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# Physical activity in child-care centers: do teachers hold the key to the playground?

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## Abstract

Many (56%) US children aged 3–5 years are in center-based childcare and are not obtaining recommended levels of physical activity. In order to determine what child-care teachers/providers perceived as benefits and barriers to children's physical activity in child-care centers, we conducted nine focus groups and 13 one-on-one interviews with 49 child-care teachers/providers in Cincinnati, OH. Participants noted physical and socio-emotional benefits of physical activity particular to preschoolers (e.g. gross motor skill development, self-confidence after mastery of new skills and improved mood, attention and napping after exercise) but also noted several barriers including their own personal attitudes (e.g. low self-efficacy) and preferences to avoid the outdoors (e.g. don't like hot/cold weather, getting dirty, chaos of playground). Because individual teachers determine daily schedules and ultimately make the decision whether to take the children outdoors, they serve as gatekeepers to the playground. Participants discussed a spectrum of roles on the playground, from facilitator to chaperone to physical activity inhibitor. These findings suggest that children could have very different gross motor experiences even within the same facility (with presumably the same environment

and policies), based on the beliefs, creativity and level of engagement of their teacher.

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## Introduction

The alarming rise of childhood obesity rates over the past three decades [1, 2] has prompted medical and public health professionals to call for increased prevention efforts, particularly among elementary and preschool-aged children, where such efforts may hold the most promise [3–8]. In the same time frame, the proportion of preschool-aged children being cared for outside of their home has escalated. Recent estimates are that 75% of US children aged 3–6 years are in some form of childcare and 56% of those children attend child-care centers [9].

Obesity is related to lower physical activity levels and greater sedentary behaviors [10–16]. Moreover, like the risk for obesity [17–19], physical activity habits are established early in life and track over time [20, 21]. Thus, it is imperative to promote physical activity among preschool-aged children, for both obesity prevention and for establishing lifetime healthy physical activity habits.

For preschool-aged children, physical activity also allows for the development of fundamental gross motor skills [22–24]. Children who develop motor skills earlier are more apt to be active, and

thus, these behaviors are mutually reinforcing [25]. Physical activity has also been associated with numerous other long-term health benefits, including improved blood pressure, blood cholesterol profiles and increased bone mineral density [26–31], as well as mood and cognitive benefits such as decreased anxiety, depression and aggression and improved attention [31–36], self-esteem, mood [26, 31, 37] and social interaction skills [38].

In spite of the importance of physical activity for preschoolers, many of these young children are not obtaining adequate levels of moderate and vigorous physical activity in child-care settings [6, 7, 39–42], perhaps contributing to the increasing rates of obesity among US children [3, 10, 43, 44]. In fact, recent studies have found that in child-care children are only vigorously active for 2–3% (12–46 min) of their 6 hours day excluding naps and meals and sedentary for most (70–83%) of their time [6, 7, 39]. We have reported that center schedules for outdoor gross-motor play vary widely (range 17.5–120 min), that this time can be substantially curtailed due to inclement weather and that individual teachers sometimes make decisions about what constitutes inclement weather [45]. Others have reported that children in child-care centers obtain varying amounts of physical activity, and the amount is primarily dependent on the aspects of the individual center the child attends [7, 39, 46, 47]. The question of why activity levels vary so much across different child-care centers is currently an area of scientific inquiry. Recent studies have highlighted the importance of environmental factors at the child-care center, including time spent outdoors [46, 48, 49], the amounts and types of playground equipment [47, 49, 50], playground size and surfaces [47, 51], integration of shrubbery into the playground [52] and children dressed inappropriately for play [53]. Several studies have illuminated the importance of teachers' behaviors toward children's physical activity on the playground, including positive or negative prompts and modeling [6, 54, 55] but these studies have not explored the teachers' underlying attitudes about children's physical activity or the playground. A better understanding of teachers' underlying attitudes that contribute to their behav-

ior around children's physical activity, including perceptions of benefits and barriers to children's physical activity, may provide insight about potential ways to increase children's physical activity levels. This is particularly important if individual teachers make daily decisions about when and how long to use the playground.

The purpose of this qualitative study was to determine what child-care teachers/providers perceived as the primary benefits and barriers to children's physical activity in child-care centers. We chose qualitative inquiry to allow us to uncover and describe the underlying practices and beliefs of current child-care staff. This formative research was undertaken in order to generate hypotheses that could be tested in a subsequent observational study about the primary environmental determinants of children's physical activity in childcare.

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## Materials and methods

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We conducted nine focus groups with 49 child-care teachers/providers between August 2006 and June 2007, and 13 one-on-one interviews in the spring of 2008; nine interviews were member-checks with former focus group participants, four interviewees were new—they were recruited in the original sample for the focus groups but were unable to attend any of the sessions. We used maximum variation sampling [56, 57] and utilized the assistance of several community agencies in order to recruit a heterogeneous convenience sample of child-care teachers, thereby securing a small sample of great diversity. Specifically, we targeted recruitment of teachers from different ethnic backgrounds and with a range of years of experience. Moreover, we recruited those who worked in both suburban and urban centers, those which served both low-income and upper-income children and incorporated a range of philosophies and affiliations (e.g. Montessori, Head Start, church-affiliated, YMCA, worksite- or University-affiliated and corporate/for-profit centers). Child-care providers were eligible to participate if they currently worked or had worked in a full-day

child-care center in Hamilton County (Cincinnati area), Ohio within the past 3 years. Furthermore, no more than one participant per child-care center was eligible to attend each focus group, so that minimized the chances that certain focus group members knew one another, which could make other focus group members feel uncomfortable and hamper the free-flow of ideas [58]. Of the 49 focus group participants, 27 (55%) identified themselves as black/African American, 48 (98%) were female and 44 (90%) had at least some education beyond high school. Participants had worked in child-care settings an average of  $13 \pm 9$  years (range <1 year to 37 years). Focus group participants came from 34 centers that were well distributed geographically throughout the county including 13 centers located in low-income US Census tracts (median income less than 50% of median income for the local metropolitan statistical area). The types of child-care centers were also diverse, including five Montessori, six Head Start, two church-affiliated, two YMCA, four worksite-affiliated and three corporate/for-profit centers. The four interview participants who had not been able to participate in the focus groups came from three additional centers.

