



# THE EFFECTS OF INTRADIALYTIC EXERCISE PLUS MUSIC ON ANXIETY

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## INTRODUCTION

Hemodialysis (HD) patients experience high levels of anxiety, especially during dialysis treatment, affecting their quality of life negatively. Studies have shown that both exercise training and listening of music can reduce stress in diseased individuals. In our previous study, a 6-month combination of intradialytic exercise and music was found to improve the cardiac autonomic disturbances significantly.

## AIM

The aim of this study was to investigate the effectiveness of a short-term intradialytic exercise program, accompanied with music of preference on the levels of anxiety in HD patients. The originality of the study consists in that we examined the effect of the combination of exercise and listening to music during HD in stress measured both subjectively and objectively.

## METHODS

### PATIENTS

#### Inclusion criteria

Age ≥ 20 years old  
Treatment ≥ 6 months on HD therapy  
HD 3d / wk, 4 hours / per session  
Systolic BP ≤ 180 mmHg  
Diastolic BP ≥ 95 mmHg

#### Exclusion criteria

Cognitive or hearing disorders  
Orthopedic problems  
Myocardial infarction at last 6 months  
Unstable angina pectoris  
Antidepressants or psychotropic medications

31 volunteer HD patients  
21 men & 10 women

#### Group A

Intradialytic exercise program and preference music  
Drop out=1  
n=15

#### Group B

Usual HD treatment  
No extra intervention (control group)  
n=15

### Clinical characteristics

Age : 47.1 ± 15.2 yrs      Age : 63.8 ± 9.5 \* yrs  
Years on HD : 7.3 ± 5 yrs      Years on HD : 7.5 ± 6 yrs  
Hb : 11.1 ± 1.5 g/dl      Hb : 11.3 ± 1.3 g/dl

\*p<0.05, thus statistics measures were calculated with adjustments for age

### Intervention program (12 weeks)

Exercise with :      Music during intradialytic exercise program:  
➢ Stationary bicycles      ➢ Patients' preference music  
➢ Strengthening exercises  
3d/wk, 30' - 60'

Intradialytic exercise program with stationary bicycles and strengthening exercises



The dialysis prescription, medications and the level of anemia remained constant during the study.

## MEASUREMENTS

At baseline and the end of the study all patients underwent:

❑ **Six Minute Walking Test (6MWT):** Functional capacity

Assessment of Anxiety:

❑ **State-Trait Anxiety Inventory (STAI):** Subjective measurement of the level of anxiety

❑ **Cooking Hacks' company sensors platform:** Objective measurement of the level of anxiety by Skin Conductance Response



6MWT  
Estimation of functional capacity



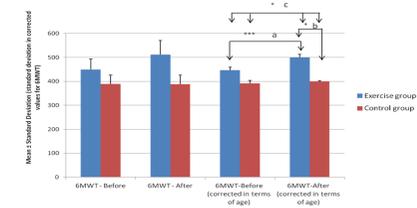
State-Trait Anxiety Inventory (STAI)  
Self-reported psychological inventory pertaining to anxiety affect



Cooking Hacks' sensors platform for Skin Conductance Response

## RESULTS

6MWT variable  
Mean ± standard deviation per group before and after the intervention and corrected values



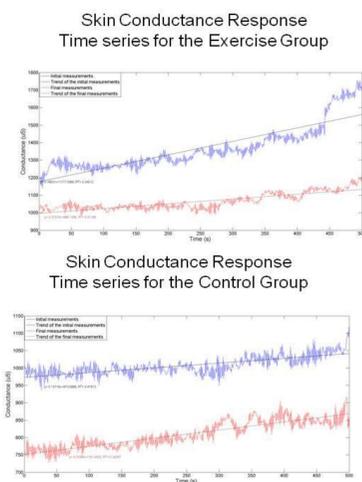
\* p<0.05, \*\*\* p<0.001  
a: Statistically significant change of the Exercise Group  
b: Statistically significant difference between the Exercise Group and the Control Group after intervention  
c: Statistically significant difference in changes between the Exercise and Control Groups

Functional capacity  
6MWT (m)

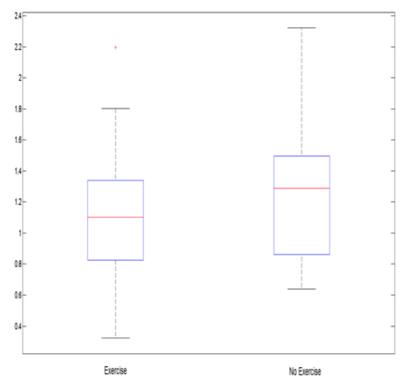
## Anxiety state

### Objective measurement

Cooking Hacks' company sensors platform

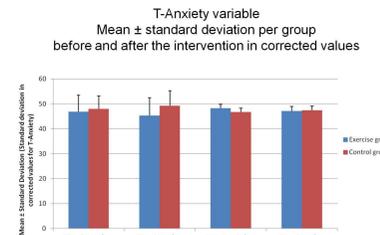
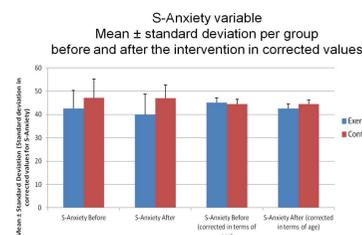


Skin Conductance Response Variations for Exercise and Control Group



### Subjective measurement

STAI Questionnaire



Pearson's correlation coefficient between changes of the variables for the Exercise Group

		6MWT (after - before)	S-Anxiety (after - before)	T-Anxiety (after - before)	Hb (after - before)	Mean (after - before)
6MWT (after - before)	Pearson Correlation	1	0.495	0.498	0.1	-0.137
	Sig. (2-tailed)		0.061	0.059	0.735	0.688
	N	15	15	15	14	11

Although the level of both State and Trait Anxiety was decreased after the 3-month intervention program, there was no statistically significant difference.

There seems to be a correlation between the improvement of functional capacity and the level of anxiety in the trained HD patients.

## CONCLUSIONS

A short-term intradialytic exercise training program accompanied with music of the patients' preference improves their functional capacity, without clearly affecting the level of anxiety in HD patients. Thus, a longer intervention may be required.

## REFERENCES

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