Preventive Medicine 61 (2014) 48–53

Contents lists available at ScienceDirect

Preventive Medicine

journal homepage: www.elsevier.com/locate/ypmed

Influence of family structure on obesogenic behaviors and placement of bedroom TVs of American children: National Survey of Children's Health 2007

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ARTICLE INFO

Available online 15 January 2014

Keywords:
Siblings
Blended family
Television viewing
Exercise
Family meals

ABSTRACT

Objective. To explore the relation between family structure and obesogenic attributes.

Methods. Publicly available data from the 2007 National Survey of Children's Health (n = 55,094; 11.6 ± 0.04 years; 51.2% male) was analyzed in fall 2012. Predictor variables included marital status (two-parent biological [referent], two-parent blended, single-mother, and other) and number of children. Outcome variables included the presence of a bedroom television (BTV), elevated television (TV) viewing time, insufficient physical activity, and infrequent family meals.

Results. Analysis of family structure revealed 63% biological, 11% blended, and 20% single-mother families. Twenty-three percent of children did not have siblings. When family structure variables were considered independently, children in blended (odds ratio (OR): 1.75; 95% confidence interval (CI) 1.45, 2.10) and single-mother homes (1.49; 1.28, 1.74) had higher odds of BTV. Children in blended families had higher odds of elevated TV viewing time (1.28; 1.08, 1.51). Single-mother homes had higher odds of infrequent family meals (1.28; 1.07, 1.52). Families with ≥2 children were less likely to have BTV (0.60; 0.54, 0.66) or elevated TV viewing time (0.74; 0.67, 0.82), and to irregularly dine together (0.89; 0.80, 0.99).

Conclusion. Diverse family structure was associated with more obesogenic behaviors and environments. The presence of siblings diminished, but did not eliminate, the risk.

Introduction

In the U.S., nearly 32% of children are overweight or obese (Ogden et al., 2012). Decreasing the prevalence of overweight children is a national priority which is addressed in several federal campaigns (Let's Move!, 2010; National Heart Lung and Blood Institute [NHLBI], 2013; United States Department of Health and Human Services [USDHHS], 2010). Despite this, few studies have examined the relation between family structure, obesogenic behaviors, and environmental characteristics. The studies available suggest that children of divorced parents are more likely to be overweight (Schmeer, 2012; Tremblay and Willms, 2003) as are children living with grandparents (Formisano et al., 2013). Children with more siblings have lower levels of adiposity (Formisano et al., 2013).

With the increase in obesity prevalence in the U.S., several simultaneous changes in family structure have occurred. Marriage rates have decreased while divorce rates have increased (United States Census Bureau [USCB], 2011). More mothers are unmarried, as evidenced by an increase from 26.6% to 39.7% of births (USCB, 2011). Children living with single mothers and in two-parent blended families are more likely to report ≥2 h of daily TV viewing time (TV time) (Sisson et al., 2011a) and having a TV in their bedroom (BTV) (Sisson et al., 2011b). Since over 12 million children live in blended families (USCB, 2008), the relations between family structure, obesogenic behaviors, and environmental characteristics warrant greater attention.

Outside the U.S., children living with two parents report more physical activity (Hesketh et al., 2006; McVeigh et al., 2004; Theodorakis et al., 2004), and sports participation (Tremblay and Willms, 2003), and less TV time (Bagley et al., 2006; Tremblay and Willms, 2003) and sedentary behavior (Gorely et al., 2009) than those in single-parent homes. Further, single-parent status was noted as a frequent correlate of excessive TV time in children and adolescents (Gorely et al., 2004). No distinction was made between biological and blended parents in most of these studies. Moreover, no studies have examined family structure and the frequency of family meals, despite evidence supporting the healthful benefit of family meals (Hammons and Fiese, 2011; Neumark-Sztainer et al., 2003; Sisson et al., 2011a).

When the presence and number of siblings are examined, findings increase in complexity. Female only children in single-parent homes

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0091-7435/$ – see front matter © 2014 Published by Elsevier Inc.
http://dx.doi.org/10.1016/j.ypmed.2014.01.010

had higher physical activity and less TV time than girls in two-parent homes (Bagley et al., 2006). In single-parent families, girls with siblings reported more TV time (Bagley et al., 2006). The opposite was true for boys (Bagley et al., 2006). Regardless of family structure, having siblings was associated with higher physical activity in both genders (Bagley et al., 2006; Hesketh et al., 2006).

Understanding the role of family structure is important to determine its contribution to health behaviors, environment, and outcomes. Family structure could be a moderating factor (not changeable by intervention) which may introduce mediating variables like conflict, stress, instability, and chaos, which have known associations with obesogenic behaviors (Amato, 2005; Brown, 2010). Given the limited, conflicting literature and the dearth of studies using nationally-representative samples of children, the purpose of this study was to explore the relation between family structure (marital status and number of siblings) and obesogenic behaviors and environments, including elevated TV time, insufficient physical activity, infrequent family meals, and BTV. We selected these variables based on their association with obesity and emphasis in national recommendations (Barnes and Task Force on Childhood Obesity [TFCO], 2011; American Academy of Pediatrics [AAP], 2001; USDHHS, 2008). Examining this group of behaviors is prudent as obesity-related behavioral risk factors have a tendency to cluster (Barr-Anderson et al., 2008; Brown et al., 2010; Lipsky and Iannotti, 2012; Sisson et al., 2011a; Sisson et al., 2011b; Sisson et al., 2012). We hypothesized that children living in diverse family structures would engage in more obesogenic behaviors, while children living in families with more than one child would engage in fewer obesogenic behaviors.