All focus groups were led by a trained focus-group moderator (S.N.S.), attended by the lead investigator (K.A.C.) and were audio-recorded and transcribed verbatim. They lasted on average 1.5 hours. The focus group topic guide (Table I) used a balanced set of broad open-ended questions to probe participants' perceptions of both the benefits and barriers to children's physical activity in child-care centers. The focus group topic guide was modified slightly after each session, which allowed for exploration of new themes and clarification of items brought up in each previous group. A consensus was reached by two investigators (K.A.C. and S.N.S.) that thematic saturation had been reached by the end of the ninth group (no new themes or ideas were emerging from the sessions) [56, 58], thus sampling was discontinued.

Data analysis of the focus group transcripts proceeded in a collaborative reflective style. We used

an inductive approach [57] whereby we looked for patterns, themes and categories in our data, without applying any pre-conceived constructs, hypotheses or theories to the process of interpretation. Thus we identified, categorized, coded and labeled the primary patterns of ideas that emerged from the verbatim comments contained in the transcripts of our focus groups. Transcripts were systematically read and reviewed independently by three investigators (K.A.C., S.N.S. and C.A.K.) trained in qualitative analytic methods and from different fields (pediatrics, social science research and child-care center employment). The three investigators agreed on an initial set of codes and organizing framework (codebook). Next, this set of codes was used to analyze and code transcripts from the focus groups. Three investigators independently coded the transcripts, meeting after each one to resolve any differences in coding by consensus.

To enhance the completeness and credibility of the data analysis and interpretation of the findings, 13 individual interviews were conducted subsequent to the focus group transcript analysis. The use of member checking methodology provided an additional round of data collection and analytical triangulation. Each interviewee was asked a series of questions about physical activity at their center and also was asked to critique the list of themes generated from the analysis of the focus groups and/or to provide additional insights and supporting experiences. Interviews were held in a private room either in the subject's home or workplace, lasted on average 1 hour, were audio-recorded, and led by either S.N.S. or K.A.C. The audio recordings of the personal interviews were reviewed to assess the degree of substantiation of the preliminary interpretation of the findings, disagreement with the inclusion of particular themes, and identification of any new themes. This step allowed participants to assess the accuracy and completeness of the data analysis [57]. All interviewees provided written informed consent to participate. This study was approved by Cincinnati Children's Institutional Review Board and all participants received \$25 remuneration.

**Table I.** Sample questions used in focus groups that elicited comments about teachers' perceptions of the benefits and barriers to children's physical activity in child-care centers<sup>a</sup>

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1. What are some types of activities that children in your center engage in that **increases their heart rate?** (including indoor and outdoor games)
2. What **types of games** do you enjoy most playing with the children **outside** (all games, not just active games)?
3. What **types of games** do you enjoy most playing with the children **inside** (all games, not just active games)?
4. How are **outside games** different than **inside games**?
  - Which do you enjoy more? Why?
  - How are **outside rules** different from **inside rules**?
5. What are some possible **benefits** to children being outside?
  - **Probe on whatever they mention**, (*expect*: a learning tool, exposure to nature, calming tool, health promotion or preventing illness)
6. What are some possible **disadvantages** to children being outside?
  - **Probe on whatever they mention**, (*expect*: catching a cold/getting sick, less control over the children or perhaps teacher doesn't like going outside)
7. In your opinion, **what is the role of physical activity or active play in childcare?** (**Clarification:** ) How important do you think it is for the children? (*probe on whatever is mentioned and encourage participants to react to what others have said*)
8. Now **think about some of the other child-care providers and teachers at your center**, or that you have worked with in the past. How do your opinions about children's physical activity in child care compare with theirs? (**Clarification:** *if participants are mostly in favor of and encouraging of physical activity in children, do they think their opinions are shared by others?*)
  - Have any of you ever disagreed with another teacher or director about children's physical activity while in the center? If so, tell me about what happened and how you handled it.
9. What are some things you like/dislike about your **playground**? What about the children, what do they like/dislike about the playground?
10. What **types of things keep you from using your playground** sometimes? *Probe on the following in whatever order the participants mention them*
  - What types of **weather** keep children from going outside or using your playground?
11. What kind of **policies** does your center have about using the playground, including **weather conditions**, playground **schedule**?
  - For those with **and** those without weather policies, how is the decision usually made about whether or not to take the children outside? (e.g. left up to individual teacher discretion, or the director decides?)

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<sup>a</sup>For each of the questions, non-specific and non-leading probes were used to follow up on any ideas expressed. Examples of these probes were 'Tell me more about that' or 'Can you provide an example?'.

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## Results

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A total of four overarching themes related to physical activity and outdoor play in childcare were identified by group consensus, including: (i) benefits, (ii) disadvantages, (iii) facilitators and (iv) barriers. These overarching themes were subdivided into those that related to children, parents, teachers, structural, policy and societal factors. Results related to the primary disadvantage of active and outdoor play—children getting injured or dirty—and barriers associated with children and parents, including inappropriate children’s clothing, have been reported elsewhere [53]. Themes related to structural, societal and policy benefits and barriers to physical activity and outdoor play will be presented in a separate paper. This paper will report on the three broad categories of findings related to teachers, namely their (i) perceived benefits of physical activity and outdoor play, (ii) perceived disadvantages/barriers to physical activity and outdoor play and (iii) decisions regarding outdoor play and their roles on the playground.

One-on-one interviews conducted during the member-checking component of this study did not produce any additional or conflicting information related to barriers and benefits of physical activity. Interviewees corroborated the preliminary interpretation of the findings including the inclusion of all preliminary themes, and no disconfirming evidence was found. To eliminate over-reporting of themes or over-representation of comments from the nine participants that participated in both interviews and focus groups, only quotations from the focus group transcripts are used in the reporting of our results.

### Teachers’ perceived benefits of physical activity and outdoor time

Participants noted numerous benefits of physical activity, outside time and fresh air (Table II). Benefits fell into two broad categories that were often inter-related physical and socio-emotional. For instance, they noted that the energy expenditure associated with physical activity could help prevent childhood obesity (¶A1,¶A2) (a physical benefit) and could also provide a ‘stress-relief’(¶A4) and

improve children’s mood (¶A5) (emotional benefits). They noted that structured activities (¶A6) and regular physical activity help build healthy habits (¶A1, ¶A3) and could help them calm the classroom down (¶A6, ¶A7).

