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Youth and Caregiver Physical Activity and Sedentary Time: HCHS/SOL Youth

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Human Subjects Statement
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Abstract

Objectives—We examined associations between youth and caregiver moderate/vigorous physical activity (MVPA) and sedentary (SED) time, using accelerometery, in the Hispanic Community Health Study/Study of Latino Youth (HCHS/SOL) Youth.

Methods—Participants were 623 caregivers and 877 youth 8–16 years old, enrolled in 2012–2014. Associations of youth and caregiver MVPA time, SED time, and meeting MVPA recommendations (> 150 min/week, adults; > 420 min/week, youth) were examined in regression models that controlled for sample weights, design effects, and demographic and health covariates.

Results—Youth whose caregivers met MVPA recommendations were nearly twice as likely to meet these recommendations themselves when compared to youth whose caregivers did not meet MVPA recommendations (OR = 1.9, 95% CI 1.1, 3.3). Youth and caregiver SED time also were significantly related ($p < .05$). A similar pattern of findings was observed in analyses limited to relationships in which the caregiver was a biological parent of the youth (N = 485 caregivers; N = 795 youth).

Conclusions—MVPA and SED are correlated within Latino families as observed by statistically significant relationships of youth and caregiver activity. Additional research is needed to understand underlying genetic and environmental factors that explain these findings.

Keywords

Hispanic; physical activity; sedentary time; youth

Overweight and obesity disproportionately affect ethnic/racial minority youth in the United States (US).[1] According to the 2013–2014 National Health and Nutrition Examination Survey (NHANES), obesity prevalence was 15.6%, 25%, and 22.8% among Hispanic/Latino (hereafter Latino) youth ages 2–5 years, 6–11 years, and 12–19 years, respectively, compared with 5.2%, 13.6%, and 19.6 among non-Latino white youth of the same age groups.[1] In the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Youth (ie, "SOL Youth"),[2,3] 26.5% and 19.9% of youth aged 8 to 16 were obese and overweight, respectively.[4] Whereas increasing physical activity and limiting sedentary time may prevent obesity and future health problems,[5–7] few children and adolescents meet 2008 US Department of Health and Human Services recommendations for activity levels of at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily[8] or screen time limits of no more than 2 hours daily.[9]

For example, in the 2009–2010 National Health and Nutrition Examination Survey (NHANES), less than 40% of children aged 6–11 years met both physical activity and screen-time recommendations according to parental proxy report.[10] Relative to non-Latino white youth, Latino children were more likely to meet screen time limits (61.7% of Latinos vs 55.4% of non-Latino Whites) but less likely to obtain sufficient MVPA (65.7% of Latinos vs 73.4% of non-Latino Whites).[10] Importantly, adherence to these health recommendations seems to decline markedly in adolescence. The 2012 NHANES Youth and Fitness Survey found that only about one-fourth of children 12–15 years old self-reported engaging in at least 60 minutes of MVPA each day[11] (ethnic/racial differences not reported), and only 27.0% reported 2 hours or less of screen time daily (26.7% versus 29.4% in Latino and non-Latino white adolescents, respectively).[12] Additional information is needed regarding the modifiable factors that shape sedentary and physical activity behaviors in youth, especially in Latinos who are vulnerable to obesity and related health problems.

The socio-ecological model posits that physical activity and sedentary behaviors are a function of multiple influences at the individual, interpersonal, social, built environment, and policy levels.[13,14] In youth, the family is an important social context that shapes activity behaviors, and is influenced by higher order levels of the socio-ecological model. Similarly, the familial aggregation model suggests that health behaviors and risk factors cluster in family members due to shared genetic, social, and environmental influences.[15,16] For example, parents may provide direct support to their children in being physically active by registering them for sports or engaging in activities with them, and indirect support through encouragement and positive reinforcement. Behavioral modeling may be another social influence that fosters activity in youth of active caregivers.[17] Within the socio-ecological framework, families share proximal environmental contexts (eg, access to home exercise equipment) and higher level built (eg, neighborhood parks and sidewalks), social (community crime), and policy level factors (eg, urban planning; transport systems) that can promote common activity behaviors.[18]

As a result of shared genetic and environmental influences, youth and their parents/caregivers would be expected to exhibit correlated patterns of physical activity and sedentary behavior. However, a series of qualitative and quantitative reviews highlights mixed evidence for associations of parent/caregiver and youth activity levels. For example, one review and meta-analysis identified a small but significant positive effect size,[19] 3 reviews suggested no significant association,[14,20,21] and 8 concluded that findings of the reviewed studies were too inconsistent to permit definitive conclusions.[17,22–28] The direction and strength of effects of associations between parent and youth activity have varied in these studies by factors including youth age, sex, and method of physical activity measurement. A 2015 systematic review and meta-analysis sought to address limitations in prior reviews and provide a more conclusive picture of the literature.[29] This meta-analysis reported evidence of a small but significant overall association (r = .16, 95% CI .09, .24) between parent and youth physical activity, and identified substantial heterogeneity across the 36 included effect sizes that could not be explained systematically by various moderators (ie, child age, sex, geographical location, measurement).

