Influence of parental nativity and perceived neighborhood environment on physical activity and screen time of United States youth

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Abstract

Objective: This study assessed how parental nativity and perceived environment are associated with physical activity and screen time of U.S. children and adolescents.

Methods: Data originated from the 2020–21 U.S. National Survey of Children's Health. We conducted multivariable Poisson regression to assess the cross-sectional association of parental nativity and perceived neighborhood environment variables on parental reports of youth meeting national physical activity and screen time guidelines. We tested interactions of parental nativity and neighborhood environment variables on both outcomes. Analyses were conducted using STATA v17 and $p < 0.05$ indicated statistical significance.

Results: The sample of 24,928 children and 30,951 adolescents was 11.6 years of age, on average, with approximately 39% under 200% of the federal poverty level. About one-third of the sample (27.5%) had foreign-born parents. In adjusted models, we found that compared to youth with U.S.-born parents, those with foreign-born parents had a lower prevalence of meeting physical activity guidelines. Youth whose parents reported living in safe neighborhoods had a

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higher prevalence of meeting guidelines for physical activity (children: PR = 1.20 95%CI 1.14, 1.27; adolescents: PR = 1.23, 95%CI 1.14, 1.32) and screen time (children: PR = 1.19, 95%CI 1.13, 1.26; adolescents: PR = 1.16, 95%CI 1.06, 1.28) than youth whose parents reported unsafe neighborhoods. We found similar associations between neighborhoods considered supportive or with many amenities and meeting physical activity and screen time guidelines.

Conclusions: Youth whose parents are foreign-born have a lower prevalence of sufficient activity, and perceived parental neighborhood safety and support may be significant influences on youth physical activity and screen time.

Keywords

Youth; Children; Physical activity; Screen time; Neighborhood environment; Adolescents

1. Introduction

Characteristics of the neighborhood environment can serve as barriers (e.g., litter) and facilitators (e.g., presence of sidewalks) to youth engaging in sufficient physical activity and limiting screen time (Bejarano et al., 2019). Beyond the actual environment's influence on these behaviors, parental perceptions of the neighborhood environment also exert a strong influence on these behaviors in their children (Hunter et al., 2020; Kepper et al., 2019; Parajara et al., 2020). However, not all youth have access to neighborhood environments that are conducive to meeting physical activity and screen time guidelines, and minoritized communities (e.g., Hispanic communities) in the United States (U.S.) tend to live in areas that are less supportive of healthy behaviors (Suminski et al., 2011; Singh et al., 2010; Franzini et al., 2010; Jones et al., 2015). Most foreign-born parents in the U.S. are part of minoritized communities (Passel and Rohal, 2015) while still only composing a small portion of that larger community (Ruther et al., 2018). Little is known about the physical activity and screen time behaviors of the children of foreign-born parents and how those parents' perceptions of the neighborhood influence their children's behaviors. It is possible that given an unknown environment, foreign-born parents may be warier of their children being active outside. Alternatively, they may come from a culture in which children tend to be more physically active outdoors and spend less time indoors using screens. There is a need for more research on the physical activity and screen time behaviors of the children of foreign-born parents and how parental perceptions of the neighborhood may influence their children's behaviors. The purpose of this study was to assess how the perceived neighborhood environment, including neighborhood safety, support, amenities, and detractors, are associated with physical activity and screen time behavior of children and adolescents across the U.S., and how that relationship may differ by parental nativity. We hypothesized that more positive evaluations of the perceived neighborhood environment would be associated with higher levels of physical activity and lower levels of screen time in both children and adolescents, and that the relationship would differ for U.S.-born versus foreign-born parents (no hypothesized directionality).

2. Methods

2.1. Study design & data collection

This cross-sectional analysis used data from the 2020–21 U.S. National Survey of Children's Health (NSCH), collected by the U.S. Census Bureau (Child and Adolescent Health Measurement Initiative (CAHMI), 2023). The sample from NSCH is nationally representative of U.S. youth aged 0–17 years. Households were selected via address-based sampling via a multi-stage probability sampling design and were mailed instructions to access the survey online, with some households also receiving paper surveys. A parent or guardian of the child completed the questionnaire, providing written consent prior to completing. Data from 2020 to 2021 NSCH included responses from >60,000 parents or guardians of youth aged 0–17. Following the inclusion of all sociodemographic and independent variables, we had a final dataset with full data from 55,879 parent or guardians. The institutional review board at UTHealth Houston reviewed this study and deemed it exempt.

