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A comparison of parent and child-care provider's attitudes and perceptions about preschoolers' physical activity and outdoor time

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Abstract

Background—Young children depend on adult caregivers to provide opportunities for physical activity. Research has focused on barriers and facilitators to children's physical activity while in child care, but parental influences remain largely unknown. This study examines parent's attitudes about preschoolers' physical activity and outdoor time, compares them to those of child-care providers, and determines the association between parental attitudes and preschoolers' measured activity.

Methods—Parents and child-care providers from 30 child-care centers were surveyed regarding attitudes towards preschoolers' physical activity and outdoor time. Children's moderate-to-vigorous physical activity (MVPA) was determined using 24 hour accelerometry. Parent and child-care providers' responses were compared. Mixed-effects linear regression examined MVPA and sedentary time as outcomes with parental attitudes as predictors, family demographics as covariates, and center as a random effect.

Results—388 parents and 151 child-care providers participated. On average, children were 4.3 (0.7) years old. Parents and child-care providers both considered daily physical activity important for preschoolers, but providers rated the importance of daily outdoor time higher on a 10-point scale (8.9 vs 7.6, $p < .001$). More parents than providers believed that children would get sick by playing outside in the cold (25% vs 11%, $p < 0.05$). Parents were more comfortable with their child playing outside at child care compared to outside at home (8.9 vs 6.9, $p < .001$). Lower income parents felt less comfortable than higher income parents with their child playing outside either near home or at child care. Neither home nor total child activity levels were associated with most parental attitudes queried.

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Conclusions—While parents and child-care providers value daily physical activity for children, some parents expressed discomfort about their young children engaging in outdoor play, especially around home and in cold weather. These findings highlight the importance of child-care based interventions to promote preschoolers' physical activity and outdoor play.

Keywords

sedentary behavior; outdoor play; daycare

Introduction

Physical activity is important for children's health and development, but young children are largely dependent on their adult caregivers to provide opportunities to be outside and physically active.(Davison and Birch 2001) Family support of physical activity has been consistently associated with preschool children's physical activity.(Dowda *et al.* 2011), (Loprinzi and Trost 2010, Sallis *et al.* 1993) Since a large percentage (76%) of U.S. preschool-aged children with employed mothers spend time in some non-parental child care arrangement, with many spending long hours (>35 hrs/week) in those settings, child-care providers also play an important role in children's physical activity levels and opportunities for active play. Indeed, the child-care setting has been shown in numerous studies to be a significant predictor of preschooler's physical activity during their time in care. (Pate *et al.* 2004, Bower *et al.* 2008, Copeland *et al.* 2016)

Previous studies on preschooler's physical activity have focused primarily on the child-care program's policies, environments and child-care provider perspectives.(Dowda *et al.* 2009, Copeland *et al.* 2012, Henderson *et al.* 2015) Previous research also suggests that parents and child care providers may hold discordant views on issues related to physical activity. (Copeland *et al.* 2009) In qualitative studies, child-care providers have identified parent-related barriers including parents not providing appropriate clothing for playing outdoors, parental preference for children to be inside learning, and societal concerns about potential injuries.(Copeland *et al.* 2012, Copeland *et al.* 2009) Child-care centers are businesses that rely on enrollment to remain financially viable; therefore child-care providers may feel pressure to respond to parent's preferences. In a qualitative study in Canada, parents identified child care as both a barrier and facilitator of physical activity for their children. (Irwin *et al.* 2005) Given that young children likely spend considerable time with their parents as well, and that parent-related barriers have been suggested by child-care providers, the role and influence of parents in their preschooler's physical activity needs to be better understood.

In addition to parental attitudes about physical activity, family demographics socioeconomic status (SES)^{16,17} and parental perceptions of neighborhood safety(Tappe *et al.* 2013) have been found to be associated with children's opportunities for physical activity.(Wijtzes *et al.* 2014, Carson *et al.* 2014, Burdette and Whitaker 2005) Parents from lower SES may not feel comfortable providing outdoor play opportunities for their child in their neighborhood, making the child-care setting that much more critical for promoting physical activity. Given high rates of obesity, physical inactivity, and health disparities among children,(Sisson *et al.*

2009, Wang 2011) and since parents and non-parental caregivers both have the potential to influence young children's activity levels, it is important to better understand both perspectives to inform intervention efforts.

