

VIII SIMPOSIO INTERNACIONAL DE ACTUALIZACIONES EN ENTRENAMIENTO DE LA FUERZA

VIII International Symposium in Strength Training

Editores/Editors: Pedro J. Benito, Ana B. Peinado, Iván Gonzalo &
Francisco J. Calderón



UNIVERSIDAD POLITÉCNICA DE MADRID
Facultad de Ciencias de la Actividad Física y del Deporte-INEF
Departamento de Salud y Rendimiento Humano

NSCA-Spain

VIII International Symposium in Strength Training
December 11-12, 2015

Diciembre 2015,

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Pedro J. Benito,
Ana B. Peinado,
Iván Gonzalo,
Francisco J. Calderón
<http://www.congresodefuerza.com/>

ISBN:978-84-608-4475-4

Depósito Legal: M-38929-2015

Impreso en España - Printed in Spain
Reproconsulting S. L.
28040 Madrid

7. Changes on bone mineral density after a body weight loss program.

Rojo-Tirado, M.A.¹, Benito, P.J.¹, on behalf of PRONAF Study Group.

¹ Facultad de Ciencias de la Actividad Física y del Deporte - INEF, Universidad Politécnica de Madrid (España).

Background: Body weight is directly associated with bone mass and obese adults usually have higher bone mineral density (BMD) (Villareal, Apovian, Kushner, & Klein, 2005). Body weight loss, especially via energy restriction, has been observed in numerous studies (Jensen, Quaade, & Sorensen, 1994; Pritchard, Nowson, & Wark, 1996; Villareal et al., 2006) to be associated with bone loss (Pritchard, et al., 1996; Reid, 2002). Therefore, maintenance of BMD after weight loss is extremely important to maintain bone integrity and avoid fracture. The objective was to compare the changes on bone mineral density after a 6-months body weight loss program based on calorie restriction and exercise.

Methods: One hundred and eighty overweight and obese people (body mass index: 30.5 ± 2.6 kg/m²), aged 18-50 years, participated in the study (84 men, 96 women) during 6 months. Four types of treatments were randomly assigned: strength training (S), endurance training (E), strength and endurance training (SE), and control group (C). All participants followed a 25-30% caloric restriction diet. Two-way ANOVA with repeated measures was used to compare the changes on bone mineral density among the different intervention groups. The level of significance was set at 0.05.

Results: A significant interaction moment X group was revealed ($F_{3,171}=2.675$; $p=0.049$). S group reduced its BMD by -0.008 ± 0.003 g/cm² ($p=0.005$), while E, SE and C maintained it unaltered (-0.004 ± 0.002 g/cm² [$p=0.073$], 0.002 ± 0.003 g/cm² [$p=0.349$], and -0.001 ± 0.003 g/cm² [$p=0.647$], respectively) after the body weight loss program.

Conclusion: The results show that the inclusion of physical exercise in weight loss programs does not ensure the maintenance or improvement of BMD, since the S group, with low impact, decreased its BMD.

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Correspondence address (Presenting author):

Dr. Miguel Ángel Rojo Tirado
Facultad de Ciencias de la Actividad Física y del Deporte - INEF.
Universidad Politécnica de Madrid.
C/ Martín Fierro nº7.
28040 Madrid.
913364070
ma.rojo@upm.es