

the lowest level. The same inversely association was observed in *European girls* between FAS and WHtR, ( $p=0.0112$ ) that showed 0.43 when they had the highest level of FAS and, 0.44 when the level was the lowest. However, this association was not observed between FAS and WC. Similarly, the inverse association was observed in *European girls*, when evaluating the relationship between parental education and WC. On the highest level of mother's education, WC was 69.3 cm ( $p=0.0099$ ) and for father's education was 69.2 cm ( $p=0.0014$ ). There was not any association in boys and when considering parent's occupation.

**Conclusions.** In European adolescent girls, abdominal obesity (WC and WHtR) was associated with the education levels of the parents. Health promotion programs aiming to reduce abdominal obesity should give special consideration to low education level families.

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### Efectos de diferentes tipos de ejercicio físico aeróbico con intervención nutricional en la tensión arterial, masa y composición corporal y condición cardiorespiratoria en personas con sobrepeso e hipertensión primaria: estudio preliminar

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**Palabras clave:** Hipertensión arterial; Intensidad alta; Interval; Intensidad moderada; Dieta hipocalórica; Consumo de oxígeno pico

**Objetivo.** Comparar los efectos de dos programas de ejercicio físico (EF) aeróbico (continuo de intensidad moderada y alto volumen vs. interválico de alta intensidad y bajo volumen) en la masa y composición corporal, presión arterial (PA) y condición cardiorespiratoria en pacientes adultos con sobrepeso u obesidad e hipertensión primaria tratados con dieta hipocalórica; con los efectos mediante tratamiento único con dieta hipocalórica.

**Métodos.** Se tomaron mediciones de masa y composición corporal, PA y prueba pico ergoespirométrica a 31 participantes ( $56 \pm 9$  años) antes y después de 16 semanas de intervención. De forma aleatoria se repartieron en tres grupos paralelos: GC ( $n=11$ ), grupo control con tratamiento único con dieta hipocalórica (25% restricción energética) y recomendaciones de estilo de vida saludable; GEC ( $n=10$ ), grupo de EF supervisado (2 días/sem) en modo continuo a intensidad moderada (60-80% FCpico), alto volumen (45 min) y dieta hipocalórica; y GEI ( $n=10$ ), grupo de EF supervisado (2 días/sem) en modo interválico a intensidad alta (85-95% FCpico), bajo volumen (20 min) y dieta hipocalórica.

**Resultados.** Comparando antes vs después de la intervención se observaron descensos ( $P<0,05$ ) en todos los grupos del estudio en la masa corporal, masa grasa y PA media (PAM). Sin

EF supervisado (GEC: 25,6 vs 29,4 mL.kg<sup>-1</sup>.min<sup>-1</sup>,  $P=0,005$ ; 7,3 vs 8,4 METS,  $P=0,03$ ; GEI: 21,6 vs 27,0 mL.kg<sup>-1</sup>.min<sup>-1</sup>,  $P=0,009$ ; 6,2 vs 7,7 METS,  $P=0,02$ ), y sin cambios significativos en GC (22,1 vs 25,1 mL.kg<sup>-1</sup>.min<sup>-1</sup>,  $P=0,1$ ; 6,7 vs 7,2 METS,  $P=0,2$ ).

**Conclusiones.** Tanto un tratamiento único con dieta hipocalórica como combinado con EF aeróbico consiguen reducir la masa y grasa corporal y PA en reposo en pacientes con hipertensión y sobrepeso. Sin embargo, solamente el tratamiento combinado (dieta + EF) consigue mejoras añadidas en la condición cardiorespiratoria, lo que se asocia a una reducción del riesgo de enfermedad cardiovascular. El protocolo de EF aeróbico de alta intensidad y bajo volumen podría resultar más efectivo con incrementos superiores de las variables cardiorespiratorias, concluyendo que "menos" puede ser "más". Estos resultados son preliminares precisando confirmación con un mayor tamaño muestral.

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### Associations between patterns of active commuting and socioeconomic factors in women with fibromyalgia: the al-Ándalus Project

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**Keywords:** Active transportation; Chronic pain; Social-economic factors

**Background.** Fibromyalgia is associated with a debilitated physical function, which limits activities of daily living. Active commuting might be a way of increasing physical activity levels. Understanding potential social-economic factors associated to active commuting are necessary to promote strategies aiming at increasing physical activity behaviours.

**Objective.** The aims were: to compare the patterns of commuting between fibromyalgia women and healthy women; and to examine the associations between active commuting and socioeconomic factors in fibromyalgia women.

**Method.** This cross-sectional study included a total of 459 women satisfying the 1990 American College of Rheumatology criteria and 214 healthy women from Andalusia. Active commuting to local shops, supermarket, local facilities and work/study place were assessed by mode of commuting questionnaire. Active commuter and active worker commuter dichotomous variables were created. Civil status, accompaniment at home, living with, educational level, current occupational status and professional status were assessed by socioeconomic factors questionnaire. Differences between fibromyalgia and healthy women on the patterns of commuting were performed using the Chi-square test. Associations between active commuting and social-economic factors were performed using binary logistic regression.

