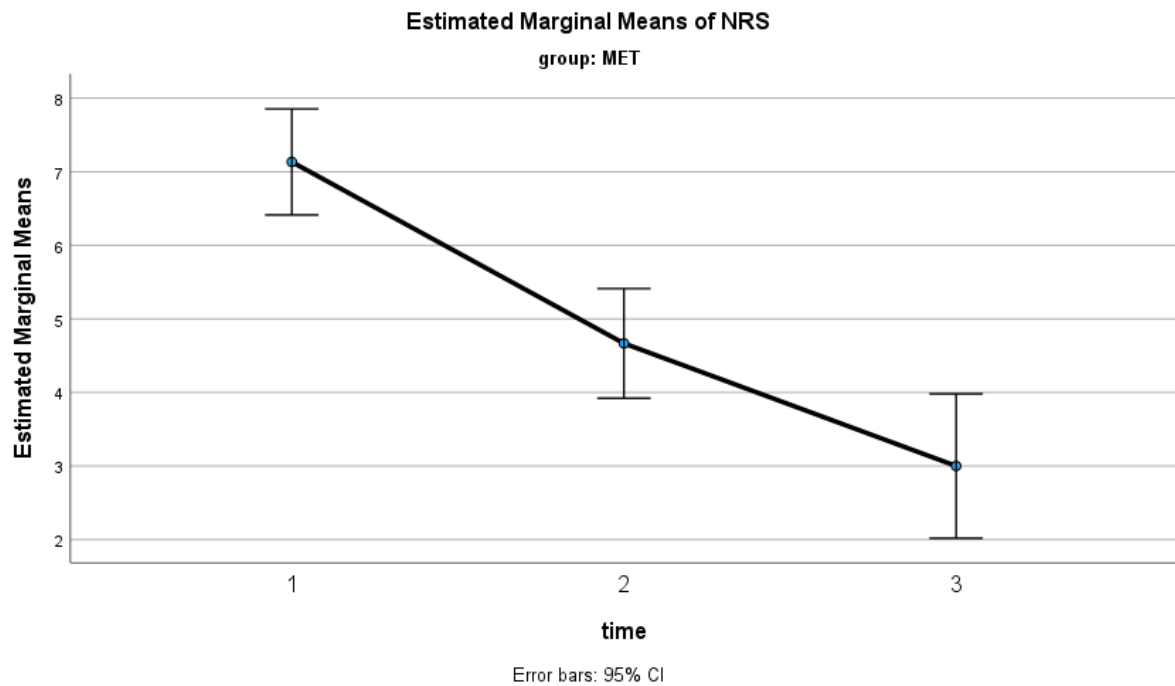
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.856	38.753 <sup>c</sup>	2.000	13.000	<0.001
	Wilks' Lambda	0.144	38.753 <sup>c</sup>	2.000	13.000	<0.001
	Hotelling's Trace	5.962	38.753 <sup>c</sup>	2.000	13.000	<0.001
	Roy's Largest Root	5.962	38.753 <sup>c</sup>	2.000	13.000	<0.001
	Root					

a. group = MET

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



#### Total disability scores

This score decreased significantly between pre and post intervention in this group ( $p < 0.0001$ )

#### Multivariate Tests<sup>a,b</sup>

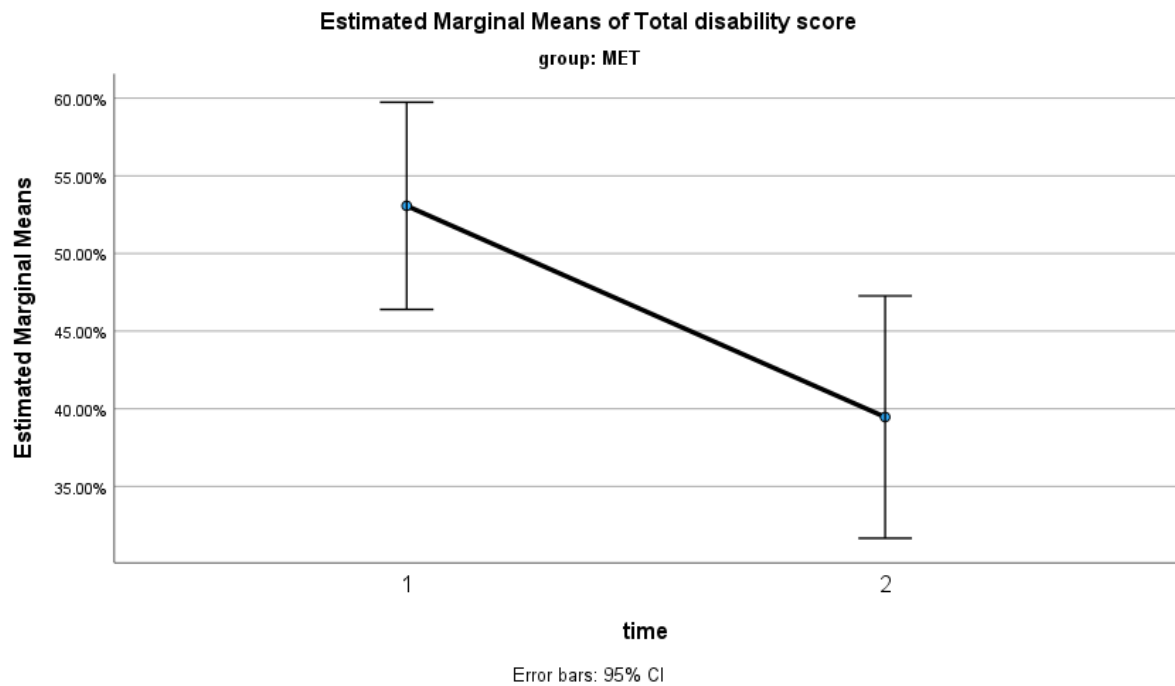
Effect	Value	F	Hypothesis df	Error df	Sig.
time Pillai's Trace	0.575	18.951 <sup>c</sup>	1.000	14.000	<0.001
Wilks' Lambda	0.425	18.951 <sup>c</sup>	1.000	14.000	<0.001
Hotelling's Trace	1.354	18.951 <sup>c</sup>	1.000	14.000	<0.001
Roy's Largest Root	1.354	18.951 <sup>c</sup>	1.000	14.000	<0.001

a. group = MET

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



#### Emotional disability scores

Emotional disability scores did not decrease significantly over time ( $p=0.195$ ) in this group.

