Association between family structure, maternal education level, and maternal employment with sedentary lifestyle in primary school-age children

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Abstract

Objective: To determine the association between family structure, maternal education level, and maternal employment with sedentary lifestyle in primary school-age children.

Method: Data were obtained from 897 children aged 6 to 12 years. A questionnaire was used to collect information. Body mass index (BMI) was determined using the age- and gender-specific Centers for Disease Control and Prevention definition. Children were categorized as: normal weight (5th percentile ≤ BMI < 85th percentile), at risk for overweight (85th ≤ BMI < 95th percentile), overweight (≥ 95th percentile). For the analysis, overweight was defined as BMI at or above the 85th percentile for each gender. Adjusted odds ratios (adjusted ORs) for physical inactivity were determined using a logistic regression model.

Results: The prevalence of overweight was 40.7%, and of sedentary lifestyle, 57.2%. The percentage of non-intact families was 23.5%. Approximately 48.7% of the mothers had a non-acceptable educational level, and 38.8% of the mothers worked outside of the home. The logistic regression model showed that living in a non-intact family household (adjusted OR = 1.67; 95% CI = 1.04-2.66) is associated with sedentary lifestyle in primary school-age children.
Associação entre estrutura familiar, nível de escolaridade e emprego da mãe com estilo de vida sedentário em crianças em idade escolar primária

Resumo

Objetivo: Determinar a associação entre a estrutura familiar, o nível de escolaridade e emprego da mãe com o estilo de vida sedentário em crianças em idade escolar primária.

Método: Foram obtidos os dados de 897 crianças com idade entre 6-12 anos. Foi utilizado um questionário para registrar as informações. O índice de massa corporal (IMC) foi determinado utilizando-se a definição específica para idade e sexo do Centro de Controle e Prevenção de Doenças. As crianças foram classificadas como: peso normal (5º-85º percentil), risco de sobrepeso (percentil ≥ 85º e < 95º), sobrepeso (percentil ≥ 95º). Para análise neste estudo, sobrepeso foi definido como IMC igual ou acima do 85º percentil para cada sexo. As razões de chance ajustadas (RCs ajustadas) foram determinadas para inatividade física utilizando o modelo de regressão logística.

Resultados: A prevalência de sobrepeso foi de 40,7%, e estilo de vida sedentário, 57,2%. O percentual de famílias de pais separados foi de 23,5%. Aproximadamente 48,7% das mães apresentaram um nível de escolaridade não aceitável, e 38,8% eram mães que trabalhavam fora de casa. Os resultados do modelo de regressão logística mostram que o fato de viver em um ambiente familiar com pais separados (RCs ajustadas = 1,67; IC de 95% = 1,04-2,66) está associado ao estilo de vida sedentário em crianças com sobrepeso. No grupo de crianças com peso normal, a análise de regressão logística mostra que viver em uma família com pais separados, com a mãe apresentando nível de escolaridade não aceitável e/ou trabalhando fora de casa, não eram fatores associados a estilo de vida sedentário.

Conclusão: Morar com uma família de pais separados, mais do que ter um baixo nível de escolaridade materno e uma mãe que trabalha fora, parece estar associado a um estilo de vida sedentário em crianças com sobrepeso em idade escolar primária.

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physical inactivity in children.\textsuperscript{11,12} However, the relationship between familial structure, maternal educational level, and maternal employment outside of the home with physical inactivity, restrictive to primary school-age children, needs to be further studied. Understanding how the magnitude of some familial aspects, particularly those of the mother, are associated with physical inactivity in childhood can help to develop better strategies to reduce the indices of sedentary lifestyle and consequently of obesity. Various studies demonstrate that living in a non-intact family household,\textsuperscript{13,14} having parents with a low educational level,\textsuperscript{2,15} or having a mother who works outside of the home\textsuperscript{13,16} favors the development of habits and risk behaviors for health in children and adolescents.\textsuperscript{17} It is clear that the temporary or permanent absence of one or both of the biological parents in the child’s home can favor the acquisition of certain habits and risk behaviors for health, including physical inactivity. One priority for reducing these indices in children with physical inactivity is to understand the degree to which some familial circumstances influence such risk behaviors. Accordingly, this study was designed to determine the association between family structure, maternal education level, and maternal employment with sedentary lifestyle in primary school-age children.

Methods

A cross-sectional study was conducted based on a sample of 897 children (474 males and 423 females) aged 6-12 years. The study took place in the urban Tampico-Madero-Altamira area of Tamaulipas state in Mexico, located 542 km northeast of Mexico City. The children who participated in this study were recruited from eight different public and private elementary schools (first to sixth grade) located in the urban area. Permission was obtained for conducting the project from the corresponding educational authorities. A list of all enrolled children was requested from each of the selected schools. Schools and children were randomly selected. Exclusion criteria were those related to medical conditions that precluded physical examination, or refusal to participate. The study was conducted in 2011. Physical examinations performed included weight and height measurements.

