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Assessing Barriers and Enhancers to Increasing Physical Activity during the School Day in Children on an American Indian Reservation: A Qualitative Research Study

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Abstract

Objective: We attempted to determine factors that enhance or limit physical activity (PA) in children living on an American Indian (AI) reservation.

Methods: Six audio-recorded focus groups (FGs) were conducted. Each group included 6 – 8 participants (N = 42) with 3 grade specific FGs (4th – 6th grade students) and 3 adult FGs.

Results: FG analysis identified 4 main barriers to PA: school environment; community and school resources; electronic devices; and the role of parents and family. Analysis revealed 3 main strategies to increase PA: structured/non-competitive activities; structured/competitive activities; and increasing school and community-wide capacity.

Conclusion: The results from this study provide a school health perspective on the 4-day school week.

Keywords

American Indian Health; School-day physical activity

Obesity has escalated to epidemic proportions in the United States (US) affecting one-third of all adults and nearly one-fifth of children.¹ This burden is of special concern for American Indian (AI) children as studies have reported obesity prevalence ranging from 12% to 51%.^{2,3} Obesity is the greatest risk factor for developing type 2 diabetes mellitus (T2DM).^{4,5} The average annual prevalence of T2DM in AI youth (<20 years old) living on Montana and Wyoming Indian reservations is 1.3 per 1000.⁶ Research shows that increasing physical activity (PA) may reduce the risk for childhood obesity.^{7–21} The alarming rates of

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Human Subjects Approval Statement

Approval for this study was obtained from the Rocky Mountain Tribal IRB, Montana Wyoming Tribal Leaders Council, Billings, MT.

Conflict of Interest Declaration

All authors of this article declare they have no conflicts of interest.

AI childhood obesity accentuate the urgency to develop sustainable and effective behavioral interventions that increase PA in tribal communities.

Few studies have conducted formative assessments to design obesity or diabetes prevention interventions for AI children.^{22–25} The available studies follow a similar approach as the current study in terms of partnering with the community and conducting a series of focus groups (FGs; and/or interviews) to generate ideas and strategies around a specific health concern, and then develop an intervention based on the community-identified strategies.^{8,16,26,27} This kind of community-based participatory research (CBPR) approach fosters a collaborative partnership between the researcher and tribal community and actively engages the community in all aspects of the research process,²⁸ builds upon existing community strengths,²⁹ and holds significant promise for implementing effective and sustainable public health approaches.³⁰

Formative research done with AI communities have found strategies to increase PA such as basketball, football,^{22,25,31} and integrating AI culture and tradition²² in the program. These studies also cite television viewing,^{23,25} homework,^{25,31} and lack of time^{25,31} as barriers to PA. Only one of the previous studies was done in Montana. It is unclear if divergent strategies might be recommended on a reservation in northwestern Montana, which differs in geography, climate, history, culture, and traditional practices compared to those within and outside of Montana.

The purpose of this study was to identify community members' (children and adult) perspectives on ways to increase school day PA in elementary school children. The main themes and strategies identified from the community FGs were used to implement age-appropriate and culturally relevant activities during school for children in the 4th, 5th, and 6th grades.

METHODS

Setting

The community is small, rural, and provides limited opportunity for full-time employment. The population of the community has less than 1000 persons³² and is one of many small towns located on the reservation. Among those living on the reservation, almost one-fourth of the children live in poverty or in single-parent families and a little over one-third live in families where no parent has full-time, year-round employment.³³ The school is state operated, but employs tribal members in various positions. Almost two-thirds of K-12th grade students on the reservation qualify for the free- and reduced-cost lunch program.³⁴ The community is almost half AI and half white (this demographic is reflected throughout the reservation), whereas the school is approximately three-fourths AI and one-fourth white. Most individuals that self-identify as white are descendants of the tribe and are at equally high risk of obesity as enrolled members.

Community-based Participatory Research Approach

In the fall of 2011, we began the CBPR process by developing relationships and obtaining approvals with the Tribal Health Director, the Tribal Health Diabetes Team, Tribal Council,

the Indian Education Committee, the school superintendent, principal, teachers, and community members.

Once relationships were established and the necessary approvals were obtained, the first author (VG) collaborated with the Tribal Health Diabetes Coordinator to hold a community meeting. Tribal Health staff recruited participants to the community meeting with flyers posted at local health clinics and elementary schools and by word of mouth at reservation and community events. These recruitment strategies implemented by local tribal community members helped engage a heterogeneous sample from the community with respect to age, tribal affiliation, and position in the community (educator, parent, elder, and elementary school child).