#### Multivariate Tests<sup>a,b</sup>

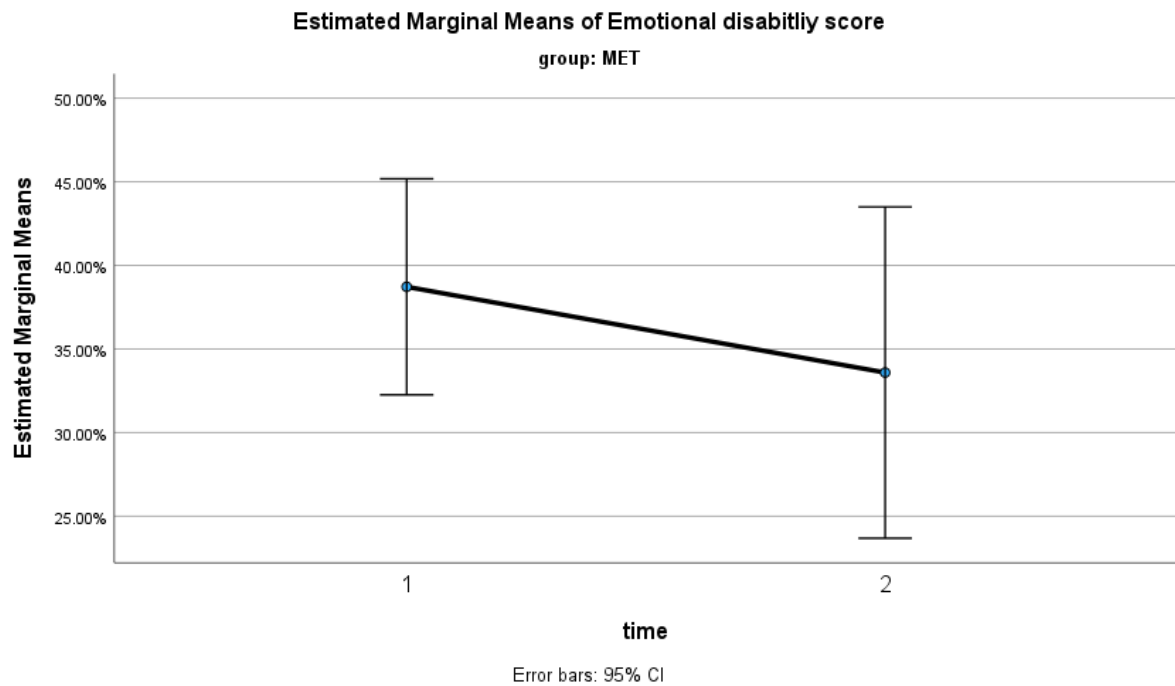
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.117	1.854 <sup>c</sup>	1.000	14.000	0.195
	Wilks' Lambda	0.883	1.854 <sup>c</sup>	1.000	14.000	0.195
	Hotelling's Trace	0.132	1.854 <sup>c</sup>	1.000	14.000	0.195
	Roy's Largest Root	0.132	1.854 <sup>c</sup>	1.000	14.000	0.195
	Root					

a. group = MET

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



#### Functional disability

Functional disability score decreased very significantly over time in this group ( $p < 0.001$ )

#### Multivariate Tests<sup>a,b</sup>

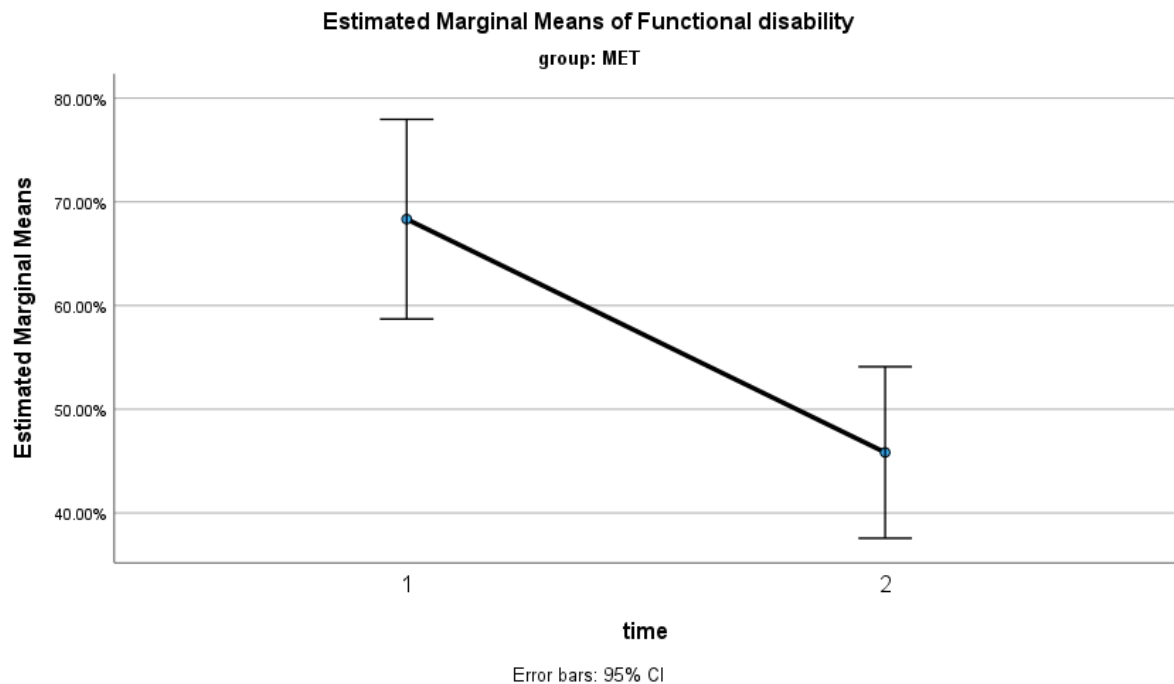
Effect	Value	F	Hypothesis df	Error df	Sig.
time Pillai's Trace	0.610	21.901 <sup>c</sup>	1.000	14.000	<0.001
Wilks' Lambda	0.390	21.901 <sup>c</sup>	1.000	14.000	<0.001
Hotelling's Trace	1.564	21.901 <sup>c</sup>	1.000	14.000	<0.001
Roy's Largest Root	1.564	21.901 <sup>c</sup>	1.000	14.000	<0.001

a. group = MET

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



3. To determine the effectiveness of ischaemic compression alone in the treatment of cervicogenic headache in terms of subjective and objective findings.

This objective was a within-group comparison from pre to immediately after and days after intervention of the IC alone group.

#### **Left posterior to anterior**

There was a highly statistically significant change over time for this outcome in this group ( $p < 0.001$ ). The plot shows it was an increase over time in all time periods.

#### **Multivariate Tests<sup>a,b</sup>**

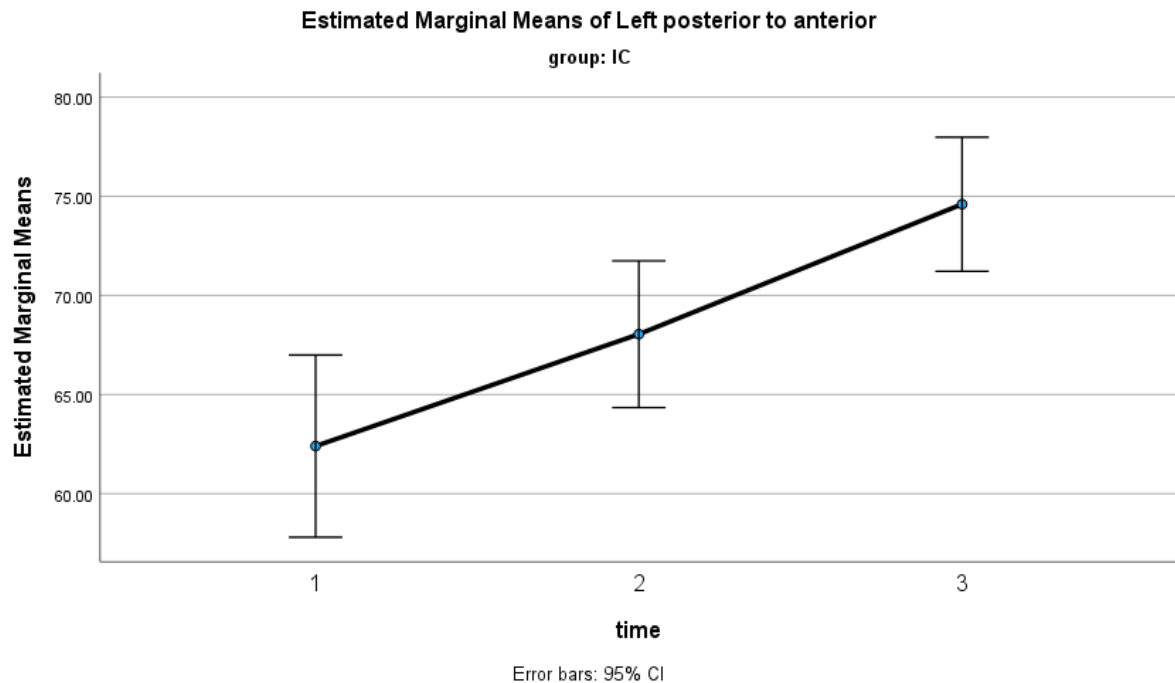
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.828	31.293 <sup>c</sup>	2.000	13.000	<0.001
	Wilks' Lambda	0.172	31.293 <sup>c</sup>	2.000	13.000	<0.001
	Hotelling's Trace	4.814	31.293 <sup>c</sup>	2.000	13.000	<0.001
	Roy's Largest	4.814	31.293 <sup>c</sup>	2.000	13.000	<0.001
	Root					

a. group = IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



#### Right posterior to anterior

There was a highly statistically significant change over time for this outcome in this group ( $p < 0.001$ ). The plot shows it was an increase over time in all time periods.