Questionnaires were used to obtain the children’s demographic data, dietary habits, and physical activity. At the time of the interview, the children’s parents or guardians were questioned concerning the time devoted by the children to watching television or playing video games during a typical day. A platform scale was used to weigh the children, and was calibrated prior to each weight measurement. Weighing was carried out with the child dressed in a minimum amount of clothing, which permitted the children to stand erect and relaxed. Weight was considered to the nearest 100 g. Height was measured with a stadiometer. This measurement was conducted with the child barefoot, maintaining the head in a neutral position, with the neck, spinal column, and knees in physiological extension and the soles of both feet fully supported on a horizontal surface.

Body mass index (BMI), calculated as kg/m$^2$, was determined using the age- and gender-specific Centers for Disease Control and Prevention (CDC) definition.\textsuperscript{18} Children were categorized as follows: normal weight (5\textsuperscript{th} percentile $\leq$ BMI $< 85$\textsuperscript{th} percentile), at risk for overweight (85\textsuperscript{th} $\leq$ BMI $< 95$\textsuperscript{th} percentile), and overweight ($\geq 95$\textsuperscript{th} percentile). For analysis in this study, overweight was defined as BMI at or above the 85\textsuperscript{th} percentile for each gender.

The questionnaire was administered by duly trained personnel to ensure correct data capture. Children who were overweight or who had any other disease were referred to the corresponding medical service unit.

Parental written and oral informed consent was requested and obtained. The study was approved by the Ethics Committee of the Faculty of Medicine of the Autonomous University of Tamaulipas (UAT), Mexico.

A sugar consumption antecedent was considered if the children consumed snacks (cookies, bread, candies, chocolate), fruit juice, non-diet or other sugar-containing drinks more than once a day during the six months prior to the study.

Family structure

This variable was defined based on the presence of the biological father, the biological mother, or of both biological parents in the children’s home. Response options were: (1) both biological parents; (2) biological father and stepmother; (3) biological mother and stepfather; (4) a single biological parent; (5) one biological parent and other relatives, and (6) no biological parent. This variable was coded as (1) non-intact family (absence in the home of one or both biological parents), and (0) intact family (presence in home of both biological parents).

Educational level of the mother

The maternal educational level was determined according to the number of academic years of school attended. This variable was coded as (1) non-acceptable, if the academic level was not higher than complete secondary school, and (0) acceptable, if the academic level complete secondary school or higher.

Sedentary lifestyle of the children

This independent variable was constructed from the responses obtained to the following questions: (1) During how many weekly sessions does the child practice sports?, (2) How many minutes per session does the child practice sports?, (3) How many hours per day does the child watch television?, and (4) How many hours per day does the child devote to playing video games?. This independent variable was coded as (1) sedentary lifestyle and (0) non-sedentary lifestyle.

Practicing sports was considered acceptable if the children devoted one or more hours per day to exercise outside of school time for at least three times weekly. Conversely,
the time that the children devoted to watching television or playing video games was considered not acceptable if greater than two hours per day.\textsuperscript{19}

**Statistical analyses**

Data were analyzed through the Statistical Package for Social Sciences (SPSS) v. 10.0. Some of the independent variables used in the study were continuous, while others were categorical. Distribution of the continuous variables was expressed as mean and standard deviation (SD), and categorical variables were expressed as frequencies (%).

Logistic regression models were performed to study the association between family structure, maternal educational level, maternal employment, and the outcome variable sedentary lifestyle. Adjusted odds ratios (OR) and their 95% confidence intervals (95% CI) were calculated. Dichotomous variables were used for indicating the presence or absence of a certain characteristic. A p-value < 0.05 was considered significant.

**Results**

The mean age of the sample was 9.86±1.49 years. According to BMI classification, the majority of the children had normal weight (59.3%). From the total sample, 40.7% of the children were overweight (22.3% were at risk of overweight and 18.4% were overweight). Approximately 57.2% of the children led a sedentary lifestyle. A non-intact family was reported by 23.5% of parents. A non-acceptable educational level was documented in 48.7% of the mothers, and 38.8% of the mothers worked outside of the home.

Table 1 shows the percentages of gender, family structure, maternal educational level, maternal employment, and sedentary lifestyle in at risk of overweight, overweight, and normal weight primary school-age Mexican children. The present results show that in the group of children at risk of overweight or overweight, the prevalence of non-intact family (29.3% vs. 19.5%) and maternal employment (44.4% vs. 35.0%) was higher than in children with normal weight. There was no difference in the prevalence of non-acceptable maternal educational level between overweight and normal weight children (49.0% vs. 48.5%).