Sometimes the socio-emotional benefits were seen as integrated with or consequences of the physical benefits. For instance, most participants felt that physical activity was important in the pre-school age group for developing individual gross motor skills, such as climbing, ball skills, coordination, pedaling and hopscotch (¶A8, ¶A9, ¶A10). Several participants noted that children who master gross motor skills at an early age tend to become more self-confident than other children. Mastery of gross motor skills fostered feelings of self-efficacy (¶A12, ¶A14) and ultimately improved self-esteem (¶A13, ¶A14). Similarly the converse was true: some participants had encountered a few children who never learned to perform fundamental skills such as skipping, climbing or throwing a ball (¶A15, ¶A18). Children who cannot perform these skills may begin to feel embarrassed and discouraged (¶A15, ¶A16, ¶A18) and have difficulty with their peers. Without the opportunity to practice, failure to learn these skills at an early age could place children on a trajectory in which they never feel comfortable doing physical activities (¶A17). Participants noted that in contrast to exercising indoors in a gross motor room, going outside provided additional physical benefits of more room to run and expend energy (¶A19, ¶A20, ¶A21). This increased freedom to run was also interpreted on a socio-emotional level, as participants noted that children felt freer to raise their voices and express themselves (¶A21, ¶A24, ¶A27) outdoors and that children seemed more creative outdoors compared with indoors (¶A25, ¶A26). Playground schedules that allowed children to interact with children from other classrooms helped to foster children’s new friendships and social development (¶A27, ¶A28, ¶A30). Participants also remarked that the limited quantity of playground equipment such as balls or slides could facilitate the development of children’s problem-solving skills as they must negotiate shared usage of items in limited

**Table II.** *Teacher's perceived benefits of physical activity and outdoor time*

	Physical benefit	Socio-emotional benefit
Physical activity	<p><b>Healthy habits, obesity prevention</b></p> <p>¶A1: I think (physical activity) builds healthy habits. There was just a huge study about childhood obesity and how in 10 years it is going to sky rocket. There is no better time than when they are just learning to walk or developing their gross motor skills to get them out moving so they can see that running around and moving around and participating in group activities is fun and they can hopefully build on that as they get older.</p> <p>¶A2: I think getting the exercise and really trying to keep some of the childhood obesity down by being outside, getting that exercise... . Very rarely when you visit a playground you'll see a group of kids just sitting. Usually if they are sitting, they're digging. They're still using muscles somewhere.</p> <p>¶A3: We (teachers) encourage, if they sit around, that is encouraging them to be lazy. And they're not active. We encourage them to be active that will help them, not just now, but as they grow up. Socially and physically they are going to be more active. So I think, I think our role is to encourage that.</p> <p><b>Developing fundamental gross motor skills</b></p> <p>¶A8: Physical activity builds the body itself. It helps them to learn about their legs, their feet, what they can do with them.</p> <p>¶A9: Some are just learning to pedal or they need encouragement as to how to get their legs to go around and push the pedals. I had a little girl that's in occupational therapy and her therapist needed for her to use the climber as much as possible so that she could know how to walk up and down.</p> <p>¶A10: We show them how to play hop scotch because none of these kids now ... they don't know how to do it. We had to show them how to do it.</p>	<p><b>Stress-relief, energy-release, calming</b></p> <p>¶A4: Because people have the misconception that children's aren't stressed. They go through the same things we go through. We just stress about bills, they stress because Susie doesn't want to be my friend today. It's a stress relief. They can just kind of be open and be themselves.</p> <p>¶A5: I think kids are like adults. When we run around and jump and get our energy out and exercise, it releases endorphins and I think they have the same thing. It is a thing that makes them feel better.</p> <p>¶A6: If I am reading to a small group of children and more and more start coming over and they start getting fidgety, I will say, 'Oh guys, we gotta get the wiggles out'. Then we will stand up and I will have them do all these things, like clap your hands above your head, do arm circles... . The kids love it and it gets all the energy out. It's just fun. I like it.</p> <p>¶A7: It just may be 10 min... . that can make their day so much better. It makes them easier to calm down... they have that energy that they need to get out.</p> <p><b>Self-efficacy, self-confidence, improve peer relations</b></p> <p>¶A12: We have the fire pole and there are so many kids when they first started the daycare and they are so scared to go down the pole. Then they say 'Ms. ____, I did it!!' They are so excited when they get up enough confidence to fly down that pole.</p> <p>¶A13: I believe their self esteem is enhanced by being involved in those type of activities... I see them on the playground and it's like, 'It's great being me 'cause I can run and I can jump. I can fall and get up and still keep going. And I have many friends and life is good!!'</p> <p>¶A14: I think it also gives those kids who might not feel as accomplished with things inside, even on an academic level, they might be very accomplished outside with their physical ability and so</p>

**Table II.** *Continued*

Physical benefit	Socio-emotional benefit
<p><b>Converse: without the opportunity to develop gross motor skills</b>                      ¶A11: Like I'll have kids in my class that just cry—'cause you know they're 4—and they'll say, 'I can't skip'. 'You know, it is something you have to learn'. Most of the time you know it's step, hop, step, hop but unless you practice it or learn it.</p> <p>¶A18: If you have a child who is overweight or who is very uncoordinated, they can't play the things the other kids are playing. They get discouraged and they don't want to try. They see all the other kids up on the monkey bars and flipping upside down and he just can't pull his weight up that much. Then he quits and is embarrassed and doesn't want to try. Or a child who is just not coordinated or is developmentally behind the others and they get real discouraged because they can't do what the others do.</p>	<p>they get to rise and shine, like she was saying... They feel more confident about their physical ability than they might about their abilities that shine inside.</p> <p><b>Converse: feeling discouraged and embarrassed</b>                      ¶A15: Kids can get very upset when they can't do something physically that they feel their friends can do. It is more important maybe to the children than it is to the parents... .</p> <p>¶A16: If a child is lacking in that, a lot of times they have problems with their peers. Because then they can't throw a ball and someone else can and then as they continue to get older they get made fun of or they get left out.</p> <p>¶A17: Children who have not had enough active play, especially outdoors, wind up, I think, having emotional difficulties, learning difficulties, social difficulties. So it's extremely important that they are active everyday between the ages of 3 and 6.</p>
<p><b>Outside benefit</b></p> <p><b>More room to run</b>                      ¶A19: Our inside is like a limited space ... When you get outside, there is much more freedom, more space so they can be more active.</p> <p>¶A20: They are able to expend their energy. Inside, I notice on rainy days, that the muscle room just doesn't seem to be enough as going outside.</p> <p>¶A21: It's better because there is more room for them to run. They can scream louder, you know, and they are able to open up more.  <b>Nap better later</b></p> <p>¶A22: If we have a 15–20 min space for outside time, nap time goes a lot better.</p>	<p><b>More creative, expressive</b>                      ¶A24: They can be loud. You're not telling them to use their inside voices. You know, they just have more room to be free and express themselves.</p> <p>¶A25: I think with preschoolers you get a different kind of play. Inside ... it's a much more confined and small-motor kind of thing ... Outside all of the sudden their movements are different... . They start assigning roles that they don't assign inside as much. You kind of see a different theme emerge as they go outside... . They were much more creative and much more into their roles than when they were inside the classroom.</p> <p>¶A26: I agree. There's a lot more creativity, like freedom. There was this one girl who was using a stick to write. The creativity expands when you go outside.</p>

