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The dietary patterns and double burden of malnutrition in Mexican adolescents: Results from the National Survey of Health and Nutrition (ENSANUT-2006).

Introduction: Mexico faces the double burden of malnutrition, characterized by the coexistence of micronutrient deficiencies and non-communicable diseases, and adolescents are not an exception. Adolescents'eating behaviour may be influenced by sociodemographic characteristics such as socioeconomic level, education level, ethnicity and gender. The dietary habits established during adolescence tend to persist during adulthood. Furthermore, dietary patterns adopted during this stage may contribute to health outcomes later in life. Therefore, the primary aim of this study was to describe dietary patterns of Mexican adolescents in 2006 using Principal Component Analysis (PCA), and to examine the association between the identified dietary patterns and adolescents'nutritional status.

Methods: A sample of 7,670 Mexican adolescents aged 12-19 years old from the National Survey of Health and Nutrition (ENSANUT-2006) was analysed. The data comprises dietary, anthropometric, and hemoglobin information. Dietary intake was assessed by a 7-day Food Frequency Questionnaire (7d-FFQ), and the dietary patterns were derived by PCA. The association between dietary patterns and overweight-obesity and anemia was determined by Prevalence Ratio (PR). All the associations were adjusted for sociodemographic characteristics and for energy.

Results: We identified six dietary patterns which explained 36.6% of the total variance: 1) processed food; 2) fruit and vegetables: 3) milk and breakfast cereals: 4) soup, meat and cereals; 5) snacks; and 6) legumes and eggs. High consumption of the "processed food"pattern was positively associated to overweight-obesity (PR 1.09, 95%IC 1.06, 1.13) and to anemia (RP 1.16, 95%IC 1.06, 1.27). Adolescents who scored high for the patterns "milk and breakfast cereals"(RP 0.88, 95% IC 0.81, 0.96), and "fruit and vegetables"(RP 0.88, 95% IC 0.81, 0.96) were at lower risk of anemia compared to those who scored low for these patterns. Overweight-obesity was inversely associated with the high consumption of the pattern "snacks"(RP 0.95, 95%IC 0.92-0.98). This association was diluted after conducting a sensitivity analysis for underreporting.

Conclusion: Our results infer that the consumption of processed food pattern, which is characterized by high content of fat and low content of fiber and micronutrients, seems to be positively associated to the two faces of the double burden of malnutrition. In addition, the consumption of dietary patterns that contain food rich in micronutrients (fruit and vegetables), and micronutrient-fortified food (breakfast cereals) may reduce the risk of anemia. The sensitivity analysis suggested that underreporting may explain the inverse association between the pattern snacks and the prevalence of overweight-obesity. Further longitudinal research are needed to understand the influence of diet on nutritional status.

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