2.2. Measures

The questionnaire collected parent-reported data on sociodemographic characteristics, perceived neighborhood environment, and physical activity and screen time behaviors of youth. Sociodemographic variables included parental nativity (parents born in the U.S. or not), sex of youth, age of youth, caregiver(s) employment status, family structure, and highest level of education of any adult in the household. Federal Poverty Level (FPL) was calculated by NSCH, which is done by first pulling the poverty guidelines for the year and family size that are issued by the U.S. Department of Health and Human Services, and then dividing a family's yearly household income by the poverty guideline and multiplying by 100. Resulting categories for this variable were 0–99% FPL, 100–199% FPL, 200–399% FPL, and 400% FPL or greater.

A single item assessed if the child lived in a safe neighborhood. Parents were asked to respond on a four-point Likert scale from "definitely agree" to "definitively disagree". We collapsed "definitely disagree", "somewhat disagree", and "somewhat agree" so that we categorized parents as either strongly agreeing that their child is safe in their neighborhood (i.e., "definitely agree") or not (all other categories). Neighborhood support was assessed with three items that asked if people in the neighborhood help each other out, watch out for each other's children, and know where to go for help in their community if they encounter difficulties. Response options were on a four-point scale from "definitely agree" to "definitely disagree". Parents who responded "definitely agree" to at least one of the items above and "somewhat agree" or "definitely agree" to the other two items were identified as having children who lived in a supportive neighborhood and all other response options were categorized as not supportive. Neighborhood amenities included four items that each assessed the presence of a neighborhood amenity—parks, recreation centers, sidewalks, and libraries—with response options of "yes" or "no" for each item. A dichotomous variable was then created from these items (i.e., neighborhood contained all four items versus all other responses). Three items assessed the presence of a detracting element—litter, rundown housing, and evidence of vandalism (e.g., broken windows, graffiti)—with each item having

a response option of "yes" or "no". A dichotomous variable was then created from these items (i.e., neighborhood had no detracting elements versus all other responses).

Physical activity was assessed with a single item, where parents were asked "During the past week, on how many days did this child exercise, play a sport, or participate in physical activity for at least 60 minutes?". Response options were "0 days", "1–3 days", "4–6 days", and "every day". Those with physical activity every day were labeled as meeting guidelines, and all others as not meeting guidelines (Piercy et al., 2018). Screen time was assessed with a single item that asked parents "On most weekdays, about how much time does this child usually spend in front of a TV, computer, cellphone or other electronic device watching programs, playing games, accessing the internet or using social media, not including schoolwork?". Response options were "less than 1 hour per day", "1 hour per day", "2 hours per day", "3 hours per day", and "4 or more hours per day". Responses were then recoded following screen time guidelines from the American Academy of Pediatrics and the World Health Organization, where two hours or less per day of non-school related screen use was coded as "meeting guidelines" and more than two hours per day was coded as "not meeting guidelines" (Hill et al., 2016).

2.3. Statistical analysis

We first computed summary statistics (mean, percentage, 95% confidence interval) for all study variables and examined the bivariate association between parental nativity and perceived neighborhood environment variables. We then conducted crude and adjusted (youth sex, youth age, FPL, caregiver(s) employment status, highest level of household education, and family structure) multivariable regression modeling to assess the association of parental nativity and dichotomous perceived neighborhood environment variables on youth meeting national guidelines for physical activity and screen time, assessing associations for children (6–11 years) and adolescents (12–17 years) separately. To examine outcomes, we used Poisson regression with robust variance. This allowed for outcomes to be examined via Prevalence Ratios (PR), which supports interpretability over an odds ratio given that the outcome under investigation is common in our sample (Barros and Hirakata, 2003). We also tested interactions of parental nativity with all four neighborhood environment variables (safe neighborhood, supportive neighborhood, neighborhood amenities, detracting elements) by adding a product term to the multivariable model, and removing it if it was not statistically significant. Lastly, we conducted sensitivity analyses for each outcome that included the other outcome as a covariate (i.e., physical activity was included in the screen time model). All analyses were conducted using STATA v17 and $p < 0.05$ indicated statistical significance.