Methods

Data

Between April 2007 and July 2008, the National Survey of Children's Health was administered to households with children ages zero through 17 years via computer-assisted telephone interview (Child and Adolescent Health Measurement Initiative [CAHMI], Blumberg et al., 2009). We performed secondary analysis on this data in fall 2012.

Sample

The identified questions of interest were asked of parents of children ages six years and older. Overweight status was available for children ≥10 years of age ([CAHMI], 2007; Blumberg et al., 2009). The analytical sample size was 55,094 children (28,637 boys; 26,457 girls). The sample size for analyses including overweight status was 38,376 children (19,995 boys; 18,381 girls).

Independent variables

The National Survey of Children's Health classifies marital status into one of four categories: two-parent biological/adoptive, two-parent blended family, single-mother with no father, and other. To maintain consistency with previous research (Bagley et al., 2006; Hesketh et al., 2006) and to aid in interpretation, in our analyses the number of children in the household was collapsed to "only child" and "≥2".

Main outcomes

BTV was assessed by a yes/no question, "Is there a television in [child's] bedroom?" TV time was assessed using the response to the question, "On an average weekday, about how much time does [child] usually watch TV, watch videos, or play video games?" The National Survey of Children's Health classified responses as: "does not watch TV", "watches 1 hour or less per day", "watches more than one hour but less than four hours per day", or "watched four hours or more per day." Elevated TV time was defined as watching >1 h/day. While ≥2 h/day aligns with most literature and recommendations (2001), the survey categories preclude that classification. Weekly physical activity was determined by answers to the following: "During the past week, on how many days did [child] exercise, play a sport, or participate in physical activity for at least 20 minutes that made [child] sweat and breathe hard?" Respondents could reply with any number of days, "do not know", or "refused". Insufficient physical activity was classified as <6 days/week (National Association of Sport and Physical Education, 2010). Frequency of family meals was determined by asking "During the past week, on how many days did all the family members who live in the household eat a meal together?" Respondents could answer with any number of days, "do not know", or "refused". As no standardized definition exists and a critical number of meals/week has not been established (Fiese and Schwartz, 2008), irregular family meals were classified as dining as a family <4 days/week.

Socio-demographic variables and covariates

Child-level covariates in both series of models included age, sex, race/ethnicity, and poverty. All covariates were included in each analysis regardless of significance in a specific model.

Analytical methods

Weighted descriptive characteristics were calculated (means ± SE or frequencies). Survey procedures, weight, and strata were used to account for the complex sampling and to ensure nationally representative findings. To examine the relation between both of the family structure variables and each of the obesogenic-related outcomes, logistic regression models were calculated, adjusting for age, sex, race/ethnicity, and poverty level. A second logistic regression analysis that included overweight status in addition to all dependent variables, independent variables, and covariates was calculated (Table 2). We created a combined marital status and household children variable and examined it in relation to the obesogenic-related outcomes. This logistic regression was adjusted for covariates noted above (Table 3). SAS 9.2 (Cary, NC) software was used for all analyses.

Results

Descriptive and behavioral characteristics are depicted in Table 1. Given little difference in odds ratios with the inclusion of overweight status, and that sample size was restricted to children ≥10 years of age, results are presented for the full sample only (Table 2, Model 1). Analyses with overweight status are included for reference in Table 2. In the independent analyses, children in two-parent blended families were 75% more likely to have BTV compared to children in two-parent biological/adopted structures (Table 2). Children in single-mother homes were 49% more likely to have BTV. Children from two-parent blended families were 28% more likely to have elevated TV time. No marital statuses were associated with insufficient physical activity. Single-mother homes were 28% more likely to infrequently dine as a family. Families with ≥2 children were 40% less likely to have BTV, 26% less likely to have elevated TV time, and 11% less likely to irregularly dine together. No relation was observed between sibling status and insufficient physical activity.

In the combined family structure analyses, children in two-parent biological families with ≥2 children were 47% less likely to have BTV, while only children in two-parent blended families were 60% more likely to have BTV, compared to two-parent biological, only child homes (Table 3). Two-parent biological and single-mother homes with ≥2 children were less likely to engage in elevated TV time. No combined relations were present regarding insufficient physical activity. Only the two-parent biological families with ≥2 children were associated with fewer infrequent family meals (i.e., more family meals).

Discussion

This study provides a distinct contribution to the literature by including blended families, examining marital and child status, and utilizing a nationally representative sample of children. The primary finding was that family structure does significantly impact some TV time, infrequent family dinners, and the presence of BTV. Marital status was associated with more obesogenic behaviors and environments, including more BTV (for both blended and single-mother households), elevated TV time (blended households), and infrequent family meals (single-mother households). Having more than one child in the home was