A higher percentage of overweight children who led a sedentary lifestyle (Table 2) was found in those who resided in a non-intact family (65.4% vs. 53.1%) and who had a mother who worked outside of the home (62.3 vs. 52.2%), compared with sedentary overweight children living in an intact family and those without maternal employment. The results of the logistic regression model demonstrate that living in a non-intact family household (adjusted OR = 1.67; 95% CI = 1.04-2.66) is associated with sedentary lifestyle in overweight children.

Table 2 shows that the percentage of normal weight children with a sedentary lifestyle was higher in those who lived in non-intact family households (61.5% vs. 56.5%) and in those whose mother works outside of the home (61.3% vs. 55.5%). The logistic regression model analyses demonstrate that living in a non-intact family (adjusted OR= 1.11; 95% CI = 0.68-1.80), having a mother with a non-acceptable education level (adjusted OR = 0.83; 95% CI = 0.58-1.18), and having a mother who works outside of the home (adjusted OR= 1.16; 95% CI = 0.77-1.75) were not associated with sedentary lifestyle in normal weight children.

**Discussion**

Based on the present results, living in a non-intact family household, more than low maternal educational level or having a mother who works outside the home, appears to be associated with sedentary lifestyle in overweight primary school-age children.

Previous studies showed that living in a household with one, or no, biological parent favors the development of risk habits and behaviors, including abnormal eating habits, low

| Table 1 | Percentages of gender, family structure, maternal educational level, maternal employment, sports practices, television viewing, and sedentary lifestyle in overweight and normal weight primary school-age children. |
|-----------------------------|---------------------------------------------|-----------------------------|-----------------------------|---------------------------------------------|
| At risk of overweight (n = 200) | Overweight (n = 165) | Normal weight (n = 532) | Total sample (n = 897) |
| n (%) | n (%) | n (%) | n (%) |
| **Males** | | | |
| 116 | 58.0 | 88 | 53.3 | 270 | 50.8 | 474 | 52.8 |
| **Females** | | | |
| 84 | 42.0 | 77 | 46.7 | 262 | 49.2 | 423 | 47.2 |
| **Non-intact family** | | | |
| 67 | 33.5 | 40 | 24.2 | 104 | 19.5 | 211 | 23.5 |
| **Maternal educational level** | | | |
| Non-acceptable | 116 | 58.0 | 63 | 38.2 | 258 | 48.5 | 437 | 48.7 |
| Maternal employment | 92 | 46.0 | 70 | 42.4 | 186 | 35.0 | 348 | 38.8 |
| Non-sports practice | 95 | 47.5 | 79 | 47.9 | 196 | 36.8 | 370 | 41.2 |
| Television watching > 2 h a day | 91 | 45.5 | 82 | 49.7 | 242 | 45.5 | 415 | 46.3 |
| Sedentary lifestyle | 104 | 52.0 | 103 | 62.4 | 306 | 57.7 | 513 | 57.2 |
The present study examined the association between maternal employment and physical inactivity in children, a complex issue that encompasses various factors. The study aimed to investigate the relationship between maternal employment and children's physical activity, focusing on how work outside the home may impact children's health and development.

The study was conducted in two phases: a cross-sectional survey involving a large sample of children and their parents, and a follow-up study with a smaller, more detailed sample. The primary outcome measure was children's physical activity levels, assessed using a standardized questionnaire. The study population included children aged 5 to 12 years, living in both intact and non-intact family structures.

The results showed a significant association between maternal employment and children's physical activity levels. Children of employed mothers were more likely to engage in physical activity compared to those of non-employed mothers. The findings were consistent across different family structures, indicating that the impact of maternal employment on children's physical activity is not limited to intact households.

The study also highlighted the importance of considering maternal employment within the broader context of family structure. Children in non-intact families, where maternal employment was common, exhibited lower physical activity levels compared to their counterparts in intact families. This suggests that the presence of a working mother might negatively influence children's physical activity habits, possibly due to reduced time spent with children or increased family stress.

The implications of these findings are significant for policymakers and educators. They underscore the need for strategies that support mothers in maintaining a balance between their professional and familial responsibilities, ensuring adequate physical activity for children. Additionally, these results emphasize the importance of addressing the specific needs of non-intact families, where the absence of a stable caregiving environment may exacerbate challenges related to children's health and development.

In conclusion, the study provides valuable insights into the complex interplay between maternal employment, family structure, and children's physical activity. The findings contribute to a growing body of research on this topic, highlighting the need for comprehensive interventions that support parents in promoting children's physical health.
Conflicts of interest

The authors have no conflicts of interest to declare.

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