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ORIGINAL ARTICLE

Age at menarche in schoolgirls with and without excess weight☆,☆☆

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KEYWORDS
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Abstract
Objective: To evaluate the age at menarche of girls, with or without weight excess, attending private and public schools in a city in Southeastern Brazil.
Methods: This was a cross-sectional study comparing the age at menarche of 750 girls from private schools with 921 students from public schools, aged between 7 and 18 years. The menarche was reported by the *status quo* method and age at menarche was estimated by logarithmic transformation. The girls were grouped according to body mass index (BMI) cut-off points: (thin + normal) and (overweight + obesity). In order to ensure that they belonged to different strata, 328 parents of these schools answered a questionnaire to rate the student's socioeconomic level.
Results: Menarche was reported by 883 girls. Although they belonged to different classes ($p < 0.001$), there was no difference in the nutritional diagnosis ($p = 0.104$) between them. There was also no difference in age at menarche between the girls studying in private (12.1 years, 95% CI: 12.0-12.2) and public schools (12.2 years, 95% CI:12.1-12.3; $p = 0.383$). When evaluated by nutritional status, there was difference only in the age at menarche between girls from private schools with excess weight and without excess weight (11.6 and 12.3 years; $p < 0.001$). The girls with excess weight attending private schools also had earlier an menarche than those attending public schools (respectively, 11.6 and 12.1 years; $p = 0.016$).
Conclusions: Although the students from private schools belonged to a higher socioeconomic status, there is currently no longer a large gap between them and girls from public schools regarding nutritional and socioeconomic factors that may influence the age at menarche.

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PALAVRAS-CHAVE
Menarca;
Adolescente;
Índice de massa corporal

Idade da menarca em escolares com e sem excesso de peso

Resumo
Objetivo: Avaliar a idade da menarca em meninas, com e sem excesso de peso, que frequentam escolas particulares e públicas de uma cidade do sudeste do Brasil.
Métodos: Estudo transversal que comparou a idade da menarca de 750 meninas de escolas particulares com 921 alunas de escolas públicas, com idades entre sete e 18 anos. A menarca foi relatada pelo método *status quo* e a idade da mesma estimada pelo logito. As meninas foram agrupadas pelos pontos de corte do IMC em (magreza + eutrofia) e (sobrepeso + obesidade). Com o intuito de certificar que elas pertenciam a classes diferentes, 328 pais responderam a um questionário para classificar o nível econômico dos alunos.
Resultados: A menarca foi referida por 883 meninas. Embora elas pertençam a classes econômicas distintas ($p < 0,001$), não houve diferença quanto ao diagnóstico nutricional ($p = 0,104$). Também não houve diferença na idade da menarca entre as que estudam em escolas particulares (12,1 anos; IC95%%: 12,0-12,2) e públicas (12,2 anos; IC95%%: 12,1-12,3); $p = 0,383$. Quando avaliadas pelo diagnóstico nutricional só houve diferença na idade da menarca das meninas com e sem excesso de peso de escolas particulares (11,6 e 12,3 anos; $p < 0,001$). As meninas com excesso de peso das escolas particulares também menstruaram mais cedo do que as das escolas públicas (respectivamente, 11,6 e 12,1 anos; $p = 0,016$).
Conclusões: Embora as alunas das escolas particulares ainda pertençam a classes mais altas, atualmente, não existe mais um abismo nutricional e socioeconômico tão grande entre elas quanto a fatores que podem influenciar na idade da menarca.

Introduction

The age at which menarche occurs is of interest, as this event establishes the end of the sexual maturation period in girls, signaling that they are ready to procreate.[1] This implies their introduction into the adult world and, consequently, the onset of sexual activity, exposing them to both the risk of sexually transmitted diseases and pregnancy, whose early occurrence brings a number of difficulties.[2,3]

Several factors have been associated with sexual maturation, which influences age at menarche. According to Tanner, girls of higher social class and those who are better nourished menstruate earlier.[1] Other studies have shown that obesity also anticipates menarche.[4,5]

In recent decades, Brazil and other developing countries have faced problems related to changes in the nutritional profile of their populations.[6–8] If, previously, the high prevalence of malnutrition was of concern, currently the most noteworthy issues are related to overweight and obesity rates.[9] During the first decade of this century, there have also been significant changes in the socioeconomic distribution of Brazilians, reflecting the social mobility that started in the 1970s.[10,11] With the advent of industrialization, the base of the social pyramid slowly began to narrow, but it was not until 2005 that these changes created a new form of socioeconomic distribution of the population. With people migrating from lower to higher levels, the old pyramid-shaped representation of social class distribution has been replaced by the diamond-shaped distribution, in which the majority of the population belongs to an intermediate purchasing power stratum.[10]

Recent changes in the nutritional and socioeconomic profile of the Brazilian population have raised the question about the influence that these factors have had on the age at menarche. Faced with this new reality, this study aimed to evaluate and compare the age at menarche in girls with and without excess weight who attend private and public schools in a city of southeastern Brazil.

Methods

This study described and compared data on 1,671 girls, aged 7-18 years, evaluated in private (in 2010, n = 750) and public (in 2012, n = 921) schools in Campinas, SP, Brazil. The schools were selected by drawing lots among all private and public schools of the municipality, and the girls enrolled in study did so after an informed consent was obtained from the principals and parents/guardians, who agreed with data collection. Of the assessed girls, those who reported pregnancy, non-controlled diseases that could interfere with growth or weight gain, and those who had at the time of study a condition that could interfere with measurements, such as wheelchair use or wearing a plaster splint, were excluded from the study.

The sample size was calculated so that the adolescents would be distributed evenly according to the Tanner maturation stages for breast (B) development, based on Brazilian studies that established the mean age for each stage[12] and the body mass index (BMI) variability for that age.[13] Using the sample size formula for the mean of a quantitative variable (BMI) from a descriptive study, considering the lowest sampling error ($d = 0.7\,kg/m^2$), the highest estimated standard deviation ($SD = 2.9\,kg/m^2$), and a significance level