The aims of this study were to describe parent's attitudes about preschoolers' physical activity and outdoor time at home and at child care, compare parent responses to child-care providers' attitudes, and determine the association between parental attitudes and preschoolers' measured activity levels.

Methods

Participants & Setting

Participants were enrolled in an observational study of diet and physical activity of children who attended 30 child-care centers in Hamilton County, OH, and additional details about the study have been previously published.(Copeland *et al.* 2016) Centers were eligible if they offered full-day care to preschool age children. Written informed consent was received from the directors at each center and from a parent of each participating child. The Institutional Review Board at Cincinnati Children's Hospital Medical Center approved the study protocol.

Measures

Survey—Ninety-eight percent of respondents were parents so respondents will herein out be referred to as "parents." Parents were asked four questions about their comfort with and the importance of preschoolers' daily physical activity and outdoor time both at child care and at home. They were asked to agree or disagree (on a 5 point Likert scale) with four general statements about their attitudes on how outdoor play may relate to children getting sick and their learning opportunities. Child-care providers completed a questionnaire with the same questions as parents about the importance of preschoolers' physical activity and outdoor time at child care only. The questions about importance of and comfort with physical activity and outdoor time were rated on a 0-10 visual analog scale (0= not important to 10=very important) and analyzed continuously. The items using the 5 point Likert scale were later collapsed into 'strongly agree' vs. other response categories (2 items) or 'strongly disagree' vs. other response categories (2 items). Parents and child-care providers also were asked to report their height/weight, health status, and average weekday sitting time in the past 7 days. The survey included demographic questions including age, race, ethnicity and educational attainment.

Children's physical activity—Children wore Actical uniaxial accelerometers (MiniMitter®, USA) on their hip from the time they arrived at the center on the observation day until their arrival at the center the following day. Data were collected in 15 second epochs and established cutoffs (Pfeiffer *et al.* 2006) were used to quantify minutes per hour spent in MVPA (moderate-to-vigorous physical activity), light activity, and sedentary activity for time at home and at the center. Research staff recorded each child's arrival and departure from the center to determine center versus non-center time. Sleep and non-wear times were removed from these periods based on the times that the parents recorded at home

and research staff recorded at the child-care center. Non-wear time was interpreted as 120 consecutive epochs (30 minutes) with consecutive zero counts. Assessments occurred from November 2009 through January 2011, providing a range of seasons and weather conditions.

Analyses

Parent and child-care providers' survey responses were compared using *t*-tests for continuous variables and the Mann-Whitney test for categorical variables. Based on prior research, we hypothesized that parents' perceptions about outdoor play and physical activity may differ by SES. We stratified responses by socioeconomic status of parent respondents: low-SES families were considered to be those who were eligible for free or reduced-price meals as administered through CACFP (the Child and Adult Care Food Program); others were considered higher SES families. We used *t*-tests to compare responses between families of higher and lower SES on questions regarding comfort with outdoor play at home and at preschool. We used mixed effects linear regression models to examine total and home child MVPA and sedentary time as outcomes with each parental perception as a predictor, controlling for child's age, gender, parent educational attainment and center as a random effect.

Results

There were 404 children that participated in the study and 388 had complete data for this analysis (77% recruitment rate and 90% response rate from parents on the survey). An average of 13.5 children participated per child-care center (range 8-21). One hundred fifty one child-care providers from 30 centers participated (90% recruitment rate) with an average of five child-care providers per center (range 3-9). Child, parent and child-care provider characteristics are described in Table 1. The average parent and child-care provider in this sample were overweight.

Parents and child-care providers both considered daily physical activity to be highly important for preschoolers (Table 2), but child-care providers rated the importance of daily outdoor time significantly higher than did parents (8.9 vs 7.6, $p < .001$). More parents (25%) than child-care providers (11%) believed that children would get sick by playing outside in the cold ($p < 0.001$). Parents were more comfortable with their child playing outside at child care compared to outside at home (8.9 vs 6.9, $p < .001$). When compared to higher SES parents, parents of lower SES felt less comfortable with their child playing outside either at home (7.8 vs 6.2, $p < .001$) or at child care (9.2 vs 8.6, $p < .01$). Very few parents or child-care providers felt that physical activity time took away from learning opportunities.

