Frequency of Parent-Supervised Outdoor Play of US Preschool-Aged Children

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Objective: To characterize preschoolers’ daily parent-supervised outdoor play frequency and associated factors.

Design: Cross-sectional using data from the Early Childhood Longitudinal Study–Birth Cohort.

Setting: Nationally representative US sample.

Participants: Preschool-aged children.

Main Outcome Measure: Parent-reported outdoor play frequency.

Results: The sample size of 8950 represented approximately 4 million children. Sixty percent of mothers worked outside the home, 79% exercised 0 to 3 days per week, and 93% perceived their neighborhood to be safe. Forty-four percent of mothers and 24% of fathers reported taking their child outside to play at least once per day. Fifty-one percent of children were reported to go outside to play at least once per day with either parent. Fifty-eight percent of children who were not in child care went outside daily. A child’s odds of going outside daily were associated with sex (odds ratio [OR] for girls, 0.85; 95% CI, 0.75-0.95), having more regular playmates (OR for ≥3 playmates, 2.03; 95% CI, 1.72-2.38), mother’s race/ethnicity (OR for Asian, 0.51; 95% CI, 0.43-0.61; black, 0.59, 95% CI, 0.49-0.70; Hispanic, 0.80, 95% CI, 0.67-0.95), mother’s employment (OR for full time, 0.70; 95% CI, 0.62-0.81), and parent’s exercise frequency of 4 days or more per week (OR, 1.50; 95% CI, 1.28-1.75). We did not find significant association of outdoor play with child’s time spent watching television, household income, mother’s marital status, or parent’s perceptions of neighborhood safety.

Conclusions: About half the preschoolers in this sample did not have even 1 parent-supervised outdoor play opportunity per day. Efforts to increase active outdoor play should especially target children who are girls and non-white. Outdoor play opportunities at child care are critical for children of parents who work outside the home.

characterize children who are most at risk for less frequent parent-supervised outdoor time.

**METHODS**

**STUDY SAMPLE**

We used data from the Early Childhood Longitudinal Study–Birth Cohort (ECLS-B), a longitudinal, observational study of a nationally representative sample of 10,700 children born in the United States in 2001. The same children were followed up and information was collected at approximately 9 months, 2 years, preschool (age 4 or a year away from kindergarten), and kindergarten age. The responding parent, usually the mother, was interviewed at each of those ages and, when possible, fathers who resided with the child were also interviewed separately.

At the preschool assessment, both the mother and father were asked about outdoor play frequency: “In the past month, how often did you take [child] outside for a walk or to play in yard, a park, or a playground?” Response categories were: “once a day or more,” “few times a week,” “few times a month,” “rarely,” or “not at all.”

The 9-month through preschool data are currently available through a restricted-use data license, which we obtained. This study was approved by the Seattle Children’s Hospital institutional review board.

**VARIABLES**

Our primary outcome variables were the frequencies with which mothers and fathers reported taking their child outdoors. Parent-reported outdoor play time has been found to correlate significantly with accelerometer-measured physical activity in preschool-aged children. Other variables considered for our analysis included those that might be expected to influence parent-supervised outdoor time based on previous research or a priori hypotheses. These variables included child-level variables (sex, number of playmates, time spent watching television at home [screen time], and child care arrangement), parent-level variables (mother’s race/ethnicity, employment status, marital status, and responding parent’s exercise frequency and perceptions of neighborhood safety), and household-level variables (highest educational attainment in household and household income). Parent-reported screen time has been found to be a valid measure of children’s actual viewing time. There was no information about season or climate in the database.

**STATISTICAL ANALYSES**

All analyses were conducted using Stata statistical software version 10.1 (StataCorp). As the data were collected based on a complex survey design, we weighted all analyses using sampling weights provided in the ECLS-B database for proper inference. All unweighted sample size numbers were rounded to the nearest 50 as required by the ECLS-B restricted-use data license. We conducted χ² tests to examine differences in outdoor play frequency across various child, parent, and household characteristics. We fitted a multivariable logistic regression model and tested the significance of odds ratio estimates using the adjusted Wald test. In our final model, we adjusted for child’s sex, number of regular playmates, screen time, type of primary child care arrangement, mother’s race/ethnicity, mother’s employment status/hours per week worked, parents’ reported exercise frequency, and highest educational attainment in the household. Mother’s marital status and parents’ perception of neighborhood safety were not significantly associated with outdoor play frequency in bivariate and adjusted analyses; therefore, they were dropped from our final model. Household income was excluded owing to issues of colinearity with employment status and highest educational attainment in the household. Hours in child care was excluded owing to high colinearity with the mother’s employment status, child care arrangements, and a large amount of missing values (22%). As a sensitivity analysis, we ran a model using multiple imputation with hours in child care instead of child care arrangement.