An important limitation of the existing literature is that most prior studies have relied on self- or proxy-reported activity that correlates poorly with objective assessments (eg, by accelerometer) and is subject to recall biases.[30,31] In the 2015 systematic review discussed above, only 11 out of 36 effect sizes examined were based on objective assessments.[29] Furthermore, despite research showing that time spent being sedentary (SED) is predictive of obesity and other health outcomes in youth beyond the effects of physical activity,[7] research on the determinants of SED in youth, including parental/caregiver behavior, remains limited.[32,33] Studies examining associations of youth and parent/caregiver MVPA among Latinos also are scarce. One study of self-reported activity levels in Mexican-American and non-Latino white parents and their 5th and 6th grade children found moderate associations in activity behaviors, with stronger relationships in families of Mexican descent than in non-Latino white families.[34] A second, more recent study identified a large association between minutes of MVPA assessed objectively in 80 3–5 year-old Latino children and their mothers.[35] Thus, the limited existing research suggests significant patterning of MVPA within Latino families, but additional investigation is needed to examine a range of child ages and backgrounds using objective assessment.

To address these gaps in the literature, the current study examined associations of Latino youth and parent/caregiver physical activity and sedentary time, as measured by accelerometery, in the SOL Youth cohort. Following the tenets of the familial aggregation model and socio-ecological framework, we hypothesized that caregiver and youth MVPA and SED time and likelihood of meeting MVPA recommendations would be significantly and positively associated.

METHODS

Study Population and Design

The HCHS/SOL is a population-based observational cohort study of chronic disease prevalence, incidence, and risk factors in 16,415 adults, 18–74 years old at baseline, who self-identified as Hispanic/Latino and of Central American, Cuban, Dominican, Mexican, Puerto Rican, South American, or other or more than one Hispanic/Latino heritage. HCHS/SOL participants were recruited using a 2-stage probability sampling approach in 2008–2011 from Chicago, IL, Miami, FL, Bronx, NY, and San Diego, CA. Details regarding the population and sampling approach[36] and methods of the HCHS/SOL[37] have been reported elsewhere. As described in prior publications,[2,3] SOL Youth is a cross-sectional cohort study of youth ages 8 to 16 years, living with a HCHS/SOL participant, and free from known serious health issues. Although all SOL-Youth participants were residing with a HCHS/SOL participant, the parent/caregiver (hereafter, caregiver) enrolled in the SOL-Youth ancillary study was not required to be the HCHS/SOL participant, nor be a biological relative, and all eligible youth in a family were invited. The study sought equal proportions of male and female youth.

Of 1777 eligible youth identified through screening, 1466 (82%) participated with their caregivers (N = 1020) between 2012 and 2014. Nearly all caregivers (96.4%) were HCHS/SOL participants and 80% were female. The current sample included 877 youth and 623 caregivers who were adherent to accelerometery measurements (defined below). Group comparisons for youth and caregiver demographics, youth body mass index (BMI), and depression symptoms showed no significant differences between non-adherent youth and caregivers versus those in the current study (data not shown).