On average, children wore accelerometers for a mean (SD) of 23.5 (2.5) hours of which 8.4 (1.2) hours were at child care and 15.6 (1.6) hours were at home. At home and at their child-care center, children were sedentary for the majority of the time. At home on average, 67% of their waking hours were spent being sedentary, 31% was spent in light activity and 3% was spent in MVPA. At child care on average, 60% of time was sedentary, 36% light activity and 4% MVPA. Children spent 48% of their awake time at home and accumulated 38% of total MVPA at home. Children engaged in more MVPA minutes per hour at child care compared to home (2.4 vs 1.6, $p < .001$). They also had fewer sedentary minutes per hour at

child care compared to home (36.1 vs 40.4, $p < .001$). Neither child's total nor home activity minutes were significantly associated with most parental perceptions queried when controlling for child and parent demographics. There were associations noted between the parental perception that there are more germs indoors than outdoors and home MVPA ($p = 0.048$) and sedentary time ($p = 0.032$). (Table 3).

Discussion

This study found that while parents and child-care providers both believed daily physical activity is important for children, parents did not value daily outdoor time as highly as did child-care providers. Parents were also more concerned than child-care providers that playing outside in the cold could make children sick. These views corroborate findings of parent-level barriers to children's physical activity from previous studies. (Copeland *et al.* 2012, Copeland *et al.* 2009, Irwin *et al.* 2005) The findings also suggest, however, that parents and child-care providers do share concordant views that physical activity is important and does not take time away from learning. Given that preschoolers are not receiving optimal physical activity opportunities at child care, (Tandon *et al.* 2015) interventions are needed. These findings suggest that parents would be largely supportive of efforts to promote outdoor time and active play opportunities at child care.

As previously suggested, (Wijtzes *et al.* 2014, Lumeng *et al.* 2006, Tappe *et al.* 2013) we saw differences in parental attitudes about outdoor play by socio-economic status. Parents of lower SES were less comfortable with their child playing outside at home or at child care, compared to parents of higher SES. Interestingly, parents in both SES groups felt more comfortable with their child playing outdoors at child care than at home. Furthermore, a previous study found that children who were minorities and girls had lower odds of going outside daily to play with their parents. (Tandon *et al.* 2012) For children who encounter barriers to outdoor play in their neighborhoods, a safe child-care setting is well positioned to decrease disparities in these opportunities.

We did not find correlation between most parental attitudes and preschoolers' activity levels. For children attending full day child care, parents' attitudes towards physical activity and outdoor play may not have measurable influence since they are spending many waking hours in the care of other adults. We did find associations between the parental perception that there are more germs indoors than outdoors and home activity levels, which were unexpected, and point to the need to further understand where children are engaging in activity. Children were primarily sedentary in child care, which is consistent with what others have found even though preschoolers are thought to be quite active. (Irwin *et al.* 2005). (Tandon *et al.* 2015, Pate *et al.* 2008) Despite the overall low activity levels, children were more active and less sedentary at child care compared to home. One explanation of these findings is that much of their time at home, early mornings and evenings after child care, may not be conducive to active play as families juggle weekday routines and priorities. These findings challenge the notion that parents and home environments are the most important socio-ecological context for promoting physical activity in all preschoolers.

Child-care providers and settings therefore deserve attention and support in promoting physical activity. Strategies that involve more provider-led physical activity or encourage child-care provider involvement in children's physical activity may have the secondary benefit of improving the health and weight status of child-care providers of whom the majority was overweight or obese. Engagement with families is another promising strategy to improve children's health and learning.(Henderson *et al.* 2002, Klein *et al.* 2010) With only 2% of parents agreeing with the idea that physical activity takes away time from learning opportunities, there may be greater than previously expected parental support for strategies to increase active playtime. A previous study found however, that almost 80% of preschooler's parents reported no dialogue around the topic of outdoor play with their child-care provider.(Jayasuriya *et al.* 2016). These findings highlight the need to increase communication around and support of physical activity from all of the adults with whom young children interact.