Characteristics of the child, parent(s), and household are shown in **Table 1**. By preschool age, more than 80% of children were in some type of nonparental care and spent an average of 28.5 hours per week in their primary child care arrangement. Children’s average screen time of 3.78 hours per day has been previously reported and is higher than other estimates of about 2 hours per day for preschoolers. Most mothers in this sample worked outside the home, exercised 0 to 3 days per week, and perceived their neighborhood to be safe.

Mothers took their children outside to play more often than fathers (**Figure**). Forty-four percent of mothers reported taking their child outside daily compared with 24% of fathers. Fifteen percent of mothers and 30% of fathers did not take their child outside to walk or play even a few times per week.

**Table 2** shows the proportion of children who were reported to go outside at least once per day by child, parent, and household characteristics. Fifty-one percent of parents reported taking their child outside at least once per day with a parent, either the mother or father. We found that 58% of children who did not have a regular child care setting or child care provider (beside their parent) went outside daily. Going outside at least once per day was associated with the child being male and having more regular playmates, as well as the mother’s race/ethnicity and fewer hours worked per week, and parents’ greater exercise frequency. We did not find a significant association of outdoor play frequency with the child’s screen time, mother’s marital status, household income, or parent perceptions of neighborhood safety. Children who went outside to play at least once per day spent a weekly average of 26.47 hours in child care compared with 30.54 hours for children who went outside less than once per day (P < .001).

In adjusted analyses, girls had 15% lower odds of playing outside daily. Having 1 to 2 friends outside of school was associated with 36% greater odds and having 3 or more friends was associated with twice the odds of playing outside daily compared with children who did not have regular playmates (**Table 3**). Asian mothers had 49% lower odds, black mothers had 41% lower odds, and Hispanic mothers had 20% lower odds of taking their child outside daily compared with white mothers. Mothers who worked part time had 18% lower odds and mothers who worked full time had 30% lower odds of taking their child outside daily compared with mothers who did not work outside the home. Mothers who exercised 4 or more times
per week had 50% greater odds of taking their child outside daily than mothers who did not report any exercise. Families for whom the highest educational attainment was more than high school all had lower odds of taking their child outside daily, as did children who attended home- or center-based child care compared with children in no nonparental care. Screen time was not statistically significantly associated with outdoor play in this regression analysis. In a logistic regression analysis using multiple imputation, we included weekly hours at child care instead of child care type and found that the other estimates were essentially unchanged and each additional hour in child care was associated with a 1% lower odd of going outside daily with a parent.

On average, we found that about half of preschool children in this nationally representative sample are not being taken outside to play daily by either of their parents. For children who do not have a regular child care arrangement besides their parents (and therefore, likely do not have other structured venues or care providers to take them outside on a regular basis), 42% did not go outside daily.

Our study shows that preschool-aged girls have 16% lower odds of being taken outside by their parent(s). Parents may make more of an effort to take boys outside owing to societal expectations and norms, or boys may demand more outdoor time. One study of school-aged children found that parents encouraged boys to play outside significantly more than girls.37 The authors of that study also found that greater parental encouragement to spend time outdoors was positively associated with girls’ time outdoors. Girls may also be perceived to have lower athletic ability than boys, therefore, they are taken outside to play less frequently. Loprinzi and Trost38 found that parents’ perceptions of their children’s physical competence was positively associated with parental support for physical activity, which was positively associated with preschoolers’ physical activity at home. Previous research has shown there is a sex disparity in physical activity levels, with boys being more active than girls from a young age39-42 and substantial declines in girls’ physical activity as they get older.43 One philosopher argued that “gendered standards of cleanliness” and play leave girls less exposed to microorganisms commonly found in outdoor environments and may be an explanation for the higher rates of atopic and autoimmune diseases in females.44 Given the association between outdoor time and physical activity and numerous potential other benefits, our findings support giving particular attention to the study and promotion of outdoor play for girls.
supervised outdoor play suggests that logistics and time are important barriers to children playing outside. Children of working parents are potentially going outdoors while at child care, which suggests the importance of outdoor physical activity opportunities in those settings. However, research suggests that activity levels at child care are quite low and preschoolers rarely achieve 60 minutes of recommended moderate-to-vigorous physical activity during the child care day. Parents may assume that their children went outside or were physically active at child care and may not prioritize those activities in the time they spend with their children. Furthermore, more than 40% of children without regular child care arrangements did not have daily parent-supervised outdoor play opportunities. These results suggest that all parents could benefit from strategies that help them provide their preschoolers with more active outdoor play opportunities. The association between the number of friends the child plays with regularly and outdoor play frequency suggests the potential importance of social and neighborhood factors. Perhaps tapping into social and community networks could help parents overcome some barriers to children's outdoor play.