**Results.** No differences in the percentage of active commuters were observed between fibromyalgia and control women (69 vs. 73%). The percentage of active workers commuters did not vary between the fibromyalgia and control groups (71 vs. 67%). Differences in the percentage of active commuting to supermarket were observed between fibromyalgia and controls (46 vs. 56%,  $p=0.020$ ,

respectively). Those fibromyalgia women who lived alone were more actively commute than those who lived accompanied (OR: 4.7, 95%CI: 1.4-15.6,  $p=0.013$ ) and those who lived with both partner and children, only partner and or children (ORs: 4.3, 95%CI: 1.3-14.7,  $p=0.020$ ).

**Conclusion.** Fibromyalgia and control women showed a similar pattern of active commuting behaviours. Additionally, fibromyalgia patients without family demands were more active commuters than control women.

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### Underreporting of energy intake in an athlete adolescent population

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**Keywords:** Underreporters; swimmers; BMI; body fat; macronutrients

**Objective.** To assess the extent of under reporting (UR) in a group of adolescent swimmers (SWI) compared to normo-active adolescents (CON) and investigate associated variables for each group.

**Methods.** A total of 80 SWI (37 females;  $14.3 \pm 1.8$  y) and 60 CON (23 females;  $14.4 \pm 2.7$  y) were evaluated. Weight, height and waist circumference (WC) were measured and body mass index (BMI) was calculated. Percentage of body fat (BF%) was calculated with Slaughter equation. Socioeconomic status was registered with a questionnaire. Contribution of macronutrients to energy intake (EI) was registered by two 24hour dietary recalls. UR was identified according to the Goldberg criterion adapted to adolescents. Pearson correlations between UR and the mentioned variables were performed. Multiple linear regressions investigated the associations between UR and the correlated variables (BMI, %BF and WC separately included to avoid colinearity).

**Results.** Rates of UR were 19.6% and 2.9% in male and female CON respectively; and 24% and 23.3% in male and female SWI respectively, with significant differences between males and females CON and between SWI and CON females ( $p<0.05$ ). In male CON, BMI (0.37; CI 0.01, 0.11) and BF% (0.34; CI 0.00, 0.04) were positively related to UR and contribution of lipids to EI was negatively related to UR in BMI (-0.50; CI -0.05,-0.01), WC (-0.48; CI -0.05,-0.00) and BF% (-0.44, CI -0.05,-0.00) independent models. In male SWI, BMI (0.33; CI 0.00, 0.10) and WC (0.30; CI 0.00, 0.05) were positively related to UR. In female SWI, contribution of proteins to EI (0.41; CI 0.01, 0.06) was positively related to UR.

**Conclusion.** In female CON, the low percentage of UR makes difficult to draw conclusions. High BMI shows to be related to UR in males independently of physical activity level. However, athletes and CON show different dietary patterns when UR.

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### The influence of different playing surfaces on bone mineral density in pubertal soccer players

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**Keywords:** Soccer; Pitch; Artificial turf; Natural grass; Bone mass

**Introduction.** Soccer is one of the most practiced sports in the world. It is characterized by different actions such as changes of directions, starts, stops, jumps and kicks, so it has been defined as an osteogenic sport. Previous studies have demonstrated that soccer participation improves bone mineral density (BMD) in male children. However, the influence that different playing surfaces could have on bone properties has not been studied in depth. Therefore, the aim of this study was to evaluate BMD differences between male soccer players who train on different playing surfaces.

**Methods.** A total of 76 male soccer players ( $12.7 \pm 0.6$  y) participated in this study. They were divided into 4 groups depending on the type of surface they played on as follows: 18 soccer players who trained in natural turf (NT), 13 in natural non-grass turf (NGT), 27 in 2nd generation artificial turf (2AT) and 18 in 3rd generation artificial turf (3AT). BMD and lean mass were measured with Dual-energy X-ray absorptiometry. Multivariate analysis of covariance (MANCOVA) test using age, height, Tanner stage and subtotal body lean mass (whole body less the head) as covariates was used to analyze differences in BMD variables by playing surface.

**Results.** 3AT soccer players showed higher subtotal body, left leg, right leg and femoral neck BMD than players who trained in 2AT ( $p<0.05$ ). 3AT soccer players also showed higher right leg BMD than those training in NT ( $p<0.05$ ). Moreover femoral neck BMD was higher in 3AT soccer players than players who trained in NGT ( $p<0.05$ ). Others groups did not show differences between them ( $p>0.05$ ).

**Conclusions.** Soccer participation in 3AT might affect positively bone development during puberty. Despite these results, it would be necessary to analyze other variables, which could modify bone properties as calcium intake and the volume and type of soccer training.

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### Relationship between overall physical fitness and cardiovascular disease risk factors in Spanish pubertal soccer players

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