3. Results

The sample of 24,928 children and 30,951 adolescents were 11.6 years of age, on average, and 51% male (Table 1). About 39% of the sample was under 200% of the FPL. About one-third of the sample (27.5%) had foreign-born parents. About 20% of youth met physical activity guidelines and 18% met screen time guidelines. Most of the sample had parents who reported living in a safe neighborhood (67%), supportive neighborhood (57%), and

neighborhood with no detractors (74%). Only 36% of parents reported all four neighborhood amenities. Compared to parents born in the U.S., fewer foreign-born parents reported living in a safe neighborhood (69% versus 62%, respectively) or supportive neighborhood (61% versus 48%, respectively) (Supplemental Table 1). While more foreign-born parents reported all four neighborhood amenities (40%) compared to parents born in the U.S. (35%), fewer, though still a substantial portion of foreign-born parents reported no neighborhood detractors (69%) compared to U.S.-born parents (76%).

In models adjusted for youth sex, youth age, FPL, caregiver(s) employment status, highest level of education in the household, and family structure (Table 2), we found that both children and adolescents of foreign-born parents had a lower prevalence of meeting physical activity guidelines (children: PR = 0.75, 95%CI 0.71, 0.79; adolescents: PR = 0.79, 95%CI 0.73, 0.85), and children of foreign-born parents had a lower prevalence of meeting screen time guidelines (PR = 0.91, 95%CI 0.86, 0.96). Youth whose parents reported living in safe neighborhoods had a statistically significantly higher prevalence of meeting guidelines for physical activity (children: PR = 1.20, 95%CI 1.14, 1.27; adolescents: PR = 1.23, 95%CI 1.14, 1.32) and screen time (children: PR = 1.19, 95%CI 1.13, 1.26; adolescents: PR = 1.16, 95%CI 1.06, 1.28) than youth whose parents reported unsafe neighborhoods. Similar results were found for the association between neighborhoods considered supportive and youth meeting guidelines for physical activity (children: PR = 1.39, 95%CI 1.32, 1.46; adolescents: PR = 1.43, 95%CI 1.34, 1.53) and screen time (children: PR = 1.29, 95%CI 1.22, 1.36; adolescents: PR = 1.37, 95%CI 1.26, 1.49). Adolescents whose parents reported all four neighborhood amenities had a statistically significantly higher prevalence of meeting physical activity guidelines compared to adolescents whose parents reported three or fewer amenities (PR = 1.10, 95%CI 1.05, 1.17). There were no statistically significant associations with detracting neighborhood elements, nor were there statistically significant interactions between parental nativity and neighborhood environment variables. Sensitivity analyses showed that additionally controlling for physical activity in the screen time model, or for screen time in the physical activity model, did not substantially change the results (Supplementary Table 2).

4. Discussion

In this study, we assessed the association between parental nativity, along with the perceived neighborhood environment (neighborhood safety, supportiveness, amenities, and detractors), and physical activity and screen time behaviors of a nationally representative sample of U.S. children and adolescents (Esteban-Cornejo et al., 2016; Duke et al., 2012; Datar et al., 2013). We found that U.S. youth whose parents are foreign-born may have a lower prevalence of meeting physical activity and screen time guidelines. This adds to the limited literature and mixed findings on how parental nativity relates to physical activity and screen time behaviors of youth (Vazquez and Schuler, 2020; Cespedes et al., 2013; Babey et al., 2013). Given a relatively new, less culturally familiar environment, foreign-born parents may be warier of their children being active outside. Additional research will be needed to understand the mechanisms of the association between having a foreign-born parent and physical activity in youth. Moreover, future studies should consider the different domains of physical activity; while parental nativity may influence total physical activity, one study

found that Latino youth with foreign-born parents were more likely to walk to school (transport-related physical activity) (Echeverría et al., 2015). Research with domain-specific physical activity measurement in youth can help disentangle effects.