#### Multivariate Tests<sup>a,b</sup>

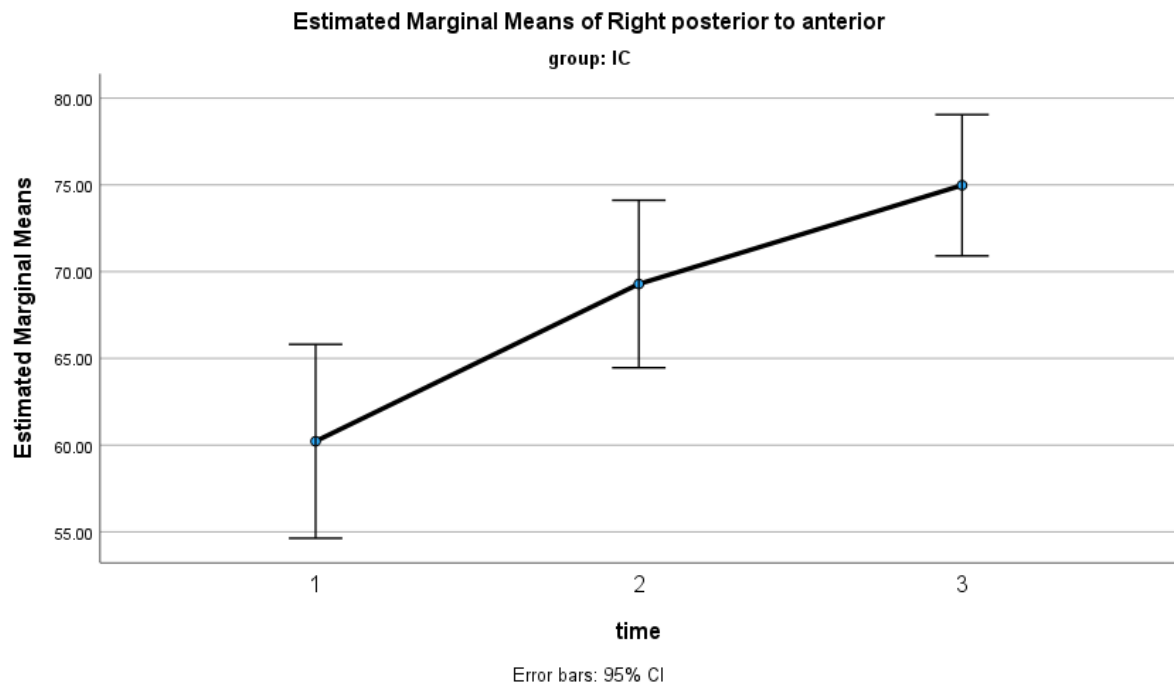
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.728	17.388 <sup>c</sup>	2.000	13.000	<0.001
	Wilks' Lambda	0.272	17.388 <sup>c</sup>	2.000	13.000	<0.001
	Hotelling's Trace	2.675	17.388 <sup>c</sup>	2.000	13.000	<0.001
	Roy's Largest	2.675	17.388 <sup>c</sup>	2.000	13.000	<0.001
	Root					

a. group = IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



### Pain pressure threshold

There was a very statistically significant change over time in this outcome ( $p=0.002$ ) in this group.

The plot below shows that the change was positive over all time periods.

### Multivariate Tests<sup>a,b</sup>

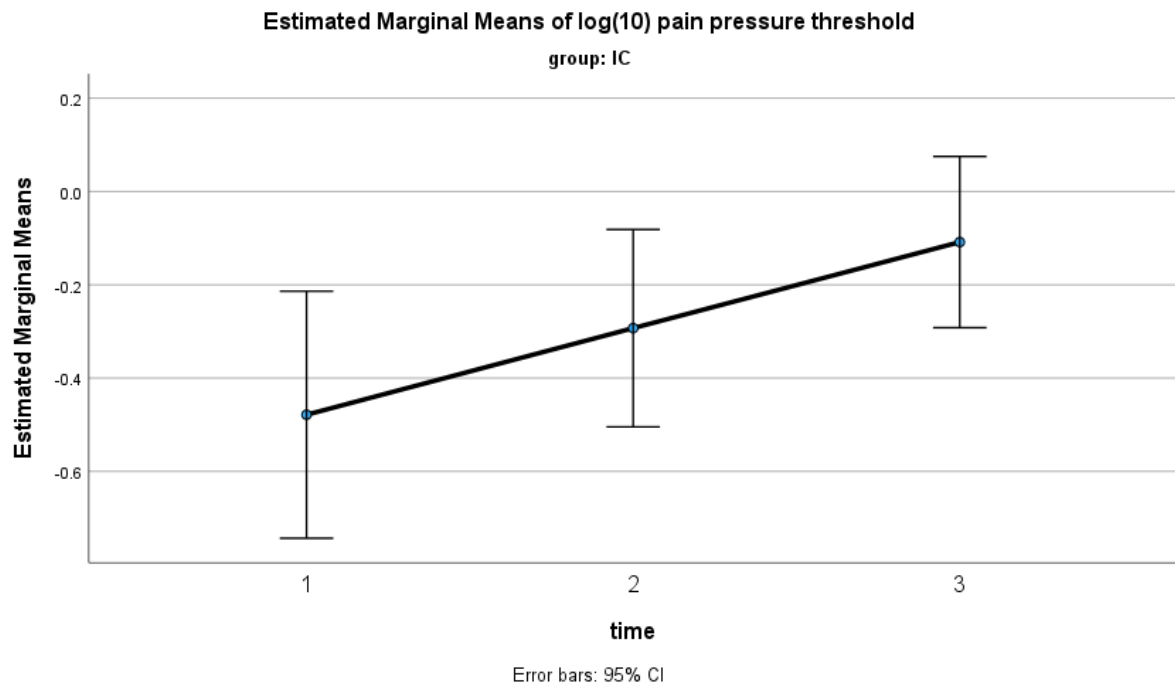
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.605	9.952 <sup>c</sup>	2.000	13.000	0.002
	Wilks' Lambda	0.395	9.952 <sup>c</sup>	2.000	13.000	0.002
	Hotelling's Trace	1.531	9.952 <sup>c</sup>	2.000	13.000	0.002
	Roy's Largest Root	1.531	9.952 <sup>c</sup>	2.000	13.000	0.002
	Root					

a. group = IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



## NRS

There was a highly statistically significant decrease in NRS score over time in this group ( $p < 0.001$ )