Table II. *Continued*

	Physical benefit	Socio-emotional benefit
	<p>¶A23: When I take my kids outside, they like to go outside and it helps them sleep. When it's nap time, it helps them sleep. It does! I don't have no problems. I don't have to say "lay down!". They just lay down and go right to sleep to sleep.</p>	<p><b>Interact with other classrooms, develop social skills</b></p> <p>¶A27: I think it gives the children a chance to interact. They interact a lot more and they come out of themselves a lot more outside because they have the room... They encourage each other a lot more outside.</p> <p>¶A28: And it's a different kind of social interaction with the kids. Like, they'll play with kids they don't even play with indoors. So it's just a freer way of playing, I think.</p> <p>¶A29: What I observe is that children get a chance to improve, to add to their social skills 'cause they interact with other children. I'm not the only one in the class or the playground. There are other 3–5-year-old rooms out there so you have to learn to stand in line, to wait your turn to go down the slide, . . . We don't have a ball for everybody we have to share the ball... 'Learn to balance your emotions. Play with others'.</p>
	<p>¶A30: (Children's physical activity) is a necessary element as far as what we were saying earlier, their muscle development and their balance and I think there is a lot of social development that goes along with it too. Conflict resolution, trying to solve problems over equipment or doing a group activity or something like that. Not just muscle development but social development also.</p>	
<b>Fresh air</b>	<p><b>Escape germs</b></p> <p>¶A31: We try to take them outside. Just to get that fresh air. I think it helps to kill the germs.</p> <p>¶A32: I think our children in our center—teachers and everyone—are healthier when they go outside because the germs are getting a chance to breathe and they're getting a chance to get some different air, not necessarily the air that's been breathed in and exhaled all day long by the same people.</p> <p>¶A33: Because the fresh air ... I open the windows, too, 'cause it circulates the germs out of the room. I'm a germophobe, I'll admit it. When we're outside, if you sneeze into the grass, you know, that's</p>	<p><b>Improved mood of children and teachers</b></p> <p>¶A36: I would say just that fresh of, that breath of fresh air. You know, just like 2 days last week it was like 70-something—I mean corporate women pushing strollers down the street, just happy to be outside 'cause the sun was shining! ... When we get out and hit outside, 'Wooh!' its like a breath of fresh air!</p> <p>¶A37: I think it makes them feel better, too, to get the fresh air. Maybe not just healthier but then their frame of mind is a little bit different from being outside.</p> <p>¶A38: The sun, I mean, mood, and then the getting you get vitamin D (when asked by moderator to clarify what she meant by 'mood') Well I think of myself. If I'm having, like a stressful day and I go</p>



**Table II.** *Continued*

Physical benefit	Socio-emotional benefit
<p>fine. You're not sneezing on a whole pile of books and, you know, (on to) toys that need to be disinfected.</p> <p>¶A34: (in response to previous speaker) That's pretty much the same thing I was thinking. Even in the wintertime, as long as the temperature is the way it should be, I'll take my kids outside for 15 min. Just so, like she said, I will open the windows and air out the room. Get all those germs out of there 'cause they're spreading in the winter more ... 'cause the heat's on and the heat keeps them multiplying.</p> <p>¶A35: (another respondent in response again) I feel the same way. In the wintertime ... We go outside at least 15 min if the temperature is 33 and above ... And I feel that the outside ... they are not as likely to get sick because the germs are not confined. In the classroom, the germs are just hanging there. Outside I think the germs will just float away more. I think they're less likely to get sick.</p>	<p>outside, it's so much better! And you know, I think daycare in general is more stressful, because the kids are there a long time. You know what I mean? It's a long time for somebody who is little. It's kind of—it's like a change of pace. You know what I mean? You're doing something different.</p>

supply (¶A29, ¶A30). Lastly, participants found that even brief exposures to the outdoors seemed to help children nap better later (¶A22, ¶A23).

An additional important quality of outside time mentioned was ‘fresh air’. Fresh air conveyed both the physical benefit of escaping germs, which were seen as being more prevalent indoors especially during the winter (¶A31, ¶A32, ¶A33, ¶A34, ¶A35) and the emotional benefits of improved mood for both teachers and children (¶A36, ¶A37, ¶A38). In summary, the benefits of being outdoors exceeded those of indoor active play for all the realms discussed gross motor skill development, socialization, health and mood. Further, being outdoors allowed for greater energy release, more vigorous activities, freedom and creativity and social interaction.

### **Teachers’ perceived disadvantages and barriers to children’s physical activity and outdoor time**

While participants listed many benefits of physical activity and outdoor time, they also noted a few disadvantages and several barriers to children getting physical activity (Table III). One disadvantage to outdoor time was the perception that children could get sick (¶B1, ¶B2, ¶B3), especially if improperly dressed for cold or wet weather, although participants said this belief was more common among parents than teachers.

Adverse weather conditions—which could include precipitation, cold, extreme heat or smog warnings—were cited by virtually all participants as a common and important barrier to children’s outside time (¶B4). Yet most participants went on to say that teachers’ perceptions of the weather conditions were more important than actual conditions in determining whether children were permitted outdoors and how long they spent outdoors (¶B5, ¶B6, ¶B7, ¶B13). In fact, many participants acknowledged that it was usually the adults (teachers or parents) and not the children that were bothered by most adverse weather conditions (¶B11, ¶B12, ¶B13). Individual teachers’ preferences or beliefs about weather conditions (e.g. not being a cold weather person (¶B8), not liking the rain (¶B9), or associating dampness with getting sick (¶B1, ¶B10)) could keep children indoors.

