

# Effects of a combined exercise therapy on physical condition, muscle strength, quality of life and serum profiles in type 2 diabetes mellitus

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<b>Registration date</b> 29/04/2010	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 29/04/2010	<b>Condition category</b> Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

**Plain English summary of protocol**  
Not provided at time of registration

## Contact information

**Type(s)**  
Scientific

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## Additional identifiers

## Study information

### Scientific Title

A randomised controlled trial investigating the effects of 12 weeks of combined aerobic and resistance exercise program on serum profiles, functional capacity, isokinetic muscle strength and quality of life type 2 diabetes mellitus

## **Study objectives**

Type 2 diabetes is associated with obesity and physical inactivity and this impairment prevalence is increasing in occidental countries due to the growing predominance of obesity and sedentary life styles. The aim of this study is to analyse the adaptations induced by combined exercise on serum profiles, muscle strength and fatigue, physical fitness, corporal composition and quality of life related with health on type 2 diabetes mellitus patients.

Hypotheses:

1. The combined exercise therapy may lead to improvements in the neuromuscular function, physical fitness, metabolic parameters and health related-quality of life of type 2 diabetes patients.
2. Gains in neuromuscular function are related to improvements in metabolic parameters in patients with type 2 diabetes.
3. Gains in physical fitness are related to changes in health related-quality of life of type 2 diabetes patients.

## **Ethics approval required**

Old ethics approval format

## **Ethics approval(s)**

Ethics committee of health and well being of the University of Évora approved on the 10th of June of 2008 (ref: 08050)

## **Study design**

Single centre interventional randomised controlled trial

## **Primary study design**

Interventional

## **Study type(s)**

Quality of life

## **Health condition(s) or problem(s) studied**

Type II diabetes mellitus

## **Interventions**

The supervised exercise therapy consisted of 1 hour-session for 3-times/week and for 12-weeks. Each session included

1. 10 minutes of warming up with slow walks and easy movements of progressive intensity
2. 25 minutes of aerobic exercises at 60-65% of maximal heart rate
3. 15 minutes of strength exercises with lower and upper limb using patient's own weight resistance, light

loads (e.g. 2-4 sets of 10 repetitions of unilateral knee flexion-extension at a slow pace with the body in a vertical position or of raising the arms over the head holding a stick)

4. 10 minutes of overall mobility and cooling down.

Patients heart rate was monitored using a pulse-meter.

During this 3-month period, participants in the control group (CG) continued their daily activities, with no physical exercise similar to those in the therapy. There was no follow-up beyond the end of the 3 month intervention period.

## **Intervention Type**

Other

## **Phase**

Not Applicable

## **Primary outcome(s)**

The primary endpoint with respect to efficacy of the combined exercise therapy in type-2 diabetes patient was to produce a moderate decrease in serum glycated hemoglobine (HbA1c) levels. Therefore, this parameter was measured from fasting blood samples along others, such as fasting glucose, HDL and LDL cholesterol, triglycerides, alanino aminotransferase (ALT) and aspartate aminotrasnferase (AST) in a standardized manner at laboratories of the hospital of the city of Évora (Portugal).

Measurements were made at baseline and post-intervention at 12 weeks.

## **Key secondary outcome(s)**

1. Muscle condition: maximal peak force of the knee extensors and flexors was recorded by using the Biodex System-3 Isokinetic Dynamometer (Biodex Corp., Shirley, NY, USA). Each subset performed biolateral tests of maximal isokinetic leg strength and leg muscle fatigue.

2. Health-related quality of life (HRQOL), measured using the Portuguese language version of the Short Form 36 Health Survey (SF-36)

3. Body composition: percentage fat, total and abdominal, were assessed using dual-energy X-ray absorptiometry (DXA, Norland Excell Plus, Norland Inc, Fort Atkinson, USA)

4. Functional capacity of the patients, assessed by several tests, performed in a standardized manner:

4.1. Maximal walking speed test over 10 metres

4.2. 10-stairs climbing test

4.3. 10-stairs climbing test carrying a bag weighing 5 kg in each hand

4.4. Timed up and go test

4.5. 30 seconds chair stand test

4.6. 6-minutes walking test

Measurements were made at baseline and post-intervention at 12 weeks.

## **Completion date**

21/12/2008

## **Eligibility**

### **Key inclusion criteria**

1. Non-smokers and not consumers of alcohol

2. Either sex

3. Age between 30 and 70 years

4. At least 3 years with diagnosed type-2 diabetes mellitus

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Adult

**Sex**

All

**Key exclusion criteria**

Presence of any disorders that might prevent physical training load and require other psychological, physical or nutritional therapy

**Date of first enrolment**

10/09/2008

**Date of final enrolment**

21/12/2008

## Locations

**Countries of recruitment**

Portugal

**Study participating centre**

S/ Reguentos de Monsaraz, 44

Évora

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## Sponsor information

**Organisation**

University of Évora (Portugal)

**ROR**

<https://ror.org/02gyps716>

## Funder(s)

**Funder type**

University/education

**Funder Name**

University of Évora (Portugal)

# Results and Publications

Individual participant data (IPD) sharing plan

**IPD sharing plan summary**

Not provided at time of registration