## Multivariate Tests<sup>a,b</sup>

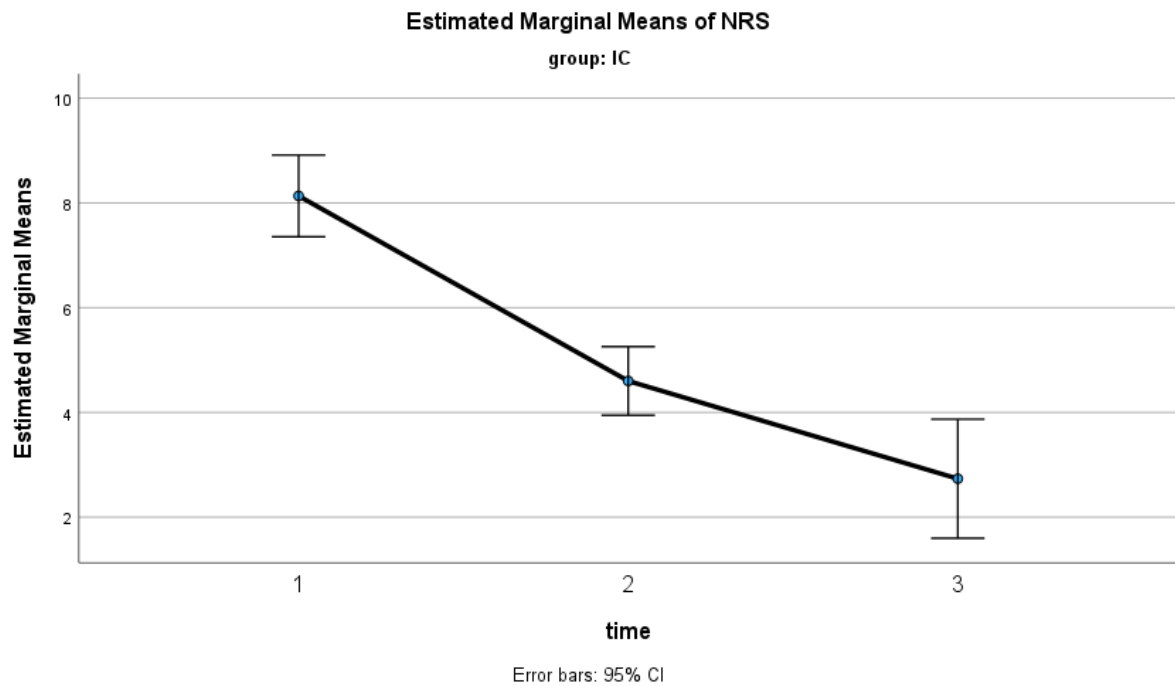
Effect	Value	F	Hypothesis df	Error df	Sig.
time Pillai's Trace	0.906	62.891 <sup>c</sup>	2.000	13.000	<0.001
Wilks' Lambda	0.094	62.891 <sup>c</sup>	2.000	13.000	<0.001
Hotelling's Trace	9.676	62.891 <sup>c</sup>	2.000	13.000	<0.001
Roy's Largest Root	9.676	62.891 <sup>c</sup>	2.000	13.000	<0.001

a. group = IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



#### Total disability score

This score decreased significantly between pre and post intervention in this group ( $p=0.003$ )

#### Multivariate Tests<sup>a,b</sup>

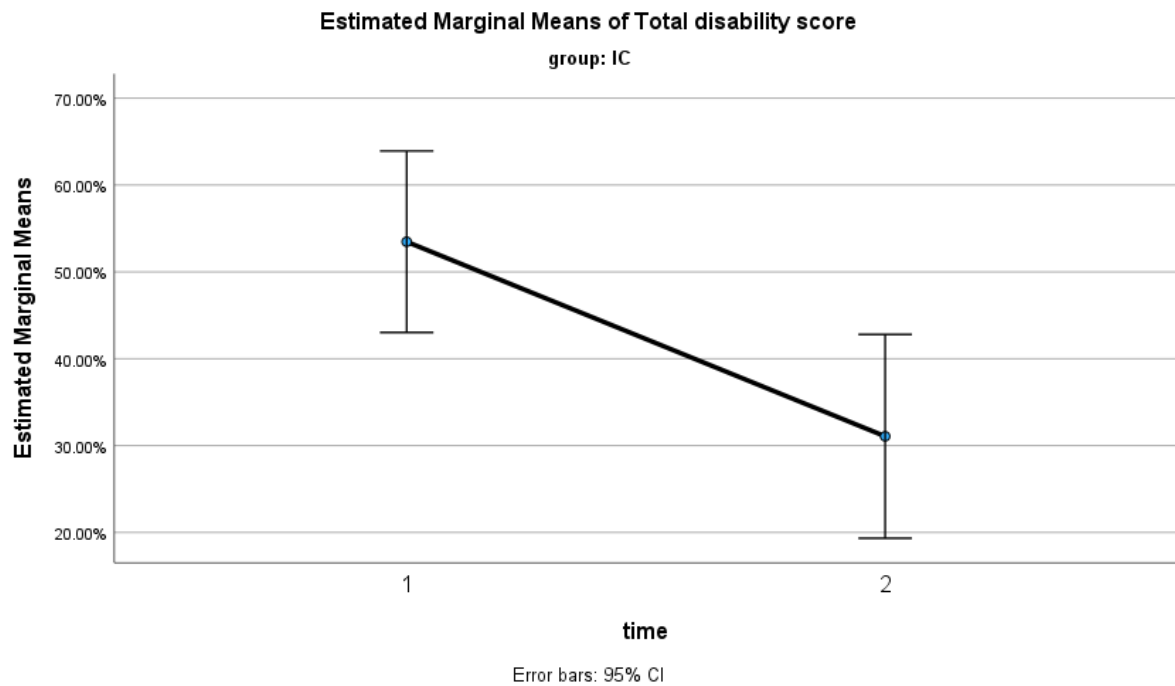
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.486	13.221 <sup>c</sup>	1.000	14.000	0.003
	Wilks' Lambda	0.514	13.221 <sup>c</sup>	1.000	14.000	0.003
	Hotelling's Trace	0.944	13.221 <sup>c</sup>	1.000	14.000	0.003
	Roy's Largest Root	0.944	13.221 <sup>c</sup>	1.000	14.000	0.003
	Root					

a. group = IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



### Emotional disability scores

Emotional disability scores decreased very significantly over time ( $p < 0.001$ ) in this group.

### Multivariate Tests<sup>a,b</sup>

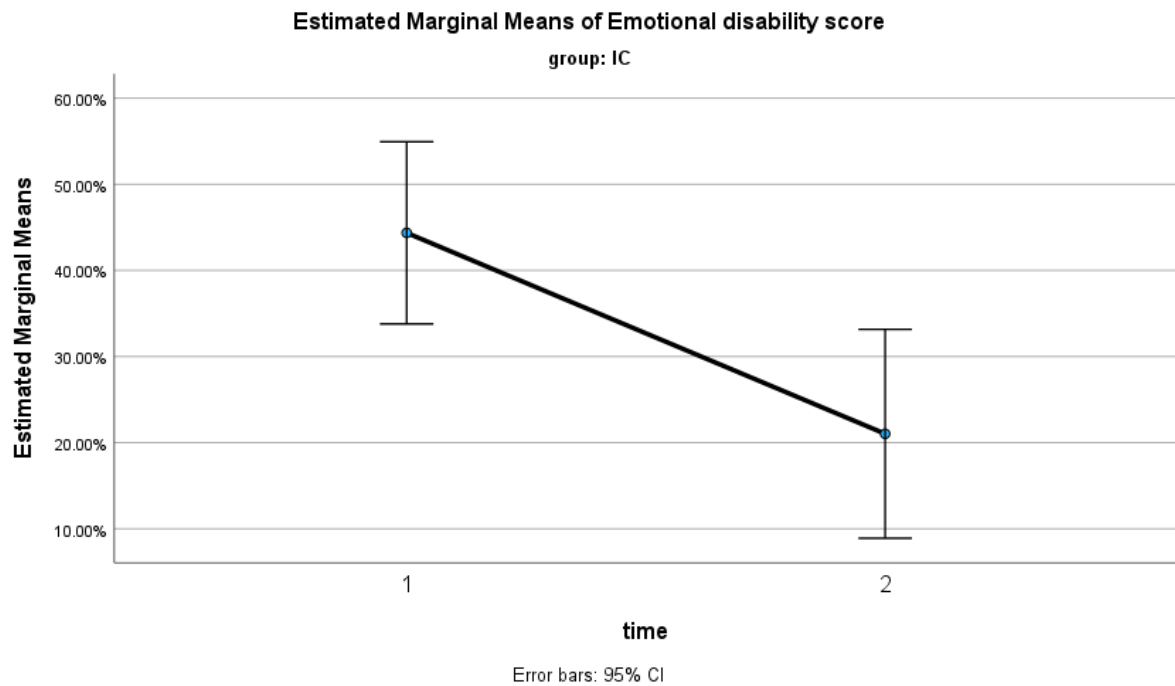
Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.614	22.278 <sup>c</sup>	1.000	14.000	<0.001
	Wilks' Lambda	0.386	22.278 <sup>c</sup>	1.000	14.000	<0.001
	Hotelling's Trace	1.591	22.278 <sup>c</sup>	1.000	14.000	<0.001
	Roy's Largest Root	1.591	22.278 <sup>c</sup>	1.000	14.000	<0.001
	Root					