Other less frequently mentioned reasons for teachers avoiding the outdoors included not liking the outdoors, (¶B14), getting dirty or sweaty (¶B15), insects (¶B16) and the chaos and noise on the playground (¶B17, ¶B18). Several commented on how much work it was to take children outdoors, including helping children put on coats and mittens (¶B19), administering sunscreen (¶B20), setting up and properly stowing portable equipment on the playground (¶B21, ¶B22) or supervising a challenging playground structure.

Lastly participants mentioned their own ailments, such as allergies and asthma (¶B23, ¶B24, ¶B25) or being overweight (¶B22, ¶B26), as possible impediments to taking the children outdoors and encouraging their physical activity. Many had worked with colleagues they perceived as ‘lazy’ (¶B27, ¶B28). Participants suggested that some teachers may feel self-conscious about their bodies or their physical activity skills and/or lack the self-efficacy to effectively encourage children’s physical activity and their confidence to participate in children’s games (¶B29). A few suggested that perhaps this was due to a negative experience the teacher had had on the playground as a child (¶B30).

### **Balancing benefits and barriers and decisions whether to go outdoors**

Participants weighed both the benefits and barriers to outdoor play in making the decision whether to take children outdoors (Table IV). Most said it was up to the individual teacher whether or not children went outside (¶C1, ¶C2, ¶C3).

### **Teacher as gatekeeper**

Because teachers were empowered to make this decision based on individual preferences, teachers perceived that they could and did serve as gatekeepers to outdoor play. Below a participant describes the ‘pull’ (¶C4) a teacher can have in deciding not to go outside for personal reasons. Another two participants describe how a teacher can override the center’s schedule for personal reasons (¶C5, ¶C6). Assistant or junior teachers often deferred to senior teachers (¶C7). In extreme cases, participants described

**Table III.** *Teacher's perceived barriers to going outside/active play*

Barrier	Example Quote
Parents' concerns about child getting sick from cold weather	<p>¶B1: Oh, they (the parents) tell me, 'The baby was coughing last night, didn't feel too good so I appreciate you all not taking him out today'. So we kind of take that into consideration. If a child is not feeling good.</p> <p>¶B2: The cold weather, the parents think the cold weather gives the child a cold... Some of them, their child will be absent. They say, 'They get colds quick'. But, (to the parent) 'You brought them in the building this morning and (so) they go outside for 15 min, they're not gonna get the flu'.</p> <p>¶B3: I think the cool air. In the wintertime, (imitates a parent saying) 'Oh no, don't go outside because it's cold outside'. I think a lot of people have the misconception that you are going to get sick if you go outside in cold weather. Really, it's better for you.</p>
Teacher's beliefs and preferences re: weather	<p>¶B4: No if it's 90° there's no way they can be outside for no whole hour in 90°. They couldn't take that... I mean we look at it like this: yes, they do need outside time but you have to think about health issues also while you outside.</p> <p>¶B5: Teachers don't want to stay out there long enough because of the weather. 'It's too hot for me'.</p> <p>¶B6: I am the assistant teacher in my room. The lead teacher says, 'It's too hot. You want to take them outside? It's the middle of summer!' And I'm like, 'Yep!!'</p> <p>¶B7: It's not a certain wind chill. It's just what you think. If it's a little too cold when I'm walking in the door, I'm not taking my kids out if the wind is blowing me out. It's gonna blow my kids!</p> <p>¶B8: I just always write in my December newsletter, 'I am not a cold weather person. We will not be going outside if the weather is cold!' So we really don't, I don't really take them outside probably December, January, February unless we have a warm day because I am just not a cold weather person.</p> <p>¶B9 Rain. We are allowed to stay out there, it's up to the teacher. Sometimes the teacher feels a sprinkle, 'OK, it's time to go in'. I wait until I feel a couple of more sprinkles</p> <p>¶B10: In damp weather, I don't think they should be out. When it's getting ready to rain, I think that's probably the worst time I think cold is better than the damp.</p> <p><b>Teachers' negative attitudes contrasted to children's favorable impressions of adverse weather conditions</b></p> <p>¶B11: They (the children) love it in the rain, they love it in the snow. Weather don't really bother the kids.</p> <p>¶B12: They love it in all ways. When you don't want to be out in the cold, they want to be outside.</p> <p>¶B13: I know I have been outside and thought, 'Ooh, I'm cold!' So I know they're cold. So I'm like, 'Y'all ready to go in?' And they're still running around, 'No!!!' 'Yes you are, because I'm freezing!'</p>
Don't like going outside, getting dirty/sweaty, insects	<p>¶B14: When I first started in childcare working in Head Start ... I asked the teacher you know, 'When do we go outside?' (she said) 'Oh, (pause) well, we don't have to go today. We can go tomorrow'. Tomorrow comes, (I asked) 'When are they going outside?' (She said) 'You know, to tell you the truth, I really don't care for going outside'.</p> <p>¶B15: I had a teacher, she told me she had been working there for 20 years or something like that... And she hated outside. She didn't want sweat... She didn't want to mess up her nails. She didn't want to mess up her pretty outfits that she wore ... She would be like, 'Oh my God, you got dirt on your hands. Don't touch me'.... She told me she never took her kids outside until I started working. For 20 years these kids didn't go outside.</p> <p>¶B16: This past week a teacher didn't want to come out 'cause there were bugs on the playground! 'I don't like the bugs and gnats'. You mean you're gonna keep these kids in here from 8:00 to 5:00 because there's a little bug on the playground?!</p>

