

Nutritional and Physiological Profiles of Adolescent Athletes in Hong Kong

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Purpose Nutrition plays an important role in exercise performance. However, there is a paucity of information on nutritional status and physiological profile of Hong Kong adolescent athletes. The purpose of this study was to assess the nutritional and physiological profiles of a group of adolescent athletes and compare with non-athlete adolescents in Hong Kong.

Method Adolescent athletes (n = 27; male = 13, female = 14; age = 12 - 17) and a group of non-athlete adolescents (n = 14; male = 9; female = 5) were recruited for this study. Lean body mass (LBM), percent of fat mass (%FM), and bone mineral density (BMD) were measured by dual-energy x-ray absorptiometry (DXA). Dietary data were collected by seven-day self-reported food record. A series of blood biochemical markers such as red blood cell (RBC), white blood cell (WBC), hemoglobin (Hb), hematocrit (Hct), mean corpuscular volume (MCV), red cell distribution width (RDW), platelet (Plt), ferritin (Ferr), triglyceride (TG), total cholesterol (TC), high-density lipoprotein (HDL) and low-density lipoprotein cholesterol (LDL) were measured and calculated.

Result LBM in all athletes were significantly higher than non-athletes (male athletes: 55.3 ± 7.8 kg vs. male non-athletes: 51.9 ± 4.8 kg; female athletes: 40.2 ± 4.4 kg vs. female non-athletes: 33.6 ± 6.8 kg, p -value < 0.05) and %FM was significantly lower (male athletes: $11.5 \pm 1.8\%$ vs. male non-athletes: $17.8 \pm 5.6\%$; female athletes: $18.6 \pm 2.9\%$ vs. female non-athletes: $28.2 \pm 5.5\%$, p -value < 0.05). No difference was found in the BMD of male athletes and non-athletes, but female athletes' BMD was significantly higher than female non-athletes (female athletes: 1.04 ± 0.06 g/cm² vs. female non-athletes 0.90 ± 0.11 g/cm², p -value < 0.05). Athletes were found to have a significantly higher mean energy

intake than non-athletes in both genders (male athletes $3,181 \pm 505$ kcal/day and male non-athletes $2,024 \pm 325$ kcal/day, p -value < 0.001; female athletes $2,347 \pm 527$ kcal/day and female non-athletes $1,635 \pm 302$ kcal/day, p -value < 0.05). Cholesterol intake in male athletes (619.9 ± 327.2 mg/day) more than doubled that of the recommended value from the American Heart Association (300 mg/day). Both athletes' and non-athletes' fibre intakes were below recommendation but athletes had significantly higher fibre intake than non-athletes (male athletes: 17.1 ± 5.3 g/day vs. male non-athletes: 6.5 ± 2.2 g/day; female athletes: 14.3 ± 4.5 g/day vs. female non-athletes: 5.7 ± 1.4 g/day, p -value < 0.001). Mean micronutrient intakes in athletes met the recommendation with the exception of calcium (Ca) (male athletes: $1,059.8 \pm 461.1$ mg/day, female athletes: 873.5 ± 327.5 mg/day), but male non-athletes only met recommendation for thiamin, riboflavin, niacin, vitamin B12 and iron. Female non-athletes only met recommendation for thiamin. Ca intakes in non-athletes (male non-athletes: 299.7 ± 88.0 mg/day, female non-athletes: 242.0 ± 77.4 mg/day) were less than one-quarter of recommended intake of 1,300mg/day. Athletes also had a significantly higher Ca intake than non-athletes (p -value < 0.05). Blood parameters were all within normal ranges.

Conclusion Although athletes had better nutritional profile than non-athletes, cholesterol, Ca and fibre intakes need improvement in order to meet the recommendations. Adolescents in Hong Kong need to improve dietary intakes of micronutrients, fibre and particularly Ca in order to ensure adequate nutrients for growth and optimal bone accretion. This study showed that there is a positive association among sport participation, nutrient intake and physical characteristics of adolescents in Hong Kong.

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