

# A whole-body vibration program in type 2 diabetic patients

<b>Submission date</b> 06/06/2013	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered
		<input type="checkbox"/> Protocol
<b>Registration date</b> 01/11/2013	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
<b>Last Edited</b> 01/11/2013	<b>Condition category</b> Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Diabetes is one of the most prevalent non-communicable diseases worldwide. Treatment methods are usually focused to control blood glucose levels in order to prevent long-term diabetes complications such as retinopathy (damage to the retina of the eye), nephropathy (damage to the kidneys) or neuropathy. However, despite treatment, exercise and nutritional control, a large number of patients develop these complications. Neuropathy is considered an important complication in diabetic patients involving loss of sensitivity (especially at foot level). Diabetic neuropathy is considered a health priority because of the high risk to develop diabetic foot. Moreover, sensitivity loss has been identified as an important predictor of reduced postural control, imbalance and fall risk. Hence, to investigate the effects of treatments on structural and functional components of sensitivity loss could provide useful information for doctors to manage neuropathic problems in primary care, especially in populations with a high risk of developing neuropathy, such as diabetic patients.

On the other hand, despite traditional consideration about the harmfulness of mechanical vibration exposure, during the last decades research has shown positive effects of mechanical vibration on health. In those studies and reviews, the term whole-body vibration (WBV) has been used to refer to a type of training which consists of standing over vibratory devices which transmit mechanical vibrations to the body, producing several adaptation processes at different structural and functional levels. Most of these studies have been conducted to observe the effects of whole-body vibration on physical fitness parameters, important clinical outcomes for some health conditions or health-related quality of life measures in several populations (adults, elderly, athletes, etc.). However, few studies have investigated the effect on sensitivity parameters.

The main aim of this study is to test the effect of a whole-body vibration program on HbA1c (the amount of glucose that is being carried by the red blood cells in the body) and vibration threshold in diabetic type 2 patients.

### Who can participate?

Men and women diagnosed with type 2 diabetes aged from 40 to 85 years old.

### What does the study involve?

Participants will be randomly allocated to either the experimental group or the placebo group.

The experimental group will undergo 24 sessions of whole-body vibration of 15 minutes per session , three times per week over two months.

The placebo group will undergo 24 sessions of false sub-threshold vibrations (hidden speakers) of 15 minutes per session, three times per week over two months.

What are the possible benefits and risks of participating?

The possible benefits are decreases in HbA1c and vibration threshold.

The possible risks of whole-body vibration include back pain, fatigue and soreness.

Where is the study run from?

Primary Care Center, Manuel Encinas, Spain.

When is the study starting and how long is it expected to run for?

The study started in April 2013 and ran until the start of October 2013.

Who is funding the study?

FundeSalud and Research Group on Physical Activity, Health and Quality of Life (Grupo de investigación en Actividad Física, salud y Calidad de Vida) (AFYCAV), Spain

Who is the main contact?

Prof. Narcis Gusi

## Contact information

### Type(s)

Scientific

### Contact name

Prof Narcis Gusi

### Contact details

Av. de la Universidad s/n

Faculty of Sport Science

Caceres

Spain

10003

## Additional identifiers

### Protocol serial number

1

## Study information

### Scientific Title

Cost-effectiveness of a whole-body vibration program in patients with type 2 diabetes

### Study objectives

1. A whole-body vibration program is safe and effective to decrease glycosylated hemoglobin (HbA1c) and vibration threshold in diabetic type 2 patients.

2. A whole-body vibration program is effective to decrease body mass index, fat percentage, blood pressure and lipidic profile in diabetic type 2 patients.
3. A whole-body vibration program is effective to improve strength, balance and health related quality of life in diabetic type 2 patients.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Biomedical Ethical Committee of the University of Extremadura, 09 October 2012, ref: 44/2012

### **Study design**

Randomised controlled trial

### **Primary study design**

Interventional

### **Study type(s)**

Treatment

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

Diabetes type 2

### **Interventions**

Two groups: Experimental group and placebo group.

Experimental group: 24 sessions of whole-body vibration of 15 minutes per sessions, three times per week during 2 months.

Placebo group: 24 sessions of a false sub-threshold vibrations (hidden speakers) of 15 minutes per sessions, three times per week during 2 months.

### **Intervention Type**

Other

### **Phase**

Not Applicable

### **Primary outcome(s)**

1. HbA1c. Measured with laboratory blood analysis at baseline and two months.
2. Vibration threshold. Measured with biothesiometer (vibraton II) at baseline, acute effects, one month and two month.

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

1. Health related quality of life. Measured with EQ-5D-5L; SF-12; 15-D, Diabetes Quality of Life Measure (DQOL) and Foot Health Status Questionnaire (FHSQ). Measured at baseline and two months.
2. Balance. Measured with plate force (Romberg test open and closed eyes), Time and Go test (TUG). Measured at baseline and two months.
3. Strength. Measured with Chair and stand test, BMI, Tilts and stadiometer (Soehnle professional). Measured at baseline and two months.

4. Muscular and Fat percentage. Measured with impedance meter (Tanita) at baseline and two months.
5. Blood pressure. Measured with doppler at baseline and two months.
6. Lipidic profile. Measured with laboratory blood analysis at baseline and two months.
7. Diabetic neuropathy. Measured with Michigan Neuropathy Screening Instrument and monofilament at baseline and two months.
8. Body mass index (BMI). Measured at baseline and two months.

**Completion date**

04/10/2013

## Eligibility

**Key inclusion criteria**

1. Male and female, 40 to 85 years old, diagnosed with type 2 diabetes
2. Agreement to volunteer for the study by giving a written informed consent

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Sex**

All

**Key exclusion criteria**

1. Contraindications to high intensity exercise participation:
  - 1.1. Retinopathy
  - 1.2. Musculoskeletal limitations
  - 1.3. Severe balance impairments
  - 1.4. High risk of thrombosis
2. Psychotropic and neurotoxic drugs intake
3. Exposure to neurotoxins (industrial accidents, contact with toxic dumps)
4. Radiotherapy treatment
5. High risk of non-diabetic neuropathy (AIDS, uremia, alcoholism)
6. People who have or have had a job with high exposure to whole-body mechanical vibration
7. Individuals undergoing or have completed a whole-body vibration program

**Date of first enrolment**

08/04/2013

**Date of final enrolment**

04/10/2013

## Locations

**Countries of recruitment**

Spain

**Study participating centre**

Av. de la Universidad s/n

Caceres

Spain

10003

## Sponsor information

**Organisation**

University of Extremadura (Spain)

**ROR**

<https://ror.org/0174shg90>

## Funder(s)

**Funder type**

Government

**Funder Name**

FundeSalud (Spain) (DIAB02/2012)

**Alternative Name(s)**

Foundation for Research and Training of Health Professionals of Extremadura, FundeSalud

**Funding Body Type**

Government organisation

**Funding Body Subtype**

Local government

**Location**

Spain

**Funder Name**

Research Group on Physical Activity, Health and Quality of Life (Grupo de investigación en Actividad Física, salud y Calidad de Vida) (AFYCAV) (Spain)

# Results and Publications

Individual participant data (IPD) sharing plan

**IPD sharing plan summary**

Not provided at time of registration