Table III. *Continued*

Barrier	Example Quote
Too much chaos/noise	<p><b>Too much chaos</b></p> <p>¶B17: I don't like playing games outside. It's totally my least favorite time of the day because I feel like it's so chaotic. They're running, and they're screaming and they're yelling, and ... I don't have so much control over what they're doing and it, you know, and ... trying to make sure that everybody stays safe is stressful.</p> <p>¶B18: Its like a big park and so its just like everyone is running different ways ... you have 20 kids out there so usually they're all spread out, like when we go outside . . . I don't feel like I can really honestly give my undivided attention ... when I'm watching that many. But I just think, when I'm sitting down say we're coloring together, I can talk to somebody better and still watch (other children) when we're indoors. But outdoors, I feel too distracted, watching like head counting and stuff.</p>
Too much work involved	<p><b>Helping children put on coats, hats, mittens to go outside. Then removing them all.</b></p> <p>¶B19: (re: putting on children's coats) You take all the time, get ready, when you go out and you're coming right back in. It's just a lot of work, as far as I'm concerned, for nothing! You know, It's a waste of time.</p> <p><b>Putting on sunscreen</b></p> <p>¶B20: I would say we have to spend quite a lot of time doing sunscreen. We have a new rule now that we have to put gloves on to put sunscreen on, I guess 'cause some kids are allergic to different sunscreens. I think it's ridiculous but anyway, I understand the logic, it's just hard, you know.</p> <p><b>Setting up portable play equipment (e.g. taking out bicycles from storage, bringing out art easels)</b></p> <p>¶B21: We have to keep some of our equipment locked up inside the building at night. One teacher doesn't like to have to put it away at night so she won't get it out. Then I come out after she has been out there and then the toys aren't there for me. Then it's a matter of leaving the children, going into the school, going in the office, getting the key and you can't do that all the time.</p> <p>¶B22: Her reason for not going out was she was kind of heavy and she would say, 'I just can't carry that stuff up and down the steps. I just, it's too hard for me to be trying to carry bikes up and down the steps'.</p>
Teacher is sick allergies	<p>¶B23: When the humidity is real bad, I have sinuses and allergies so I can't take it myself, you know, so, and once it gets too hot, we don't take the kids out.</p> <p>¶B24: It's too hot for me. I got asthma.</p> <p>¶B25: Soon as somebody cut their grass, my allergies just start and I have to go in.</p>

**Table III.** *Continued*

Barrier	Example Quote
Teacher overweight or 'lazy'	<p>¶B26: A lot of times I think, you know, the adults are not necessarily active as well, and with teachers especially. Because you're devoting so much of your time to caring for the children and to planning for them... And I think you're taking care of everyone else and you're not taking care of yourself. So we get overweight as someone who is not taking care of ourselves. And then we get a little bit lazy and don't want to give the children the activities they need because we're lazy and not active ourselves. So I am wondering if maybe getting the teachers more active would have an effect on that.</p> <p>¶B27: Well what came to my mind was teachers being lazy ... I have had teachers take chairs out (side). (I thought) 'What? A chair? Why are you doing that?' I wouldn't say it to them but I had a problem with it! And they would sit there and (yell at the children) 'Stop!' 'Don't do that! Quit running so hard ...' From their chair! ... Just simply being lazy and don't want to interact. One was real heavy and I believe that was her problem. Not the children. Don't take it out on them.</p> <p>¶B28: We have a couple (of teachers) that they get outside and they sit and they sit and they never move! 'I am gonna sit here ... I'm gonna bark commands.'</p>
Teacher has low self-efficacy/self esteem	<p>¶B29: One teacher ...actually two of them I'm thinking of, sort of have their own inhibitions about their own physical selves. And so they didn't always encourage the children to be running. They wanted them to kind of slow down. And I think because they didn't feel good about themselves running. You know, they're self conscious about—And when you are teaching this age child, you have to be a child yourself and some adults find that difficult. They're too self conscious about letting their hair down or having fun.</p> <p>¶B30: I think it also could be that person had a bad experience on the playground and it carried on to their adult life. They had a bad experience and they carry it on to their adult life and the kids are getting punished.</p>

**Table IV.** *Teachers' perceptions of their roles in guiding children's outdoor play*

	Example Quote
Balancing benefits and barriers and decisions whether to go outdoors	<p>C1: You know, It's all the teacher's decision of how much time they're gonna get and how much they're gonna do. What things they are gonna do with them. Some teachers just aren't into that and some teachers are into that. So it depends.</p> <p>C2: I can go out but it's really up to the (individual) teacher whether or not they want to go out. If it's (the rain is) really light, I think I'd keep my kids outside if it's warm enough. If it's cold, I'm not gonna take them out.</p> <p>C3: They are supposed to go out everyday. But whether they do or not, It is not always regulated at our center.</p>
Teacher as gatekeeper-deciding whether or not to go outside	<p>C4: Because some of them (teachers) have a headache, or you didn't have a good day, or you think it's too hot for you or you think it's too cold, or you just don't feel like going outside—And because you can have that pull at that time to say whether or not you are going to go, then you take advantage of the situation and then you don't go, not keeping the children in mind.</p> <p>C5: I have one teacher in our center. I have to ask her, 'Are you gonna take your kids out?' ... She will call (our classroom) and say, 'I'm not coming outside'. I'm like, 'Why isn't she coming outside?' But she never wants to come outside. I have never seen her take her kids on walks. We go on walks everyday and we play outside everyday. I don't understand that.</p> <p>C6: In this instance it was because the director had left the center for a meeting. It was (supposed to be) outside time after lunch time. Lunch was starting out, cots were out, bathroom is done, so they were on their cot 30–45 min earlier 'cause outside (time) was skipped. That was for the teacher to be able to sit down and relax for herself during their whole nap time. They didn't use the muscle room. They didn't do anything. Long nap.</p> <p>C7: When I got sent to be with her (an older, more experienced teacher) one time, just to fill in for a minute, and I am like, 'Oh man, she don't like to go outside!!' It's just a small little room that she's in and it's just like, 'I know these kids want to go outside. I want to go outside! Their parents want (them) to go outside!' But I don't, I don't say anything 'cause I know she doesn't. She'll say, 'Well, I don't want to have to write the incident report'.</p> <p>C8: I started there in like December and we didn't go outside, like outside to a playground anywhere, I don't know, it was a while! We had a nice day maybe in February some time. But when it was real cold, there is no where to go to. Like 'cause you don't want to go to the playground with the snow. There wasn't a point.</p> <p>C9: The kids never went out. The teacher that was under her she told me she said, (whispering, as if a secret) 'She never goes out' ... . As it got closer to the end of the year again and closer to May again and started getting warmer, I didn't want to stay inside. I wanted to get out! And she never wanted to!</p>
Teacher as gatekeeper-restricting access to equipment and parts of playground	<p>C10: Some teachers don't care if you dig in the mud. Some do. Especially at this other center I worked at. I said, 'OK, you guys can dig' and then the assistant director would come out, 'Don't dig in the mud'. Then the director would come out, 'they can dig in the mud'. It's all the adult'.</p> <p>C11: She's very nervous about playground and she plays, you know, police patrol, playground patrol. You know, 'Don't do this, don't do that. Don't do this'. So kind of making restrictions for the kids ... Yeah, restricting their natural instincts'.</p>