The purpose of the meeting was to discuss the goals and objectives of the study and enlist community members' support and involvement. Approximately 20 families attended the community meeting and received information about the study, the purpose and intention of the FGs, and how the data would be analyzed, secured, and disseminated. At the conclusion of the meeting, the investigators collected contact information from adults/parents who were interested in participating in the FGs and parental consent from parents who gave their children permission to participate.

Participants

Six FGs were conducted that ranged in size from 6–8 participants. Because we were particularly interested in the views of children, 3 grade-specific FGs consisted of 4th–6th grade students (N = 22) who attended the local elementary school. Three adult FGs consisted of teachers, school staff, parents, elders, and community members (N = 20).

Procedure and Data Collection

FG sessions were led by trained AI graduate students from the University of Montana in May and June 2012. A moderator's guide that included open-ended questions was developed by the researchers and the Tribal Health Diabetes Coordinator. The questions progressed from general to specific and contained questions pertaining to barriers and strategies for increasing PA during the school day (Table 1). The focus groups began with a meal and an overview of the study. Adults completed a consent form and all participants completed a brief demographic survey. All sessions were audio-taped and lasted 45 to 90 minutes. The adult participants received a \$20 cash incentive and the child participants received a basketball.

Data Analysis

Audio-recordings were transcribed, which formed the basis for analysis. Analysis followed the criteria for qualitative rigor that applied the concepts of credibility, transferability, dependability, and confirmability.³⁵ Themes and sub-themes were generated that consisted of strategies and barriers to PA. The investigators constructed a list of coded themes based on the inductive methods of grounded theory,³⁶ and categorized the data using line-by-line analysis.

Once the final coding scheme was prepared, a blind study team member tested all possible codes on a subset of the entire sample that consisted of 69 text units and constituted 10% of all six verbatim transcripts.³⁷ The coding scheme was successful with 59 out of 68 text units and resulted in a score of 0.840 with Cohen's kappa³⁸ significantly higher than chance (kappa = .820). Disagreements in the coding scheme were resolved by detailed discussions of the 9 discrepancies and considering how indistinguishable units could be described more effectively. The coding scheme was then used for the remainder of the study and integrated into a qualitative analysis software program (NVivo 9, QSR International, Cambridge MA). The authors corrected minor grammatical inaccuracies in the quotes presented in the text below.

RESULTS

Description of the Sample

The child FGs consisted of 14 boys (64%) and 8 girls (36%) with a mean age of 10.6 ± 1.0 years. Nineteen (86%) children identified as being AI and 3 as being white (14%). The adult FGs consisted of 5 men (25%) and 15 women (75%) with a mean age of 40.4 ± 8.5 years. Nineteen (95%) participants identified as being AI and one (5%) identified as being white.

Thematic Overview

Analysis of the FGs identified themes and sub-themes for barriers to PA during the school day resulted in 4 four main categories: *school environment*; *community and school resources*; *electronic devices*; and *the role of parents and family*. Emergent themes and sub-themes for strategies to increase PA fell into 3 main categories: *structured/non-competitive activities*; *structured/competitive activities* and *increasing school and community-wide capacity*. These results are discussed below.

Barriers to Physical Activity

School environment.—The elementary school teachers use a lecture style approach where the teacher stands in front of the class and the students sit in desks. A large portion of the adult FGs were spent talking about the relationship between the teaching style of teachers and their child's PA. A parent stated:

One of the things that you have to think about is that all of these classes are lecture methods. [Students] just sit and [listen] the whole time.

Exacerbating the amount of instruction time is the 4-day school week that runs from Monday through Thursday – a policy that was implemented to decrease facility operation costs. One of the consequences of the 4-day school week is the number of recess periods decreased from 3 to 2 per day and the length of the school day is increased. This has resulted in a more intense focus on academics to compensate for one less day of instruction. An adult stated:

By policy, they have to have a certain number of minutes of instruction time and that is squished into 4 days.

One parent talked about the difficulty with the long school days and how this policy hindered children from participating in after school extra-curricular activities:

... getting out at 4:00 pm, between homework and dinner and showers, it's hard to get all that [extra-curricular activities and sports participation] in.

Adults complained how the school enforced lofty academic requirements in terms of the volume of homework and performance on tests. A parent talked about how difficult it is for the children to meet the academic expectations and the consequences for falling short – she stated:

The one thing that I don't like, too, is when kids don't get homework or anything done – they keep them in at recess. And this is the age where kids need to be active.