Measures

Physical activity and sedentary time—As reported previously,[38] HCHS/SOL participants (here, SOL Youth caregivers) wore an Actical accelerometer (version B-1, model 198-0200-03) positioned above the iliac crest, with removal for swimming, showering, and sleeping, for one week. The Actical captured 1-minute epochs.[39] SOL Youth followed the same protocol, but epoch length was set to 15 seconds to capture more intermittent activity patterns.[39] Consistent with other HCHS/SOL reports[40] adherence was defined in adults as accelerometer wear time ≥10 hours/day for ≥3 days and ≤23 hours daily on average. In youth, adherence was defined as wear time ≥8 hours/day for ≥3 days. Accelerometer data from midnight to 5am were excluded for maximum wear time of 19 hours. Non-wear time was identified according to Choi et al.[41] Activity thresholds in adults were: light, 100–1534 counts/minute; moderate, 1535–3961 counts/minute; and vigorous, ≥3962 counts/minute.[42] For youth, thresholds were: light, 18–440 counts/15-second; moderate, 441–872 counts/15-second; and vigorous, ≥873 counts/15-second.[43] In both adults and youth, minutes/day of MPVA were summed and averaged across adherent days, and multiplied by 7 to represent minutes per week. According to current national activity recommendations for optimal health,[8] caregivers were categorized according to whether or not they received ≥150 minutes/week MVPA, and youth ≥ 420 minutes/week MVPA (ie, at least 60 minutes daily). Sedentary time (SED) was classified as <100 counts/minute for adults[44] and <18 counts/15-seconds for youth. Average SED minutes/day across adherent days were analyzed.

Covariates—Demographic factors and health history were assessed by self-report in participants' preferred language. Using standardized protocols, weight was measured for both youth and caregivers on a digital scale (Tanita Body Composition Analyzer, TBF 300, Japan) to the nearest 0.1 kg and height to the nearest cm using a wall-mounted stadiometer (SECA 222, Germany). BMI was calculated, and in youth was represented as age- and sex-standardized BMI percentile. The Child Depression Inventory[45] and Center for Epidemiologic Studies Depression Scale-10[46] assessed depression symptoms in youth and caregivers, respectively. Youth asthma (by caregiver report), and caregiver health comorbidities (composite variable reflecting diabetes, cardiovascular disease, obstructive lung disease, cancer[47]) also were assessed.

Statistical Analysis

All analyses accounted for design effects and sample weights. Descriptive statistics were calculated in IBM SPSS Statistics 20.0 (IBM, Inc., Armonk, NY) using complex survey procedures. The maximum likelihood robust (MLR) estimation procedure in MPlus[48] was used to estimate all remaining models. MLR is a full-information maximum likelihood (FIML) approach in which model parameters and standard errors are estimated using both complete and partial cases. MLR produces unbiased estimates under various missing data conditions.[49]

Linear regression models were used to examine associations between youth (outcome) and caregiver (exposure) minutes/day MVPA and SED, and logistic regression was used to examine youth meeting ≥ 60 minutes MVPA daily (outcome). In addition to examining bivariate associations (Model 1), we conducted analyses controlling for sociodemographic and health variables that have been related to activity levels in prior research, or were important design features of the current study, to determine the associations of youth and caregiver MVPA and SED after accounting for these potential confounds. Specifically, these multivariable models adjusted for youth age, sex, Latino background, and nativity, caregiver age, sex, and nativity, family socioeconomic status (household income; caregiver education), study site (location), and number of enrolled children in the family (Model 2); and physical and mental health variables that could influence activity levels (youth and caregiver BMI and depression, youth asthma, and caregiver health comorbidities; Model 3). In linear models, MVPA and SED time were modeled in 10-minute increments to facilitate interpretation of results. Because wear time was strongly associated with SED ($r_{youth} = .77$, $r_{caregiver} = .84$), initial analyses regressed SED on wear time and residuals were modeled.

As some prior research suggests that predictors of youth physical activity may vary by youth sex and age,[24,26] we examined effect modification of youth and caregiver SED and MVPA associations by these demographic factors. After testing main effects in the models described above, interaction terms (eg, youth sex by caregiver MVPA; youth age by caregiver SED) were created and entered as additional predictors in the regression models. In addition, given that concordance of health behaviors is posited to reflect both genetic and environmental influences,[15,16] associations could be stronger in biologically related pairs. Thus, we conducted sensitivity analyses that repeated the models above, restricting the sample to caregivers who were biological mothers or fathers of youth participants (N = 485 caregivers; N = 795 youth).

RESULTS

Sample Characteristics

Descriptive statistics are presented in Tables 1 (youth) and 2 (caregivers). Among sample youth, 59.6% were 8–12 years old, 51.0% female, 77.0% US-born, and 81.0% preferred English. Youth were in the 72.6th percentile (SD = 28.6) on average for BMI, displayed 34.6 minutes/day (SD = 21.1) MVPA, 604.2 minutes/day (SD = 114.8) SED, and 10.4% met activity recommendations. Nearly all youth self-identified as Hispanic/Latino, with about half reporting Mexican heritage. Among caregivers, 54.8% were 18–45 years, 86.5% female, 87.6% non-US- born, and 82.8% preferred Spanish. Average caregiver BMI was 30.4 (SD = 6.5), MVPA was 20.8 minutes/day (SD = 20.2), SED was 714.0 minutes/day (SD = 170.9), and 37.6% met MVPA recommendations.