**Table IV.** *Continued*

	<p>C12: I remember one teacher I worked with about 2 years ago and she didn't like the kids to be on the swings very much. Why did she feel that way? She felt that it was a safety hazard. I don't know if she had a bad experience with a child or what ... I felt that they are never gonna swing if we wait until they get to college!</p>
<p>Spectrum of teacher roles on playground</p>	<p>¶C13: Well I've experienced, I've experienced teachers who didn't want to go out and I've experienced those that were very eager. So I've been on both sides of the fence.          Moderator: How does it work when you have to work with a teacher that doesn't like to go outside? How does that impact you?          They go (outside) but sometimes it's not so pleasant (few chuckles). They really stand on the fence because they don't want to really be out there</p>
<p>Teacher as facilitator</p>	<p>¶C14: If I see a child alone, I'll encourage some of the older children to play with them so that's he not just sitting and not using all of his gross muscles ... Some children don't always want to participate when we're doing songs or dancing. And I'll ask them to try it. Some of my 3 year olds are kind of reluctant to do the tumbling mats but then they try it when they see the older children. I'll say, 'Would you like to help?' I'll just hold their hand and then they feel secure enough and confident enough that they can proceed.          C15: I like to play with them. I get out and throw a ball, I run, I jump rope. I do whatever they do ... That's my biggest thing is to interact with them so they can see an adult can have fun as well.          C16: I just kind of walk around and depending on the child and what their energy level is, I'll try to get them ... if they have a lot of energy, maybe throwing a ball or whatever. I also encourage a lot of nature 'cause we have a lot of acorns all over. We actually don't have a playground. We just have a parking lot ... Also dramatic play, I try to encourage that. We pretend I was a gas station attendant. We try to do dramatic play outside. Also get them to run around and play sports.</p>
<p>Teacher as chaperones</p>	<p>¶C17: The outside time, I like it to be not teacher-directed... We have some little alcoves in the playground equipment where there are little benches and they (children) go and sit in there and they're just chat with each other. I'd love to be a little ant and listen to what's going on. So I would like it to just be open and not so directed and just sit back and kind of observe.          C18: I typically don't play with them much when they're outside just for supervision reasons. It's hard to notice everything that's going on if you're engaged a lot with a group of children.          C19: You don't want to have too much teacher direction on the playground ... the playground is really their time. Yes, provide them with things to get them started but I don't like to take a very active role on the playground. I let them lead me, if I get involved. It's their time.          C20: I think that outside time is their time. If they're not doing anything, yes I am gonna try to help them find something, but I haven't run into that problem! When they're outside, they find something to do. I think that's their 45 min, hour for them to choose what they want to do and run and play. I'm gonna pretty much guide you all day long but when you're outside, you deserve to pick your own things to do now.</p>
<p>Teacher as gatekeeper-teachers distracted or disengaged</p>	<p>¶C21: This teacher, she just was like really old, I think it was the end of her career and she was just one of the teachers that just sat. You know, whatever the activity, she would just move her chair from here to here to here ... and just sat. She</p>

Table IV. *Continued*

didn't really interact with the kids, never went out ... and the kids were really suffering 'cause they were really disruptive ... and their focus... they didn't have any focus... So they came to my class ...the next year, she would say, 'This is a problem child, this is a problem child, this is a problem child'. And all the problem was they just needed to go outside and run and play and stuff.

C22: I think for the most part a lot of teachers, that's their free time (outside time)... They basically just stand back and if they see them doing something, they'll yell it across the area. Or very rarely will they go up ... and put somebody in time-out... I don't think a lot of teachers interact with kids when they're outside. They mostly just observe them for safety purposes.

C23: I have a coworker that I'll be standing there at the tree house you know, helping them go up and down, and she will sit behind me on the bench and sit there and talk. So when the kids are done with the tree house, I'll move to another toy and work with them on that and she'll follow me and sit behind me there and talk.

C24: A: And they just choose to sit in the yard, watch, talk on their cell phones ... and let the kids watch themselves (lots of talking) and eat mulch and whatever else is on the ground ... If it's a person (staff member) you haven't seen all day long and your outside time is the same time, you're gonna text that person or you are gonna get to the gate where they are and start talking. The children just do what they want to do.

keeping children indoors for an entire winter season (¶B8 Table III, ¶C8 below) or school year (¶C9) due to personal preferences and concerns about the weather.

### **Restricting access to equipment and parts of playground**

Teachers could also act as gatekeepers by blocking off specific parts of the playground, for safety or personal reasons (¶C10, ¶C11, ¶C12). Participants suggested that these restrictions teachers place on children's activities may have been motivated out of fear (¶C11) or a previous bad experience (¶C12).

### **Spectrum of teacher roles on playground**

Participants described a spectrum of roles (¶C13) that teachers could play on the playground, ranging from actively participating in play with children (teacher as facilitator), to supervisory only (chaperone), to being distracted or disengaged.

#### *Teacher as facilitator*

The following quotes exemplify teachers who see their role on the playground as a facilitator (¶C14, ¶C15, ¶C16) to children's activity. Participants discussed their role in promoting children's gross motor skill development and encouraging all children to engage in physical activities (¶C14).

#### *Teachers as chaperones*

Many participants felt their primary responsibility on the playground was to keep children safe and saw their primary role as a chaperone (¶C17, ¶C18). Several cautioned against too many teacher-led activities (¶C19, ¶C20).

#### *Teachers distracted or disengaged*

Lastly, participants suggested that sometimes teachers may inhibit children's physical activity by not engaging with the children while on the playground (¶C21, ¶C22), as many had worked with colleagues who disengaged when going on the playground—either to socialize with other teachers or take a break (¶C22, ¶C23, ¶C24) or because they didn't



see facilitation of active play as part of their responsibility. A few participants stated that they had seen colleagues talk or text on their cell phones (¶C24) while they were supposed to be supervising the children outside.