We found that neighborhood safety and support were both significant influences on the physical activity and screen time behavior of children and adolescents, which aligns with previous literature (Esteban-Cornejo et al., 2016; Duke et al., 2012; Datar et al., 2013; Berge et al., 2022). Lastly, we found that parental nativity did not moderate the relationship between the perceived neighborhood environment and physical activity or screen time of youth. Despite that youth with foreign-born versus U.S.-born parents had a lower prevalence of meeting physical activity guidelines, and they more often lived in environments perceived to be less safe and supportive of physical activity, the relationship between neighborhood environment and physical activity was similar for youth with either foreign- or U.S.-born parents. We had hypothesized that this relationship could differ between U.S.-born and foreign-born parents, although were uncertain of the directionality. Study limitations included response bias from parent-reported data and the cross-sectional study design not permitting causality.

Youth whose parents are foreign-born are less physically active, and perceived parental neighborhood safety and support may be significant influences on physical activity and screen time of U.S. youth. The present study expands the literature of what we know about the perceived neighborhood environment, parental nativity, and youth's physical activity and screen time behavior. Practitioners should consider the cultural appropriateness and both the social and physical environment when designing interventions to promote physical activity and limit screen time in youth.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Data availability

Data will be made available on request.

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Table 1

Summary Statistics for U.S. Children and Adolescents from the National Survey of Children's Health (2021 – 21).

	Children (6–11 years) (n = 24,928)			Adolescents (12–17 years) (n = 30,951)			Total sample (6–17 years) (n = 55,879)		
	%	95% CI		%	95% CI		%	95% CI	
Youth age (mean in years)	8.56	8.52	8.61	14.45	14.41	14.50	11.56	11.50	11.63
Parent nativity									
Born in U.S.	69.52	68.10	70.90	66.93	65.51	68.32	68.20	67.20	69.19
Foreign born	25.90	24.56	27.29	29.00	27.60	30.43	27.48	26.50	28.48
Non-parent guardian *	4.58	3.98	5.25	4.08	3.62	4.58	4.32	3.94	4.73
Youth sex									
Male	51.11	49.76	52.45	50.82	49.52	52.12	50.96	50.02	51.89
Female	48.89	47.55	50.24	49.18	47.88	50.48	49.04	48.11	49.98
Federal Poverty Line (FPL)									
0–99% FPL	16.77	15.67	17.93	17.64	16.53	18.80	17.21	16.42	18.03
100%–199% FPL	21.10	19.93	22.30	21.59	20.40	22.83	21.35	20.51	22.21
200%–399% FPL	29.88	28.68	31.11	29.56	28.41	30.74	29.72	28.88	30.57
400% FPL or greater	32.25	31.11	33.42	31.21	30.17	32.27	31.72	30.95	32.51
Caregiver(s) employment status									
At least one caregiver employed full time	86.26	85.20	87.27	85.80	84.77	86.78	86.03	85.29	86.73
At least one caregiver employed part time	4.86	4.30	5.49	4.96	4.35	5.64	4.91	4.49	5.37
Caregiver(s) unemployed or working without pay	8.87	8.01	9.82	9.24	8.44	10.11	9.06	8.47	9.69
Highest level of household education									
Less than high school	7.47	6.47	8.61	11.25	10.02	12.62	9.40	8.58	10.28
High school degree	19.20	18.06	20.39	19.80	18.69	20.95	19.50	18.71	20.32
Some college	20.35	19.29	21.45	20.78	19.87	21.72	20.57	19.87	21.29
College degree or higher	52.99	51.62	54.35	48.17	46.89	49.45	50.53	49.60	51.47
Family structure									
Married	65.11	63.78	66.43	63.76	62.47	65.04	64.43	63.50	65.34
Not married	6.66	5.92	7.47	5.84	5.20	6.55	6.24	5.75	6.77
Single parent (mother or father)	23.35	22.20	24.54	26.05	24.87	27.28	24.73	23.89	25.58

