

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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