Longitudinal association between body mass index and physical activity among adolescents with different parental risk: a parallel latent growth curve modeling approach

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Abstract

Background Data available on the association between physical activity (PA) and body mass index (BMI) in different periods of life is controversial. Using a parallel latent growth curve modeling (LGCM) approach, the current study aimed to investigate the influence of daily PA on adolescents' BMI over a 12 year follow-up, taking into account their parental risk. Method Participants comprised 1323 adolescents (53.5% girls), aged 12-18 years who had participated in the baseline phase of Tehran Lipid and Glucose Study (TLGS) (2001-2003), and were followed for an average period of 12 years. Physical activity, including leisure time and occupational activities, was assessed using the reliable and validated Iranian version of the Modifiable Activity Questionnaire (MAQ). Weight and height were objectively measured in order to calculateBMI.Atwo-step cluster analysis was conducted to classify parents into two high- and low-risk clusters. Parallel LGCM was fitted to estimate cross-sectional, prospective and parallel associations, which assessed the longitudinal association between simultaneous changes in PA and BMI during the study period. Analyses were stratified by gender and parental clusters. Results A rising trend of BMI per 3 years was observed in boys 1.39 kg.m(2)(95% CI; 1.32, 1.48) and girls 0.9 kg.m(2)(95% CI; 0.82, 0.98), as well as in the low risk 1.11 kg.m(2)(95% CI; 1.03, 1.18) and high-risk 1.12 kg.m(2)(95% CI; 1.03, 1.22) clusters. Moreover, a positive prospective association between PA at baseline and BMI change over the 12 year follow-up, was observed in adolescents in the low-risk parental cluster 0.27(95% CI; 0.14, 0.41) indicating that higher levels of PA at baseline may lead to greater BMI in adolescents over time. However, examining longitudinal parallel association between simultaneous changes of PA and BMI per 3 years revealed adverse associations for adolescents in the low-risk parental cluster - 0.07 (95% CI; - 0.13, - 0.01) and in boys - 0.06 (95% CI; - 0.11, - 0.01). Conclusion Despite a positive prospective association between BMI and PA at baseline, there was a weak inverse parallel association between these variables over time, particularly in boys and adolescents with low parental risk. These findings imply the potential role of other influential factors indetermining adolescents' weight status which need to be considered in the future plannings.

Keywords

Author Keywords: BMI; Physical activity; Parental clusters; Parallel latent growth curve modeling

KeyWords Plus: METABOLIC SYNDROME; IRANIAN CHILDREN; SOCIOECONOMIC-STATUS; WEIGHT CHANGE; OVERWEIGHT; OBESITY; SAMPLE; INTERVENTION; DETERMINANTS; PREVALENCE

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