	Children (6–11 years) (n = 24,928)		Adolescents (12–17 years) (n = 30,951)		Total sample (6–17 years) (n = 55,879)	
	%	95% CI	%	95% CI	%	95% CI
Grandparent household	3.47	2.99 4.03	2.90	2.56 3.29	3.18	2.88 3.51
Other family type	1.41	1.06 1.87	1.44	1.13 1.83	1.42	1.18 1.71
Meeting physical activity recommendations	26.48	25.34 27.64	14.72	13.91 15.57	20.49	19.78 21.21
Meeting screen time recommendations	24.31	23.15 25.50	10.98	10.17 11.84	17.52	16.80 18.26
Safe neighborhood (yes)	66.01	64.67 67.33	67.95	66.65 69.22	67.00	66.07 67.91
Supportive neighborhood (yes)	58.13	56.77 59.48	56.55	55.22 57.86	57.32	56.38 58.27
(all four) neighborhood amenities	36.09	34.81 37.39	36.03	34.79 37.28	36.06	35.17 36.96
(no) neighborhood detractions	74.02	72.73 75.27	74.84	73.59 76.05	74.44	73.54 75.31

*
Child lives with a U.S.-born caretaker that is not their biological parent.

Weighted percentages to account for complex survey design.

Table 2

Adjusted Prevalence Ratio (PR) Models Assessing the Association of Parental Nativity and Neighborhood Environment Variables on Meeting Physical Activity or Recreational Screen Time Guidelines in the U.S. Youth National Survey of Children's Health.

	Children (6–11 years) (n = 24,928)			Adolescents (12–17 years) (n = 30,951)			Total sample (6–17 years) (n = 55,879)		
	PR	95% CI	p-value	PR	95% CI	p-value	PR	95% CI	p-value
Meeting physical activity recommendations									
Parental nativity									
U.S.-born parent (ref)									
Foreign-born parent	0.75	0.71	<0.01	0.79	0.73	<0.01	0.76	0.72	<0.01
Non-parent Guardian	1.19	0.76	0.44	0.58	0.35	0.04	0.86	0.62	0.39
Safe neighborhood									
No (ref)									
Yes	1.20	1.14	<0.01	1.23	1.14	<0.01	1.22	1.17	<0.01
Supportive neighborhood									
No (ref)									
Yes	1.39	1.32	<0.01	1.43	1.34	<0.01	1.40	1.35	<0.01
Neighborhood amenities									
0–3 amenities (ref)									
All four	1.03	0.98	0.22	1.10	1.05	<0.01	1.06	1.02	<0.01
Neighborhood detractors									
1–3 detractors (ref)									
None	0.99	0.94	0.71	1.02	0.95	0.58	1.00	0.96	0.99
Meeting screen time recommendations									
Parental nativity									
U.S.-born parent (ref)									
Foreign-born parent	0.91	0.86	<0.01	0.99	0.90	0.76	0.94	0.89	0.01
Non-parent Guardian	0.77	0.51	0.21	0.67	0.37	0.19	0.75	0.53	0.09
Safe neighborhood									
No (ref)									
Yes	1.19	1.13	<0.01	1.16	1.06	<0.01	1.18	1.12	<0.01

	Children (6–11 years) (n = 24,928)				Adolescents (12–17 years) (n = 30,951)				Total sample (6–17 years) (n = 55,879)			
	PR	95% CI		p-value	PR	95% CI		p-value	PR	95% CI		p-value
Supportive neighborhood												
No (ref)												
Yes	1.29	1.22	1.36	<0.01	1.37	1.26	1.49	<0.01	1.32	1.26	1.38	<0.01
Neighborhood amenities												
0–3 amenities (ref)												
All four	1.00	0.96	1.05	0.86	1.02	0.95	1.09	0.68	1.01	0.97	1.05	0.59
Neighborhood detractors												
1–3 detractors (ref)												
None	1.00	0.95	1.06	0.91	1.03	0.94	1.12	0.56	1.01	0.96	1.05	0.79

Notes: Models include federal poverty level, caregiver(s) employment status, highest level of household education, family structure, youth sex, and youth age as covariates; Weighted percentages to account for complex survey design; Ref = Reference group.