Associations between Youth and Caregiver MVPA and SED

As Table 3 shows, caregiver MVPA was significantly and positively associated with youth MVPA time in the bivariate model (B = 1.2, p = .016; 95% CI: 0.2, 2.2) but not in adjusted models. Caregiver SED was associated with youth SED in all models (B = 0.9, p = .001; 95% CI: 0.3, 1.4; Model 3). As Table 4 shows, caregivers meeting MVPA recommendations related to youth meeting recommended MVPA recommendations (OR = 1.9; p = .035; 95% CI: 1.1, 3.3; Model 3).

When analyses were restricted to biological parents and youth, results were similar to those in the full sample. Caregiver SED related to youth SED (Table 3; B = 0.9, p = .001; 95% CI: 0.3, 1.4; final model) and caregivers meeting MVPA recommendations were more likely to have youth meeting MVPA recommendations (Table 4; OR = 2.1, p = .019; 95% CI: 1.1, 3.8; final model). Models testing effect modification by youth age and sex revealed no significant interaction effects (R^2 change all < .005, all p > .05; data not shown).

DISCUSSION

The current study showed that after controlling for multiple demographic and health factors, Latino youth whose caregivers engaged in at least 150 minutes of MVPA weekly were almost twice as likely to obtain at least 60 minutes of MVPA daily. Furthermore, youth whose caregivers spent more time sedentary also displayed greater sedentary time. Tests of effect modification showed that associations were consistent across youth age and sex groups, and sensitivity analyses revealed similar associations in biological pairs as in all participants. Prior research has shown inconsistent evidence for aggregation of MVPA within families; however, most studies have relied on self- or parental reports of activity and few have examined Latino families.

Few youth met daily MVPA recommendations in the current study and youth were sedentary for more than 10 hours/day on average. These trends highlight an important area for intervention, given substantial evidence that MVPA protects youth from obesity and future health problems.[5] Evidence for the role of SED time in obesity and cardiometabolic health indicators in youth has been less consistent, and varies by type of sedentary behavior, youth age, and other factors.[50,51] However, one review of systematic reviews concerning sedentary behavior and health in youth found strong evidence of a relationship between television and screen time with obesity, and moderate evidence for associations with blood pressure and total cholesterol, independent of physical activity.[7] In addition, intervention studies have shown that reducing SED leads to a significant decrease in BMI among youth.[6,52–54] Thus, interventions targeting SED may complement youth obesity intervention and physical activity promotion efforts and could reduce cardiometabolic risk later in life.

According to the socio-ecological model[14] and the familial aggregation model,[16] family members would be expected to show shared patterns of activity and inactivity due to common genetic and environmental influences. Modifiable social and environmental factors are important influences and potential targets for both individual and family level interventions. Increasing activity among caregivers may convey positive norms and support and reinforce youth physical activity.[17] Research concerning the specific pathways through which behaviors are transmitted from caregivers to youth (or vice versa) was outside the scope of the current study but is an important direction for future research to guide interventions.

As described above, few prior studies have addressed associations of physical activity behaviors within Latino families and some research suggests that correlates of youth physical activity vary by race/ethnicity.[55] Our study and the only 2 prior studies that (to our knowledge) have examined associations between Latino parent/caregiver and youth physical activity levels identified moderate to strong associations.[34,35] From a sociocultural perspective, behavioral aggregation could be stronger within Latino families due to traditionally higher family cohesion and valuation,[56] which might lead families to share activities and support mutual interests. Strong family ties could be a resource for interventions addressing obesity-related behaviors in Latino youth and physical activity and sedentary interventions including parents/caregivers may be particularly effective.[57]

Several limitations should be considered in interpreting the current findings. Foremost among these, the cross-sectional design prohibits conclusions regarding temporal relationships and causality. In addition, methods for measuring and scoring SED time are still under consideration[58] and national guidelines for SED time are not available. National MVPA recommendations for optimal health[8] were based on research using self-report and may not translate to objective approaches. We did not examine the behavioral contexts and environments in which youth and caregivers were active or sedentary, or study the impact of levels of the socio-ecological model beyond the family, which could help guide intervention approaches. Features of the neighborhood and school environment, peer influences, and broader policies are other important factors beyond the family context. The gap in time between the caregiver and youth activity assessments, and possible differences due to season, days, or other factors may have attenuated true associations. Finally, results may not generalize to other age groups or segments of US youth (eg, other ethnic groups), or the Latino youth population (eg, those from rural areas).