The collective voice from FG participants agreed that this schedule contributed to sedentary activity for the majority of children.

The playground is closely monitored, which may hinder, rather than promote PA during recess. Adult FG participants mentioned how the playground lacked structured play and the rules prevented children from playing certain games (eg, tag) that would enhance activity during recess. An adult stated:

I don't think they get enough [physical activity] – [the] school doesn't have enough equipment for recess time and for outdoor activities like balls. My youngest one comes home and he says – 'We can't do this at recess because the teacher says we can't.' They are simple games like tag.

In addition, the short duration of recess makes it difficult to organize games and activities on the playground and was described as a sedentary break for many of the children.

A school environment sub-theme was identified as an emphasis on competition and fitness and how that discouraged school day PA. Children talked about the difficulty with conditioning and body weight measurements during the presidential fitness test in physical education (PE). One child said:

I don't like the mile [time trial run] and I don't really like.... Pull-ups and the curls because I can't always do very many of them.

The test itself was identified as a barrier to PA as the children expressed disinterest and discouragement with the mile run, sit-ups, push-ups, pull-ups, curls, and sit and reach.

Community and school resources.—Participants identified a lack of equipment on the playground and during PE classes, making it difficult for the children to engage in games and activities. Participants described how the playground resembled a field and many students were sedentary during the recess break. A parent said:

Yeah, it's bad. If you look over there it is pretty much just a field ... more than half the kids just sit during recess time.

Coupled with having nothing to do, students have been faced with inappropriate playground conditions. One teacher commented:

There's teachers that have to go in before school and pick up all the bottles and cigarette butts or whatever that's on that playground.

The budget does not pay for a security position to patrol after hours. There is also no funding to hire coaches, making it difficult for the community to find volunteer coaches for sports teams. Another teacher said:

There's not enough coaches so they [children] were turned away [from participating in sports].

Electronic devices.—Children identified electronic devices such as video games, computers, television, and iPods as barriers to exercise. Some children were aware that these devices hindered active time, but still enjoyed using them. One child commented:

Playing video games – it's good and bad because it doesn't let you get as much exercise, and it's good because it's really fun.

Another child said:

Once you start playing games you just can't quit.

Adults identified cell phones as a barrier to their child's exercise. One parent talked about the amount of texting their child does in comparison to the activity they receive during the school day:

Most of the time [in PE] they don't break a sweat or they are looking bored. I see people getting thumb exercises [texting on their cell phone] more than anything.

Role of parents and family.—Adults recognized the influence that home life has on the development and choices children make when they are at home (outside of the school day). Some adults talked about how persuasive the parent's influence was on making positive changes. A parent said:

I think a major factor is their home life – you're competing with home life and home life sets a standard on the way things happen. If it's not encouraged at home, there's no way a stranger is going to be able to do it if their folks can't keep them active.

Consequently, parents were identified as being unhealthy role models for their children. Much of this was attributed to their diet and unhealthy habits. A parent said:

I did want to mention that another big component of the problem with diabetes is diet. I think that a lot of bad habits are being perpetuated with children.

Strategies for Increasing Physical Activity

Structured/non-competitive activities.—Expanding playground space and painting lines on the playground concrete were perceived solutions to counter the lack of equipment during recess. An adult said:

Expand their space to use it for kickball and softball.

In terms of painting lines on the playground, a teacher said:

I have to paint the lines on the 4-square....we need lines painted which is a matter of time and [the cost of] a case of paint.

In addition, children and adults alike wanted the frequency of recess breaks increased throughout the week.

The word “structure” often emerged when talking with the adults. One parent commented:

If they have something that was a little structured [during recess] where everybody had to do it, so you could get everybody involved.

A teacher stated:

Maybe have somebody out there specifically to set up different games [during recess].

Children identified several games that were non-competitive – some required equipment and others required painted lines. These were identified as jump rope, hopscotch, tag, 4-square, 9-square, swinging, and playing on the monkey bars.

Structured/competitive activities.—Children identified several competitive team sports they would play if they were offered during recess. One child commented:

Most of us really like dodgeball because we run a lot [and]you exercise with all of your body.

The PE teacher said:

Everybody gives me such a hard time about dodgeball, but they beg for that silly game.

Children identified several other competitive team sports they would participate in such as basketball, softball, football, varying kinds of soccer and volleyball, ultimate Frisbee, baseball, t-ball, lacrosse, rugby, kickball, and Native American kickball.