a. group = IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



### Functional disability

Functional disability score decreased very significantly over time in this group ( $p < 0.001$ )

### Multivariate Tests<sup>a,b</sup>

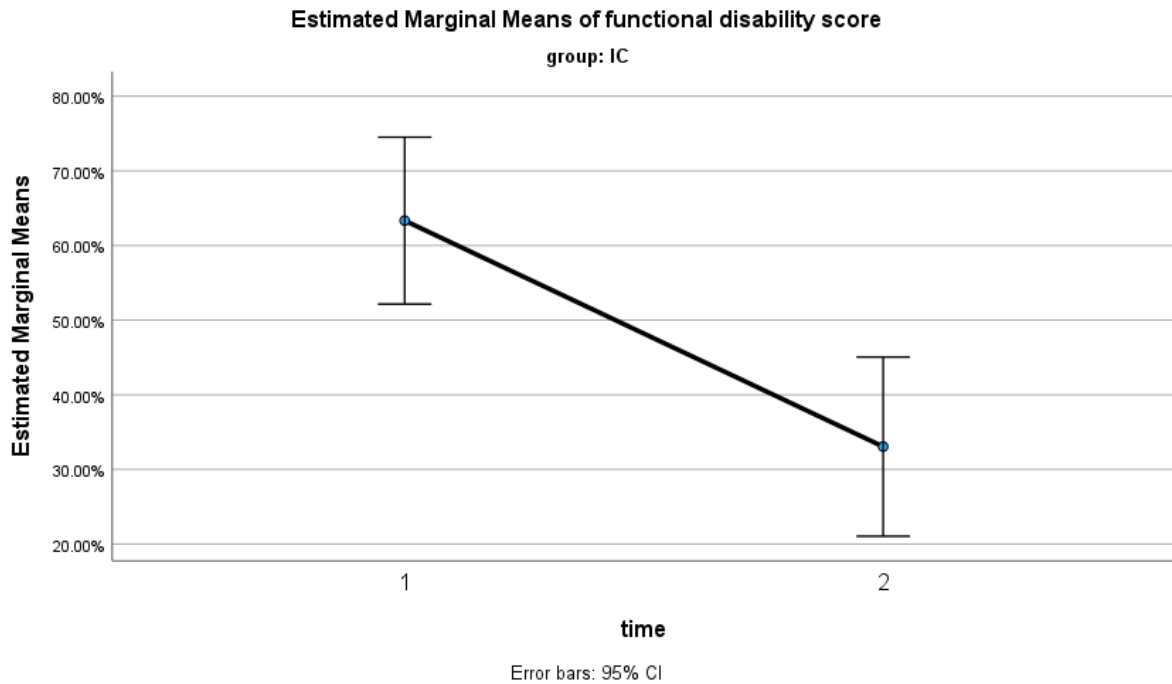
Effect	Value	F	Hypothesis df	Error df	Sig.
time Pillai's Trace	0.704	33.307 <sup>c</sup>	1.000	14.000	<0.001
Wilks' Lambda	0.296	33.307 <sup>c</sup>	1.000	14.000	<0.001
Hotelling's Trace	2.379	33.307 <sup>c</sup>	1.000	14.000	<0.001
Roy's Largest Root	2.379	33.307 <sup>c</sup>	1.000	14.000	<0.001

a. group = IC

b. Design: Intercept

Within Subjects Design: time

c. Exact statistic



4. To compare the three groups in terms of subjective and objective findings.

This objective was a between-group comparison of the pre to immediately after and days after intervention change between the three groups.

#### Left posterior to anterior

There was no interaction between time and treatment group for this outcome ( $p=0.426$ ). This means that all treatment groups experienced a significant increase over time (effect of time  $p<0.001$ ) but this was not dependent on treatment. The group effect was  $p=0.971$ . Therefore type of treatment did not influence left posterior to anterior change and all groups did equally well. This is shown by the parallel profiles in the plot.

#### Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.771	68.925 <sup>b</sup>	2.000	41.000	<0.001
	Wilks' Lambda	0.229	68.925 <sup>b</sup>	2.000	41.000	<0.001
	Hotelling's Trace	3.362	68.925 <sup>b</sup>	2.000	41.000	<0.001
	Roy's Largest Root	3.362	68.925 <sup>b</sup>	2.000	41.000	<0.001
	Root					

time *	Pillai's Trace	0.091	0.997	4.000	84.000	0.414
group	Wilks' Lambda	0.911	0.974 <sup>b</sup>	4.000	82.000	0.426
	Hotelling's Trace	0.095	0.951	4.000	80.000	0.439
	Roy's Largest Root	0.056	1.183 <sup>c</sup>	2.000	42.000	0.316

a. Design: Intercept + group

Within Subjects Design: time

b. Exact statistic

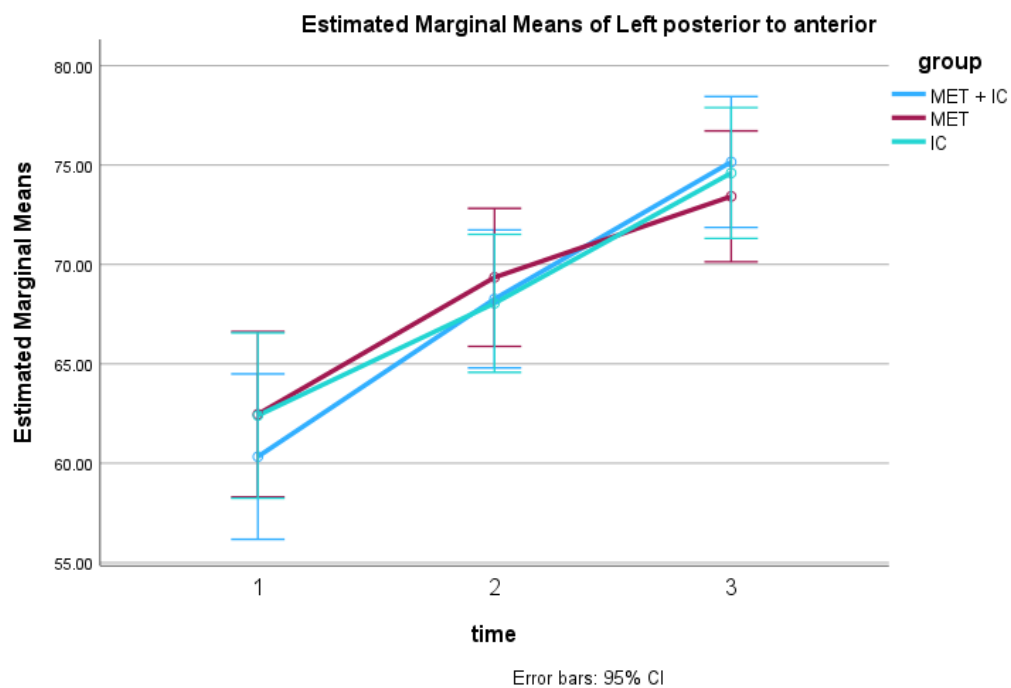
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	628386.704	1	628386.704	5601.573	<0.001
group	6.540	2	3.270	0.029	0.971
Error	4711.576	42	112.180		



Right posterior to anterior

There was no interaction between time and treatment group for this outcome ( $p=0.598$ ). This means that all treatment groups experienced a significant increase over time (effect of time  $p<0.001$ ) but this was not dependent on treatment. The group effect was  $p=0.805$ . Therefore type of treatment did not influence right posterior to anterior change and all groups did equally well. This is shown by the parallel profiles in the plot.

### Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.693	46.196 <sup>b</sup>	2.000	41.000	<0.001
	Wilks' Lambda	0.307	46.196 <sup>b</sup>	2.000	41.000	<0.001
	Hotelling's Trace	2.253	46.196 <sup>b</sup>	2.000	41.000	<0.001
	Roy's Largest Root	2.253	46.196 <sup>b</sup>	2.000	41.000	<0.001
time * group	Pillai's Trace	0.065	0.706	4.000	84.000	0.590
	Wilks' Lambda	0.936	0.695 <sup>b</sup>	4.000	82.000	0.598
	Hotelling's Trace	0.068	0.683	4.000	80.000	0.606
	Roy's Largest Root	0.058	1.225 <sup>c</sup>	2.000	42.000	0.304

a. Design: Intercept + group

Within Subjects Design: time

b. Exact statistic

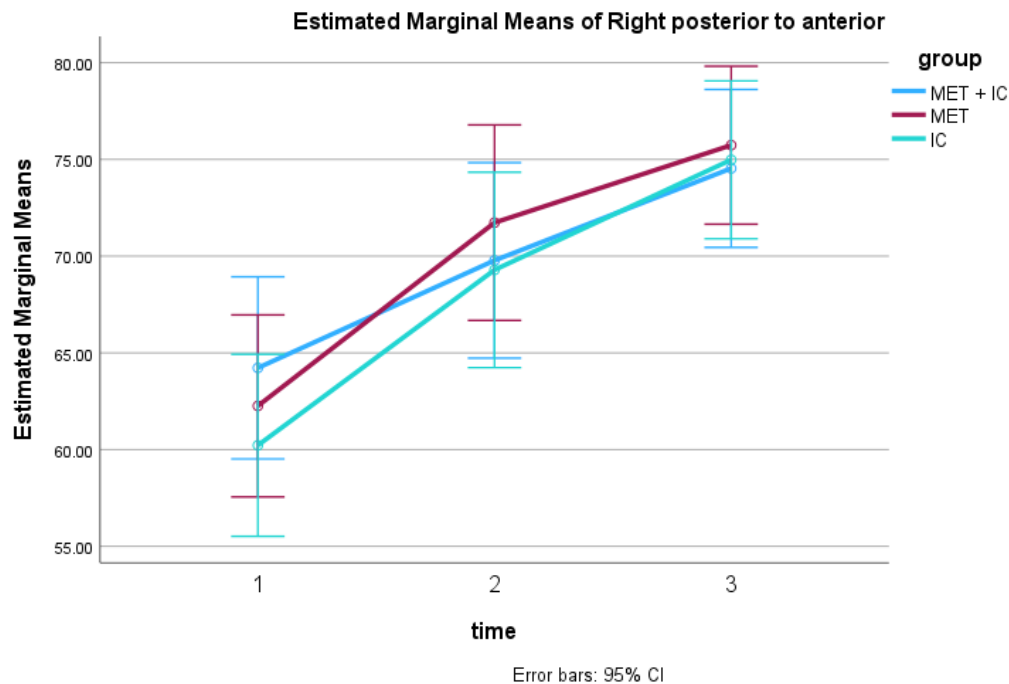
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	646342.400	1	646342.400	3743.668	<0.001
group	75.326	2	37.663	0.218	0.805
Error	7251.279	42	172.649		



### Pain pressure threshold

This variable had a very skewed distribution, therefore it was transformed using  $\log_{10}$  and the logged values (which were normally distributed) were used in the analysis. There was no interaction between time and treatment group for this outcome ( $p=0.823$ ). This means that all treatment groups experienced a significant increase over time (effect of time  $p<0.001$ ) but this was not dependent on treatment. The group effect was  $p=0.220$ . Therefore type of treatment did not influence pain pressure threshold change and all groups did equally well. This is shown by the parallel profiles in the plot.

### Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.613	32.526 <sup>b</sup>	2.000	41.000	<0.001
	Wilks' Lambda	0.387	32.526 <sup>b</sup>	2.000	41.000	<0.001
	Hotelling's Trace	1.587	32.526 <sup>b</sup>	2.000	41.000	<0.001
	Roy's Largest Root	1.587	32.526 <sup>b</sup>	2.000	41.000	<0.001
	Root					
time * group	Pillai's Trace	0.035	0.379	4.000	84.000	0.823
	Wilks' Lambda	0.965	0.371 <sup>b</sup>	4.000	82.000	0.828

Hotelling's Trace	0.036	0.364	4.000	80.000	0.834
Roy's Largest Root	0.030	0.630 <sup>c</sup>	2.000	42.000	0.538

a. Design: Intercept + group

Within Subjects Design: time

b. Exact statistic

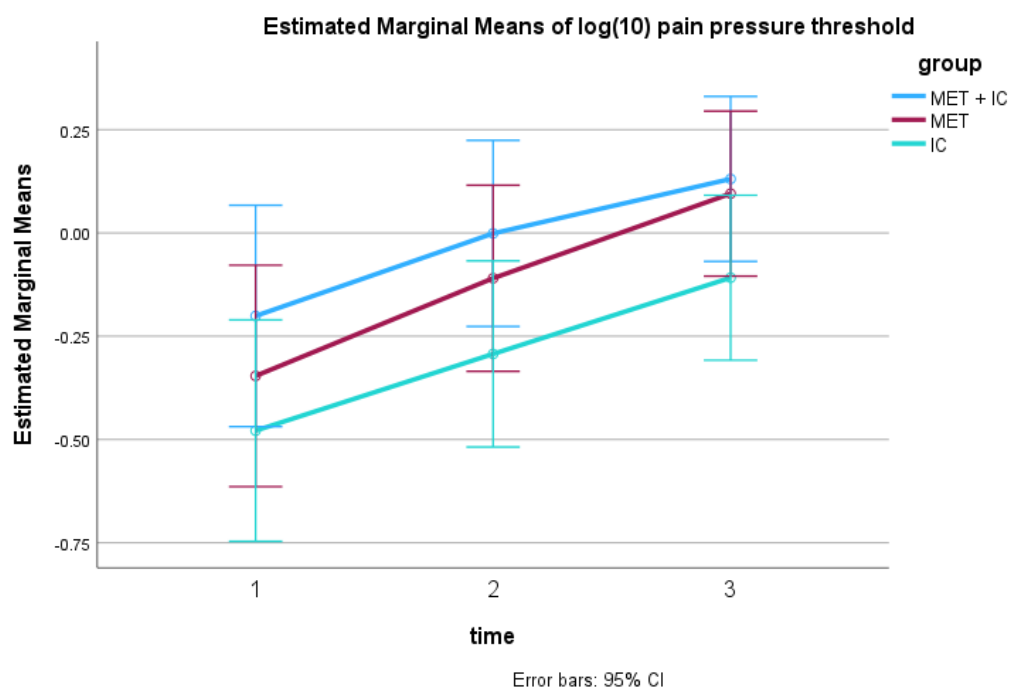
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	2.871	1	2.871	5.368	0.025
group	1.678	2	0.839	1.569	0.220
Error	22.461	42	0.535		



### Pain numerical rating scale

There was no interaction between time and treatment group for this outcome ( $p=0.117$ ). This means that all treatment groups experienced a significant decrease over time (effect of time  $p<0.001$ ) but

this was not dependent on treatment. The group effect was  $p=0.015$  which suggests that the pain experienced was different at baseline and this difference persisted over time. This is shown in the plot as the combination group experienced lower pain than the other two groups at all time points. Therefore type of treatment did not influence pain pressure threshold change and all groups did equally well. This is shown by the parallel profiles in the plot.

### Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.899	182.815 <sup>b</sup>	2.000	41.000	<0.001
	Wilks' Lambda	0.101	182.815 <sup>b</sup>	2.000	41.000	<0.001
	Hotelling's Trace	8.918	182.815 <sup>b</sup>	2.000	41.000	<0.001
	Roy's Largest Root	8.918	182.815 <sup>b</sup>	2.000	41.000	<0.001
	Root					
time * group	Pillai's Trace	0.166	1.904	4.000	84.000	0.117
	Wilks' Lambda	0.837	1.903 <sup>b</sup>	4.000	82.000	0.118
	Hotelling's Trace	0.190	1.900	4.000	80.000	0.119
	Roy's Largest Root	0.164	3.438 <sup>c</sup>	2.000	42.000	0.041
	Root					

a. Design: Intercept + group

Within Subjects Design: time

b. Exact statistic

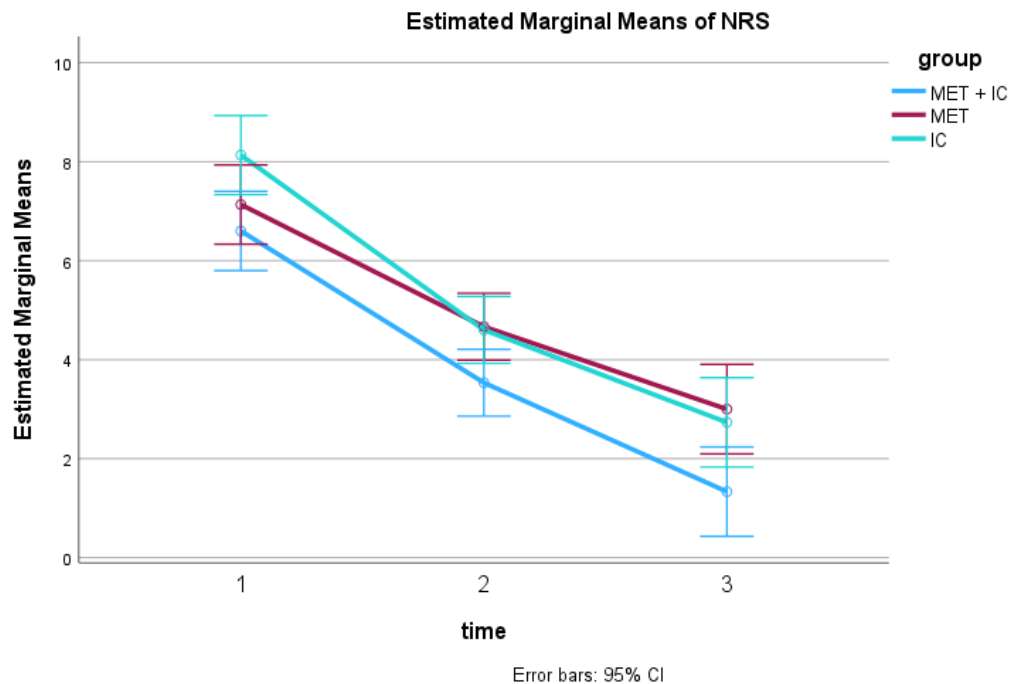
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	2902.785	1	2902.785	588.150	<0.001
group	45.926	2	22.963	4.653	0.015
Error	207.289	42	4.935		



### Total disability

This was measured at two time points, pre and days after the intervention. There was no interaction between time and treatment group for this outcome ( $p=0.387$ ). This means that all treatment groups experienced a significant decrease over time (effect of time  $p<0.001$ ) but this was not dependent on treatment. The group effect was  $p=0.387$ . Therefore type of treatment did not influence total disability score change and all groups did equally well. This is shown by the parallel profiles in the plot.

### Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.520	45.448 <sup>b</sup>	1.000	42.000	<0.001
	Wilks' Lambda	0.480	45.448 <sup>b</sup>	1.000	42.000	<0.001
	Hotelling's Trace	1.082	45.448 <sup>b</sup>	1.000	42.000	<0.001
	Roy's Largest Root	1.082	45.448 <sup>b</sup>	1.000	42.000	<0.001
	Root					
time * group	Pillai's Trace	0.044	0.970 <sup>b</sup>	2.000	42.000	0.387
	Wilks' Lambda	0.956	0.970 <sup>b</sup>	2.000	42.000	0.387
	Hotelling's Trace	0.046	0.970 <sup>b</sup>	2.000	42.000	0.387
	Roy's Largest Root	0.046	0.970 <sup>b</sup>	2.000	42.000	0.387
	Root					

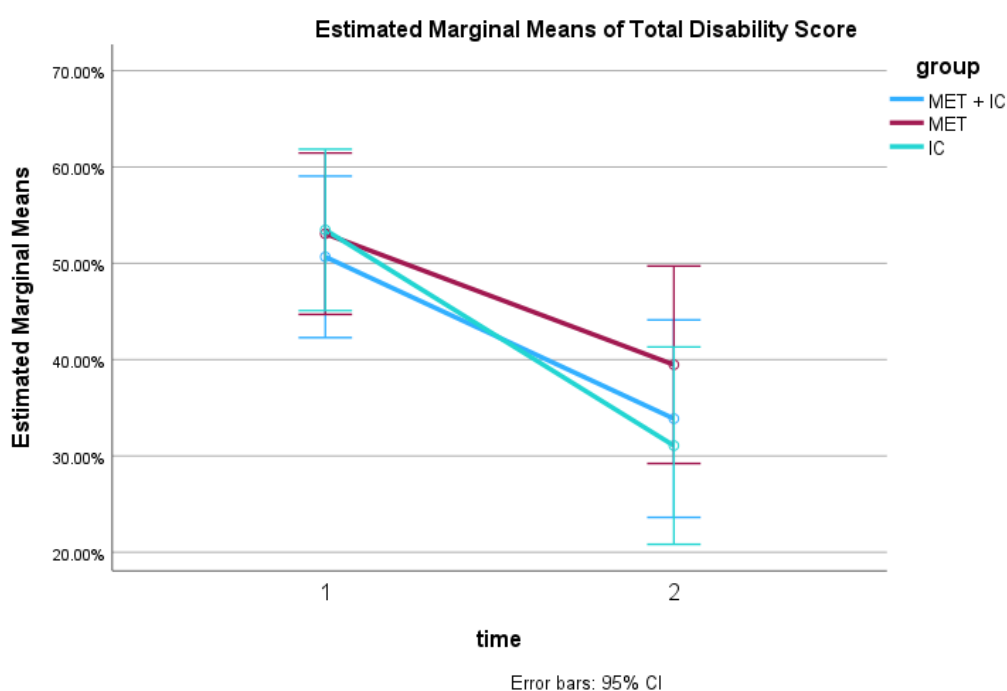
a. Design: Intercept + group  
Within Subjects Design: time

b. Exact statistic

### Tests of Within-Subjects Contrasts

Measure: MEASURE\_1

Source	time	Type III Sum of Squares	df	Mean Square	F	Sig.
time	Linear	6969.600	1	6969.600	45.448	<0.001
time * group	Linear	297.600	2	148.800	0.970	0.387
Error(time)	Linear	6440.800	42	153.352		



### Emotional disability

There was an interaction between time and treatment group for this outcome ( $p=0.030$ ). This means that all treatment groups did not experience the same decrease in scores over time. Therefore type of treatment did influence emotional disability score change and all groups did not do equally well. This is shown by the non parallel profiles in the plot. MET group did not decrease at the same rate over time as the other two groups, and lagged slightly behind at end of follow up.

### Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.423	30.849 <sup>b</sup>	1.000	42.000	<0.001

	Wilks' Lambda	0.577	30.849 <sup>b</sup>	1.000	42.000	<0.001
	Hotelling's Trace	0.734	30.849 <sup>b</sup>	1.000	42.000	<0.001
	Roy's Largest Root	0.734	30.849 <sup>b</sup>	1.000	42.000	<0.001
time * group	Pillai's Trace	0.154	3.831 <sup>b</sup>	2.000	42.000	0.030
	Wilks' Lambda	0.846	3.831 <sup>b</sup>	2.000	42.000	0.030
	Hotelling's Trace	0.182	3.831 <sup>b</sup>	2.000	42.000	0.030
	Roy's Largest Root	0.182	3.831 <sup>b</sup>	2.000	42.000	0.030

a. Design: Intercept + group  
Within Subjects Design: time

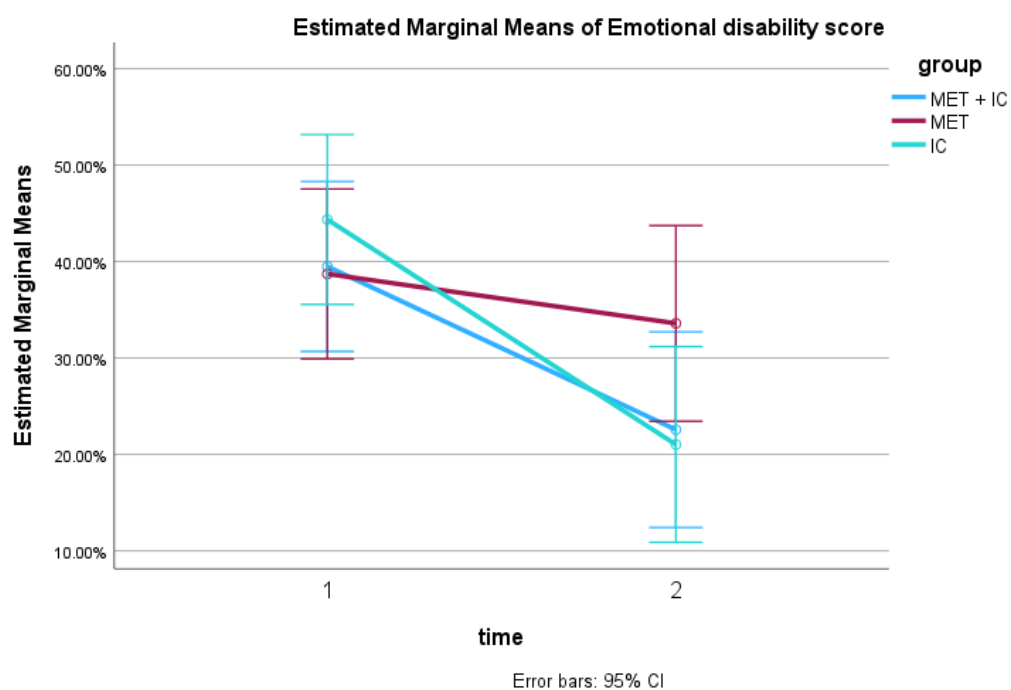
b. Exact statistic

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	99743.754	1	99743.754	200.268	<0.001
group	410.585	2	205.293	0.412	0.665
Error	20918.146	42	498.051		



### Functional disability

There was no interaction between time and treatment group for this outcome ( $p=0.610$ ). This means that all treatment groups experienced a significant decrease over time (effect of time  $p<0.001$ ) but this was not dependent on treatment. The group effect was  $p=0.322$ . Therefore type of treatment did not influence functional disability score change and all groups did equally well. This is shown by the parallel profiles in the plot.

### Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	0.623	69.521 <sup>b</sup>	1.000	42.000	<0.001
	Wilks' Lambda	0.377	69.521 <sup>b</sup>	1.000	42.000	<0.001
	Hotelling's Trace	1.655	69.521 <sup>b</sup>	1.000	42.000	<0.001
	Roy's Largest Root	1.655	69.521 <sup>b</sup>	1.000	42.000	<0.001
time * group	Pillai's Trace	0.023	0.501 <sup>b</sup>	2.000	42.000	0.610
	Wilks' Lambda	0.977	0.501 <sup>b</sup>	2.000	42.000	0.610
	Hotelling's Trace	0.024	0.501 <sup>b</sup>	2.000	42.000	0.610
	Roy's Largest Root	0.024	0.501 <sup>b</sup>	2.000	42.000	0.610

a. Design: Intercept + group  
Within Subjects Design: time

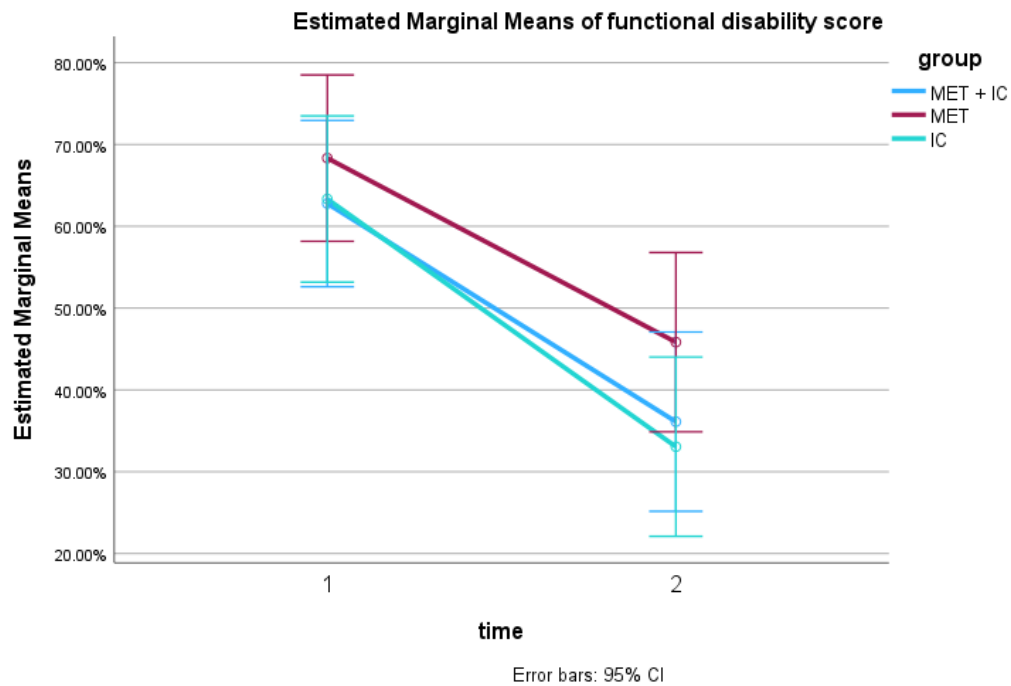
b. Exact statistic

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	239389.660	1	239389.660	401.580	<0.001
group	1389.275	2	694.637	1.165	0.322
Error	25037.037	42	596.120		



### Summary and conclusion

All three treatments were effective for all outcomes measured. However, for emotional disability, the combination treatment or IC alone was more effective than MET alone. For all other outcomes, the treatment given did not affect the outcome result, and all treatments were equally effective.