The statistically significant race/ethnicity differences in outdoor play frequency may represent cultural differences that would need to be explored further. The finding that if the mother exercises 4 or more days per week, the child is more likely to go outside daily (when adjusted for the mother's employment status) supports the notion that there may be degrees of outdoor or physical activity tendencies in individuals and those may influence...
ence parents’ own behavior and their support for their children’s physical activities. Cleland et al concluded in a recent study that individual factors (indoor/outdoor “tendencies”) and social factors (eg, social opportunities, parental encouragement, and supervision) were more important predictors of school-aged children’s outdoor time during 5 years than were physical environment factors (eg, facilities, play equipment, and weather). Future research on these individual and social characteristics, how they differ by sex, and the degree to which they are malleable could be important in promoting outdoor time and physical activity.

In one online survey study, 82 percent of mothers with 3- to 12-year-olds cited safety concerns as one of the primary reasons children play outdoors less often today than in the past. However, the ECLS-B data did not support the notion that safety concerns were significant barriers to outdoor play for young children because most mothers stated they felt their neighborhood was very or fairly safe. Other studies have also found that perceptions of a more hazardous neighborhood by children or social disorder by parents were surprisingly not associated with less physical activity or outdoor time in children. In each of the previously mentioned studies, the populations studied were not necessarily comparable and the assessment of neighborhood conditions was done differently. Thus, perceptions of safety are complex constructs and study designs that lead to a better understanding of the true barriers to children’s outdoor time and interventions to change them are needed.

In addition, consistent with previous findings but contrary to popular belief, we did not find evidence that excessive screen time is displacing outdoor activity. This supports the notion that active and sedentary behaviors are not necessarily inversely related and mediating variables need to be examined and targeted separately.

There are some limitations to our study that warrant consideration. First, our outcome of outdoor play time was assessed with 1 survey question. Because the outcome was parent-reported, it may be subject to social desirability bias; however, we would expect that to lead to over-reporting of outdoor play time. Second, because the response options were categorical, we do not know the duration of time that children spent outside nor were we able to add the responses from the mother’s to the father’s to get a cumulative outdoor play frequency with both parents. Third, we did not have information about the season when the data were collected or about geographic differences, which are potentially important with regards to weather and outdoor time, although data were presumably collected throughout the year. Finally, despite the breadth of data available, it is possible that other unmeasured factors exist. However, the large sample size and complex sampling frame meant to capture a nationally representative group strengthen our conclusions and make the data more generalizable. Future studies that better quantify outdoor time, longitudinally examine the relationship between outdoor time and measured physical activity, and study other potential benefits of being outdoors would be important.

The National Association for Sport and Physical Education guidelines recommend at least 60 minutes of physical activity and up to several hours of unstructured play per day for preschoolers. While 3- to 5-year-old children tend to be more active than older children, studies suggest they are not as active as many people believe, and nearly half are not meeting these minimal physical activity recommendations. Influences on children’s physical activity are multidimensional. A review of 24 articles on preschool-aged children showed that boys were more active than girls, children with active parents tended to be more active, and children who spent more time outdoors were more active than children who spent less time outdoors. An indeterminate result was found for weather conditions, television viewing, and ethnicity; economic status did not appear to be associated with children’s physical activity. Thus, being outdoors may be among the most important modifiable factors for young children’s physical activity. However, there is some evidence that merely providing more unstructured outdoor play time may be insufficient to increase children’s physical activity. Social and environmental support factors, including parents’ perceptions and behaviors, would need to be appropriately studied and targeted. Researchers have called for more research “to understand the high correlation between physical activity among preschoolers and outdoor playtime . . . to allow for more research-informed health promotion programs” to help young children meet National Association for Sport and Physical Education physical activity guidelines.

Our results highlight the considerable room for improvement in parent-supervised outdoor play opportunities for preschool-aged children, which could have numerous benefits for young children’s physical health and development. In particular, efforts are needed to increase active outdoor play in children who are girls and nonwhite. For children of parents who work outside the home, focusing efforts and interventions on preschools and child care providers becomes important and necessary. However, as parents are the most important role models and decision makers for their preschoolers, they need to be aided and empowered to provide ample outdoor active play opportunities for their young children. Pediatric clinicians are uniquely positioned to encourage outdoor time for children and families as well as advocate for policy changes that could increase outdoor play opportunities at home and in child care settings.

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