In conclusion, our study provides evidence that MVPA and SED time aggregate within Latino families as observed by associations of youth and caregiver behavior. These findings can help inform future research that seeks to develop effective behavioral interventions to stem the high rates of obesity in Latino youth.

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Table 1

Demographic and Health Characteristics for SOL Youth (N = 877)

Characteristic	N[a]	Sample Percent (%)	Weighted Percent (%)[f]
Sex			
Female	447	51.0	50.7
Male	430	49.0	49.3
Age, years			
8–12	523	59.6	56.3
13–16	354	40.4	43.7
Hispanic/Latino (self-identified)			
Yes	24	2.7	2.0
No	829	94.5	98.0
Hispanic/Latino background			
Central American	60	7.2	5.4
Cuban	67	8.1	5.9
Dominican	99	11.9	12.7
Mexican	409	49.3	55.1
Puerto Rican	71	8.6	9.7
South American	37	4.5	3.9
More than one/Other	86	10.4	11.3
Nativity			
Not born in US mainland/territory	261	23.0	13.2
Born in US mainland/territory	609	77.0	86.8
Language of interview			
Spanish	166	19.0	18.4
English	709	81.0	81.6
Asthma diagnosis[b]			10.7
Yes	87	10.0	10.7
No	785	90.0	89.3
Met recommendations for MVPA[c]			
Yes	91	10.4	10.9
No	756	89.6	89.1
	N	**Unweighted M (SD)**	**Weighted M (SE)**[f]
Standardized BMI percentile (kg/m^2)[d]	877	72.6 (28.6)	73.3 (1.3)
MVPA (minutes/day)	877	34.6 (21.1)	35.01 (21.9)
SED (minutes/day)	877	604.2 (114.9)	610.9 (113.1)
Depression symptoms (CDI scores)	877	2.3 (2.6)	1.7 (2.6)
Accelerometer wear time (hours/day)[e]	877	13.7 (2.0)	13.8 (2.0)

Note.

CDI = Child Depression Inventory; BMI = Body Mass Index; MVPA = Average Minutes/Day of Moderate and Vigorous Physical Activity; SED = Average Minutes of Sedentary Time per day.

[a] = Total sample sizes vary slightly across variables due to missing data;

[b] = By caregiver report;

[c] = Defined as 60 or more minutes per day of MVPA (ie, ≥420 minutes per week) based on average across adherent days;

[d] = Age and sex-standardized BMI percentile;

[e] = Average daily accelerometer wear time (hours) among adherent days, ranging from 8 to 19 hours;

[f] = Weighted data use sampling weights from SOL Youth to account for differential selection probabilities and non-response.

Table 2

Demographic and Health Characteristics for SOL Youth Parents/Caregivers (N = 623)

Characteristic	N[a]	Sample Percent (%)	Weighted Percent (%)[f]
Sex			
Female	537	86.5	88.8
Male	84	13.5	11.2
Age, years			
18–45	341	54.8	67.1
45+	281	45.2	32.9
Hispanic/Latino background			
Central American	55	8.8	7.0
Cuban	57	9.1	6.9
Dominican	82	13.2	15.6
Mexican	305	49.0	50.5
Puerto Rican	64	10.3	11.9
South American	50	8.0	6.6
More than one/Other	10	1.6	1.6
Site			
Bronx, NY	175	28.1	37.9
Chicago, IL	164	26.3	17.4
Miami, FL	114	18.3	13.8
San Diego, CA	170	27.3	31.0
Household yearly income			
< $30K	313	60.7	57.8
> $30K	203	39.3	42.2
Educational Attainment[b]			
< HS diploma or GED	227	36.6	37.3
HS diploma or GED	166	26.7	27.2
> HS diploma or GED	228	36.7	35.5
Nativity			
Not born in the US mainland/territory	545	87.6	85.4
Born in US mainland/territory	77	12.4	14.6
Language of interview			
Spanish	515	82.8	81.4
English	107	17.2	18.6
Met recommendations for MVPA[c]			
Yes	234	37.6	41.9
No	389	62.4	58.1
	N	**Unweighted M (SD)**	**Weighted M (SE)[f]**
BMI (kg/m^2)	623	30.4 (6.5)	30.4 (0.4)

Characteristic	N[a]	Sample Percent (%)	Weighted Percent (%)[f]
MVPA (minutes/day)	623	20.8 (20.2)	23.2 (22.9)
SED (minutes/day)[d]	623	714.0 (170.9)	717.3 (171.1)
Comorbidities index[e]	623	0.5 (0.8)	0.4 (0.7)
Depression symptoms (CESD-10 scores)	615	7.6 (6.1)	7.4 (6.2)
Accelerometer wear time (hours/day)	623	16.2 (2.8)	16.3 (2.8)
Number of youth per family	623	1.5 (0.7)	1.48 (0.7)

Note.