Limitations of this study include that it sampled a single geographic region, which limits the generalizability, however, our sample was racially and socio-economically diverse. Both parents and child-care providers reported giving high importance to children's physical activity, which may reflect social desirability bias. In addition, we collected only one day of accelerometer data.. While a single day is considered inadequate to determine typical physical activity levels, the low percentages of daily MVPA and high percentage of sedentary behavior are consistent with other studies.(Pate *et al.* 2004, Tucker 2008)

In conclusion, for children who spend considerable time in child-care settings, those caregivers and settings are critical for promoting physical activity and outdoor play. This may be especially true for children of lower SES whose parents may not feel comfortable with their children playing outside when at home. Preschoolers' daily physical activity and outdoor time should be supported and encouraged in all the settings where children spend time.

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Abbreviations

PA	physical activity
MVPA	moderate to vigorous physical activity

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KEY MESSAGES

- Parents and child-care providers agree that physical activity is important and does not take time away from learning opportunities.
- Parents of lower SES felt less comfortable letting their child play outside near their home compared to parents of upper SES; all parents felt more comfortable letting their child play outside at child care compared to home.
- Children were primarily sedentary throughout the day, particularly at home.
- There was no correlation between most parental attitudes and preschoolers' measured physical activity levels.
- Both parents and child-care providers would benefit from learning practical strategies to incorporate physical activity into daily routines

Table 1

Child, Parent and Child-care Provider (CCP) Characteristics

	CHILD		PARENT		CCP		
Variable	Mean (sd) or n (%)	N*	Mean (sd) or n (%)	N*	Mean (sd) or n (%)	N*	P-value ^a
Age (y)	4.3 (0.7)	388	-	-	38.1 (12.8)	149	-
Gender (female)	199 (51%)	388	326 (87%)	373	145 (96%)	151	0.003
Race	162 (43%)	374	203 (55%)	370	88 (59%)	149	0.67
White	150 (40%)		146 (40%)		54 (36%)		
Black	62 (17%)		21 (6%)		7 (5%)		
Other and mixed race							
Ethnicity	13 (4%)	372	5 (1%)	373	3 (2%)	150	0.58
Hispanic/Latino							
Household composition			175 (47%)	370	-	-	-
Single parent household	-	-	195 (53%)				
Two parent household							
Highest level of education			70 (19%)	372	11(7%)	150	0.001
HS or Less	-	-	153 (41%)		82 (55%)		
Some college /trade school			149 (40%)		57 (38%)		
Graduated college /higher							
Annual household income			136 (38%)	356		-	-
<25K			82 (23%)				
25-50K			32 (9%)				
50-75K			25 (7%)				
75-100K			81 (23%)				
>100K							
Self-reported health status			63(17%)	372	25 (17%)	151	0.51
Excellent			149 (40%)		49 (33%)		
Very good			128 (34%)		63 (42%)		
Good			28 (8%)		12 (8%)		
Fair			4 (1%)		2 (1%)		
Poor							
Self-reported daily sitting time on weekdays, hours	-	-	7.3 (3.8)	323	6.4 (4.3)	125	0.03
BMI, kg/m ² (self-reported)	-	-	27.5 (6.6)	355	28.2 (6.7)	119	0.37

* This column indicates number of responses for each item as some questionnaires were returned with missing data.

