

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

Pooja S. Tandon, MD, MPH; Chuan Zhou, PhD; Dimitri A. Christakis, MD, MPH

**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  $\geq 3$  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.

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**T**HE AMERICAN ACADEMY OF Pediatrics recommends that pediatric health care providers promote active, healthy living by documenting outdoor play frequency and encouraging "children to play outside as much as possible."<sup>1</sup> In part, that recommendation is based on the fact that being outdoors is a strong correlate of physical activity for children.<sup>2-5</sup> Physical activity is protective against obesity in the preschool years,<sup>6,7</sup> tracks through childhood,<sup>8,9</sup> and has a protective effect against early adolescent adiposity,<sup>10</sup> which is correlated with adult obesity.<sup>11</sup> In addition, physical activity promotes cardiovascular, musculoskeletal, and mental health, and it is associated with academic achievement.<sup>12-14</sup>

Preschool children's physical activity does not usually occur as a planned, structured activity. Instead, they have short bursts of vigorous activity that are followed by less-intense recovery periods.<sup>15,16</sup> Young children are likely to achieve physical activity through play,<sup>17</sup>

which is also essential for their growth and development.<sup>18</sup> In particular, outdoor play may also be beneficial for motor development, vision, cognition, vitamin D levels, and mental health.<sup>19-27</sup> In spite of these manifold benefits, US children today likely spend less time playing outdoors than any previous generation.<sup>28-30</sup>

As society has changed, so has the way in which parents spend time with their children. Of all the adults who care for preschoolers, parents (or guardians) likely have the greatest influence on their behaviors because children spend the most time in their care.<sup>31</sup> This is true even for children in child care, as preschoolers in the United States spend an average of 32 hours per week in child care.<sup>32</sup> Therefore, parents' ability and willingness to take their children outdoors can influence children's opportunities for play and physical activity. Therefore, we conducted a study using nationally representative data with the following specific aims: (1) to quantify preschool-aged children's parent-supervised outdoor play frequency and (2)

**Author Affiliations:** Center for Child Health, Behavior, and Development, Seattle Children's Research Institute and Department of Pediatrics, University of Washington, Seattle, Washington.

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.<sup>33</sup> 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.<sup>34</sup> 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  $\chi^2$  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.

## RESULTS

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.<sup>35,36</sup> 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 children were reported to go outside to walk or play 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