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## Discussion

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Participants noted numerous benefits to children's physical activity in general and outdoor time in particular that have been cited in the health and education literature, including obesity prevention, gross motor skill development and self-efficacy, stress relief, improved mood and attention. While others have reported that child-care providers recognize these benefits [59], among our participants there was a pointed awareness of the integrated physical and psychosocial benefits of physical activity, particularly for this age group and particularly when done outside. Participants pointed out an unintentional social benefit of limited access to portable play equipment—that it fostered individual children's negotiation and problem-solving skills. In addition, both short-term (e.g. better napping and attention later in the day) and long-term (e.g. obesity prevention) benefits were noted. Of note, many of the short-term benefits were not only for the children but were beneficial to the care staff (e.g. easier nap time, behavior management). However, participants also noted numerous barriers to going outside, many of which were related to their personal preferences or beliefs. Some barriers (e.g. weather and teachers' personal health or circumstances) have been identified in other focus group work with child-care providers [60]. Other barriers, such as not being a cold weather person, not enjoying the noise and chaos outdoors or the amount of work involved in preparing children to go outdoors, appear to be novel.

Participants recounted that for many teachers the barriers outweighed the benefits, and because the decision of whether or not to take the children outside ultimately resided with the teacher, teachers perceived that they were the primary gatekeepers to the playground. Their perceived role as gatekeeper was cast in three ways: (i) deciding whether or not to go to the playground, (ii) deciding what equipment

and parts of the playground would be accessible or off-limits and (iii) deciding what level of engagement to have with the children. Many participants had encountered colleagues who disengaged on the playground by sitting, standing by the fence or socializing. There was less consensus about what a teachers' role on the playground should be (activity facilitator versus safety chaperone) and to what extent should children's outdoor time be structured versus unstructured. These findings suggest that children could have very different gross motor experiences even within the same facility (with presumably the same environment and policies), based on the beliefs, attitudes, creativity and level of engagement of their teacher. Our findings that teachers perceive themselves to be gatekeepers to the playground appear to be novel but are consistent with the Health Belief Model and the Theory of Reasoned Action and Theory of Planned Behavior [61] in that teachers' attitudes and beliefs influence their behaviors, and that more experienced teachers' actions may establish the normative behavior for newer teachers. In this case, however, teachers' attitudes and beliefs are also influencing the behaviors of the children they care for, as these preschool-aged children are entirely dependent on their caregivers for opportunities to be active.

Our findings about the importance of teachers' attitudes, level of engagement with the children and modeling behaviors are consistent with other quantitative studies that have examined their association with children's objectively measured physical activity [6, 42, 54, 55, 62]. Dowda *et al.* [46] and Bower *et al.* [49] both found that higher levels of teacher training were associated with higher center-levels of physical activity. Brown *et al.* [6, 55] have reported that teachers rarely encouraged children's physical activity or used structured games. Yet when instructed on how to incorporate brief structured activities during outdoor play [62] or throughout the day [54], teachers can have a tremendous impact on increasing children's activity levels. Fees *et al.* [60] found that family child-care home providers felt they lacked training in planning and implementing structured activities to enhance children's specific motor skills. Our findings suggest a potential mechanism for why focused teacher

training may be an effective strategy for increasing children's physical activity in childcare.

The importance of the role of teacher as gatekeeper to the playground may be profound. Even if the center's schedule calls for two daily outdoor active opportunities [45], participants described instances in which the teacher could override the schedule. Assistant or junior teachers did not feel comfortable challenging lead or experienced teachers' decisions. Thus children who have a teacher who is not a 'cold weather,' 'hot weather' or 'outdoor person' may rarely have opportunities to go outside. While on the playground, teachers recognized that they served in various roles that could influence the amount of physical activity in which children engaged. The importance of the level and type of engagement of the teacher on the playground (e.g. chaperone versus facilitator) and the extent to which they do not restrict elements of the playground may partly explain recent conflicting findings [46–49] about whether or not providing increased outdoor time can increase children's physical activity in childcare. Specifically, if children are under the care of a disengaged or overly restrictive teacher, increasing children's outdoor time will not necessarily increase their physical activity.

### Limitations

Our study relied on self-report and proxy-report, we did not observe teachers' actual behaviors. The extent to which individual teachers' beliefs and attitudes influence their behaviors or children's active opportunities cannot be determined from a qualitative study. Our purpose was to generate hypotheses about why children's activity level varied across different centers. Although we tried to recruit participants with a range of experiences participation was voluntary and there may have been a selection bias; i.e. those who chose to participate seemed to view children's active opportunities generally favorably. We asked participants to reflect both on their own behaviors as well as the behaviors of their present or past colleagues and found generally positive reflections of their own behaviors on the playground as facilitators, while stories about teachers as inhibitors of activity were mostly proxy

descriptions of co-workers. Almost all of the participants were female, and either Caucasian/white or African-American/black, which is reflective of the child-care work force [63] and the predominant ethnic/racial groups in Hamilton County. Future studies are needed to better understand teacher-related barriers to children's physical activity that may vary by region, state or cultural group.

A strength of undertaking this study in Cincinnati is that the city is located in a temperate zone with distinct seasons. Previous studies in more moderate climates such as in coastal California [48] may not have had the variability in weather to study the potential effect of weather or teacher's attitudes toward weather.

### Implications

There are important implications to our findings. Because of the crucial role of the teacher in children's active opportunities, a center could have an exemplary playground with gracious amounts of space and equipment but still have very low levels of physical activity if the teachers rarely bring children outside for active play. Alternatively, a center could have no playground on-site and/or minimal equipment but with highly creative and activity-oriented teachers, the center could still achieve very high levels of physical activity for children through improvised races, games and activities in an empty parking lot or during nature walks.

A central conclusion or policy recommendation that emerges from this research is that in order to increase children's physical activity in child-care centers, interventions must target and support the key decision-makers—the gatekeepers to the playground—teachers. Interventions could involve teacher training on age-appropriate structured games, and focus on improving teachers' self-confidence and efficacy on the playground. Interventions may also need to address common teacher-perceived barriers to going outdoors, including beliefs and preferences about weather and the amount of work involved in taking children outdoors. Such interventions are crucial with parents working long hours and/or children living in unsafe neighborhoods, as their time in childcare may be their only opportunity to be active.

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## Conflict of interest statement

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None declared.

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