^a p-value indicates comparison of parent and child-care provider (CCP) values, when applicable

Table 2

Parent & child-care provider attitudes towards children's physical activity and outdoor play

	Parent responses	Child-care provider responses	p-value
Importance of physical activity for children every day (0-10 visual analog scale)(SD)	9.3 (1.2)	9.6 (1.1)	0.07
Importance of child going outside every day at child care (0-10 visual analog scale) (SD)	7.6 (2.4)	8.9 (1.9)	<.001
How comfortable to you feel about letting your child play outside near your home? (0-10 visual analog scale) (SE)	6.9 (3.0)	n/a	n/a
How comfortable do you feel about letting your child play outside at the child-care center? (0-10 visual analog scale) (SE)	8.9 (1.8)	n/a	n/a
There are more germs indoors compared to outdoors <i>Strongly Agree</i> <i>Agree</i> <i>Neutral</i> <i>Disagree</i> <i>Strongly Disagree</i>	59(16%) 176(48%) 65(18%) 53(14%) 14(4%)	35(24%) 61(41%) 23(16%) 25(17%) 4(3%)	NS
Physical activity time takes away from opportunities for children to learn <i>Strongly Agree</i> <i>Agree</i> <i>Neutral</i> <i>Disagree</i> <i>Strongly Disagree</i>	3(1%) 4(1%) 14(4%) 204(55%) 143(39%)	2(1%) 1(1%) 3(2%) 80(53%) 64(43%)	NS
Children are more likely to get sick if they spend time outside in cold weather <i>Strongly Agree</i> <i>Agree</i> <i>Neutral</i> <i>Disagree</i> <i>Strongly Disagree</i>	17(5%) 76(21%) 31(8%) 181(49%) 65(18%)	3(2%) 14(9%) 15(10%) 74(49%) 44(29%)	.0002
Children are less likely to get sick if they are physically active on a daily basis <i>Strongly Agree</i> <i>Agree</i> <i>Neutral</i> <i>Disagree</i> <i>Strongly Disagree</i>	118(32%) 164(44%) 43(12%) 31(8%) 14(4%)	40(27%) 80(54%) 20(13%) 8(5%) 1(1%)	NS

Table 3

Children's home and total hour MVPA and Sedentary time in relation to parent's attitudes about PA/outdoor play

	Home MVPA min Coef. (95% CI)	Total MVPA min Coef. (95% CI)	Home Sedentary min Coef. (95% CI)	Total Sed min Coef (95% CI)
PARENT RESPONSES				
Importance of physical activity every day (<i>0-10 visual analog scale</i>)(<i>SD</i>)	0.08 (-0.54, 0.69)	0.57 (-0.46, 1.59)	0.55 (-2.2, 3.3)	0.15 (-4.65, 4.96)
Importance of going outside everyday at child care? (<i>0-10 visual analog scale</i>) (<i>SD</i>)	0.00 (-0.32, 0.32)	0.08 (-0.46, 0.62)	-0.31 (-1.74, 1.12)	-0.72 (-3.21, 1.77)
How comfortable to you feel about letting your child play outside near your home? (<i>0-10 visual analog scale</i>) (<i>SE</i>)	0.16 (-0.09, 0.41)	0.19 (-0.22, 0.6)	-0.53 (-1.64, 0.57)	0.09 (-1.86, 2.03)
How comfortable do you feel about letting your child play outside at the child-care center? (<i>0-10 visual analog scale</i>) (<i>SE</i>)	-0.38 (-0.81, 0.06)	-0.28 (-1.01, 0.46)	0.25 (-1.69, 2.2)	1.02 (-2.34, 4.37)
Strongly Agree vs. any other response				
There are more germs indoors compared to outdoors	-2.00 (-3.98, -0.02)	-2.44 (-5.75, 0.87)	9.65 (0.85, 18.44)	7.9 (-7.56, 23.35)
Physical activity time takes away from opportunities for children to learn	0.26 (-9.8, 10.32)	-2.85 (-16.55, 10.85)	-0.21 (-37.25, 36.83)	6.97 (-57.31, 71.24)
Strongly Disagree vs. any other response				
Children are more likely to get sick if they spend time outside in cold weather	1.04 (-1.01, 3.08)	1.68 (-1.66, 5.03)	-6.59 (-15.51, 2.33)	-14.84 (-30.34, 0.66)
Children are less likely to get sick if they are physically active on a daily basis	-1.16 (-5.01, 2.70)	-3.74 (-10.16, 2.69)	9.77 (-7.35, 26.88)	20.98 (-8.88, 50.84)

* Beta coefficients in a model adjusting for age, gender, parent education, wear time at the specified location, with clustering by center accounted for as a random effect