GED = General Education Development Test; BMI = Body Mass Index; MVPA = Average Minutes/Day of Moderate and Vigorous Physical Activity; SED = Average Minutes of Sedentary Time per day; CESD-10 = Center for Epidemiologic Studies Depression Scale-10 item version.

[a]= Total sample sizes vary slightly across variables due to missing data;

[b]= Highest level of education completed by caregiver;

[c]= Defined as ≥150 minutes/week of moderate activity, ≥75 minutes/week of vigorous activity, or ≥150 minutes/week of total MVPA based on average across adherent days;

[d]= Defined as < 100 counts/minute; average minutes per day of sedentary time in minutes across adherent days;

[e]= Composite index of major comorbidities with one point each for diabetes, cardiovascular disease, obstructive lung disease, cancer);

[f]= Weighted data use sampling weights from SOL Youth to account for differential selection probabilities and non-response.

Table 3

Results of Linear Regression Models Regressing Youth MVPA/SED Time on Caregiver MVPA/SED Time

Regression Model Tested	Model 1[a] B [95% CI]	Model 2[b] B [95% CI]	Model 3[c] B [95% CI]
Overall Sample (N = 877)			
Youth MVPA on caregiver MVPA	1.2 [0.2, 2.2] p = .016	1.0 [−0.1, 2.0] p = .053	1.0 [−0.2, 2.2] p = .100
Youth SED on caregiver SED	2.5 [1.9, 3.1] p < .001	1.4 [0.3, 2.5] p = .001	0.9 [0.3, 1.4] p = .001
Biological Parent Subsample (N = 795)			
Youth MVPA on caregiver MVPA	1.3 [0.2, 2.3] p = .014	1.1 [0.01, 2.3] p = .053	1.2 [−0.03, 2.5] p = .056
Youth SED on caregiver SED	2.5 [1.9, 3.1] p < .001	0.9 [0.3, 1.4] p = .002	0.9 [0.3, 1.4] p = .001

Note.

MVPA = Average Minutes/Day of Moderate and Vigorous Physical Activity, measured in 10-minute increments; SED = Average Minutes of Sedentary Time per day, measured in 10-minute increments.

[a]= Bivariate associations - uncontrolled.

[b]= Controls for youth age, sex, Hispanic/Latino background, and nativity, as well as caregiver age, sex, and nativity, family socioeconomic status (family income; caregiver education), study site, and number of children in the family.

[c]= Controls for variables listed in Model 2 and youth and caregiver depression, youth asthma, caregiver comorbidities, and youth and caregiver BMI.

Table 4

Results of Logistic Regression Models, Regressing Child-met MVPA Guidelines on Caregiver-met MVPA Guidelines

	Model 1[a] OR [95% CI]	Model 2[b] OR [95% CI]	Model 3[c] OR [95% CI]
Overall Sample			
Child met MVPA guidelines on caregiver met MVPA Guidelines	2.0 (1.2, 3.1) p = .008	1.9 (1.1, 3.5) p = .024	1.9 (1.1, 3.3) p = .035
Biological Parent Subsample			
Child met MVPA guidelines on caregiver met MVPA Guidelines	2.2 (1.3, 3.7) p = .005	2.0 (1.2, 3.6) p = .015	2.1 (1.1, 3.8) p = .019

Note.

MVPA = Average Minutes/Day of Moderate and Vigorous Physical Activity, in 10-minute increments; SED = Average Minutes of Sedentary Time per day, in 10-minute increments.

[a]= Bivariate associations - uncontrolled.

[b]= Controls for youth age, sex, Hispanic/Latino background, and nativity, as well as caregiver age, sex, and nativity, family socioeconomic status (family income; caregiver education), study site, and number of children in the family.

[c]= Controls for variables listed in Model 2 and youth and caregiver depression, youth asthma, caregiver comorbidities, and youth and caregiver BMI.