



ORIGINAL ARTICLE

Socioeconomic status indicators, physical activity, and overweight/obesity in Brazilian children



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Received 17 April 2015; accepted 9 August 2015

Available online 23 October 2015

KEYWORDS

Accelerometry;
Obesity;
Adiposity;
Sedentary lifestyle;
Child

Abstract

Objective: To analyze the associations between socioeconomic status (SES) indicators and physical activity and overweight/obesity in children.

Methods: 485 children wore accelerometers for 7 days. Variables included time in sedentary behavior and moderate-to-vigorous physical activity (MVPA), and steps/day. Children were further categorized as meeting or not meeting guidelines of ≥ 60 min/day MVPA and $\geq 12,000$ steps/day. Body mass index (BMI) and body fat percentage (BF%) were measured using bioelectrical impedance. Overweight/obesity was defined as BMI $>+1$ SD and BF% ≥ 85 th percentile. Parents answered questionnaires that questioned total annual household income, parental education level, parental employment status and automobile ownership.

Results: Children averaged 59.5min/day in MVPA (44.1% met MVPA guidelines), and 9639 steps/day (18.4% met steps/day guidelines). 45.4% and 33% were overweight/obese classified by BMI and BF% respectively. Higher relative total annual household income level (Odds Ratio 0.31; 95% confidence interval=0.15–0.65), and relatively higher maternal (OR=0.38; 95%CI=0.20–0.72) and paternal (OR=0.36; 95%CI=0.17–0.75) education levels were associated with lower odds of children meeting MVPA guidelines. Household automobile ownership was associated with lower odds of children meeting MVPA (OR=0.48; 95%CI=0.31–0.75) and steps/day guidelines (OR=0.44; 95%CI=0.26–0.74).

Conclusions: SES indicators were not associated with overweight/obesity, but higher SES was associated with lower odds of children meeting MVPA guidelines.

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PALAVRAS-CHAVE

Acelerometria;
Obesidade;
Adiposidade;
Estilo de vida
sedentário;
Criança

Indicadores de nível socioeconômico, atividade física e sobrepeso/obesidade em crianças brasileiras**Resumo**

Objetivo: Analisar as associações entre indicadores de nível socioeconômico (NSE) e atividade física e sobrepeso/obesidade em crianças.

Métodos: 485 crianças usaram acelerômetros por 7 dias. As variáveis incluíram o tempo em comportamentos sedentários e atividade física moderada a vigorosa (AFMV), e passos/dia. As crianças foram ainda classificadas como satisfazendo ou não o cumprimento das diretrizes de ≥ 60 min/dia MVPA e ≥ 12.000 passos/dia. Índice de massa corporal (IMC) e percentual de gordura corporal (%GC) foram medidos através de impedância bioelétrica. Sobrepeso/obesidade foi definido como $IMC > +1SD$ e um $\%GC \geq$ percentil 85. Os pais responderam a questionários que questionavam o rendimento total anual das famílias, o nível de educação dos pais, situação de emprego dos pais e propriedade de automóvel.

Resultados: As crianças mostraram uma média de 59,5 min/dia de AFMV (44,1% atingiram as diretrizes de AFMV), e 9.639 passos/dia (18,4% atingiram as diretrizes de passos/dia). 45,4% e 33% estavam com sobrepeso/obesidade classificada pelo IMC e %GC, respectivamente. Maior nível de renda familiar anual total (*odds ratio* 0,31; intervalo de confiança de 95%=0,15-0,65), e níveis relativamente mais elevados de educação materna ($OR=0,38$; $IC95\%=0,20-0,72$) e paterno ($OR=0,36$; $IC95\%=0,17-0,75$), foram associados com menor chance de crianças atingirem as diretrizes de AFMV. Propriedade de automóvel foi associada com menor chance de crianças atingirem as diretrizes de AFMV ($OR=0,48$; $IC95\%=0,31-0,75$) e diretrizes de passos/dia ($OR=0,44$; $IC95\%=0,26-0,74$).

Conclusões: Os indicadores de NSE não foram associados com sobrepeso / obesidade, mas maior NES foi associado com menor chance de crianças atingirem diretrizes de AFMV.

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Introduction

Regular physical activity is associated with an array of health benefits for children.¹ Unfortunately, the majority of children in Brazil are not sufficiently active. Currently, only 38.6% of boys and 20.1% of girls accumulate the recommended ≥ 60 min/day of moderate-to-vigorous physical activity (MVPA).² Further, the 2009 National Survey of School Health or Brazilian National Survey of School Health (Pesquisa Nacional de Saúde do Escolar – PeNSE) reported that one in three (33.5%) Brazilian children had overweight, and 16.6% of boys and 11.8% of girls were obese.³

Physical activity and overweight/obesity are influenced by complex factors that vary widely between countries.^{4,5} Socioeconomic status (SES) is one of these factors because it influences people's attitudes, experiences, and exposure to several health risk factors.^{2,6} Indeed, SES indicators (e.g., annual household income, parental education level and parental employment status) are related to a variety of chronic diseases in children.^{7,8} Although it has been differentially defined and measured, SES generally displays an inverse relationship with childhood overweight/obesity in developed countries.^{5,9}

For example, in the United States, the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) showed that SES (defined as total annual household income and maternal education) was inversely associated with overweight/obesity [body mass index (BMI) >2 SD z-scores].⁹

Children's lack of physical activity and the high prevalence of overweight/obesity remain a combined challenge in developed countries, and now pose a growing public health threat.¹⁰ Paradoxically, although 80% of the global population is located in developing countries, only a small fraction of research focused on determinants of overweight/obesity and physical activity is conducted in these nations.^{4,11} A Kenyan study reported negative associations between SES indicators (defined as total household annual income, parental education level and public versus private school) and children's accelerometry, determined achievement of MVPA guidelines (defined and a mean of ≥ 60 min/day at ≥ 3000 counts/min).¹² In Brazil, however, Rezende et al.² reported a significant positive association between maternal education level and self-reported physical activity in adolescents.

Given these polar findings, more research is required to understand the relationship between indicators of SES and adequate physical activity and overweight/obesity in children of developing countries. Further, only a few studies have used direct measures of physical activity and overweight/obesity, such as accelerometers or bioelectrical impedance, to examine associations with indicators of SES. Thus, the purpose of this study was to analyze the associations between parent-reported indicators of SES (annual household income, parental education level, parental employment status, and automobile ownership), child's enrollment at public versus private school, and direct

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