Increasing school and community-wide capacity.—Adults identified the need for building capacity and tapping in to existing resources. Participants agreed this would require collaboration among the administration, teachers, and parents. One parent said:

If you have a good administrator that says that we are going to do this....then it happens.

One of the duties that inhibit teacher engagement in activities that increase PA is preparation time. Recess was one of few breaks teachers have all day and it is vigorously protected. A parent said:

Teachers want the holy prep time. They don't want that to be interrupted.

According to adult FG participants, parental involvement was essential to the sustainability and success of a child PA program. An adult said:

I would just say like you doing this [the FG and proposed study], it picks up the slack for the kids that have parents that have no interaction with their kids at all.... they wouldn't get it at home no matter what.

Healthy role modeling among parents and teachers was seen as a powerful resource within the community. One elder said:

I had some health issues but I got them taken care of. I am going to try to get her [granddaughter] to start walking with me because before I couldn't walk, but now I can, so I am going to get both of my granddaughters to walk with me. I think they do need some exercise.

Several participants described how sedentary behavior and unhealthy food choices by both teachers and parents directly affected the children's behaviors. A parent said:

I think leading by example is big.

DISCUSSION

We explored strategies and barriers to PA during the school day in 4th, 5th, and 6th grade children attending an elementary school on an AI reservation. Non-competitive playground activities and competitive team sports were strategies to increase PA. Another strategy included painting lines on the playground for games such as hop-scotch and 4-square. For sustainable and effective changes to occur, adults agreed this endeavor would take a coordinated effort among school administrators, teachers, and parents. The 4-day school week is filled with lecture style teaching and lofty academic requirements – together these were viewed as substantial barriers to PA. Lack of resources such as personnel and playground equipment has contributed to sedentary activity.

Participants discussed how the 4-day school week negatively impacts PA, which is a novel finding of this study. Prior research on the 4-day school week is primarily descriptive – studies have focused on the reasons that schools transition to a 4-day school week, how this transition impacts student academic performance, issues with having one “off day,” and the lengthy school days equate to more instruction time.^{39–41} To our knowledge, research on how the 4-day school week impacts child PA does not exist. Participants in our study discussed how the 4-day school week lengthened each school day, decreased the duration and frequency of recess, intensified academic requirements (homework and tests), and prevented many children from participating in after school activities. Coupled with the lengthened school day, the legacy of No Child Left Behind (NCLB) also may contribute to the augmented instruction time and decrease in school day PA. According to the Center for Education Policy,⁴² recess has been cut an average of 50 minutes (20%) per week since 2002 (the year NCLB was enacted). In contrast, instructional time in English Language Arts and Math has increased by 141 minutes (58%) and 89 minutes (45%), respectively. Despite the impact of NCLB, the 4-day school week has minimized PA opportunities during the school day for children living in this reservation community.

Results from previous studies reveal that participants identified similar PA strategies as those in this study. These included supportive social networks²⁴ and developing school-based

activities.¹⁶ Participants in our study identified the importance of family relationships and social networks – these were the catalyst for effective and sustainable change to increase daily PA.

Child participants discussed how there were no activities available to them during recess. These participants expressed a desire for someone to be on the playground with them to play structured and competitive team sports during recess. A few of the activities children identified are basketball, football, and soccer. These findings are similar to those in other studies identified by AI children during FGs.^{22,25,31} The desire for adult supervision and structured games support the need for trained staff members to be on the playground during recess to lead team sports and teach fundamentals, rules, and sportsmanship. The FG participants talked about over-enforcement of playground/recess rules that resulted in eliminating games that require one to be active. Prior research found that when children are “over-supervised” on the playground, their activity level decreases.⁴³ Trained staff may help to facilitate instead of hinder PA.

The children talked about how much fun video games were and that they spent a large amount of time watching television. The adults talked about the amount of texting and time children spent on cell phones, watching television, and playing video games. Collectively, the use of electronic devices was identified as a hindrance to PA, especially at home. Hood et al²³ conducted FGs and interviews with Mohawk and Akwesasne community members and reported how the use of technology has disrupted their traditional lifestyle. Television viewing led to a lifestyle change contributing to diabetes. The Pathways study also identified television viewing as a barrier to PA.²⁵ These findings support the need to limit the use of electronic devices and provide alternative activities to get children active and moving.

Strengths and Limitations

We are confident that we reached data saturation because many of the same themes were discussed in each FG. A summary of the study findings were presented to the director of tribal health, the superintendent and principal, school staff, and community members. This created awareness and helped to initiate capacity building. There was excitement throughout the community and participants provided support throughout the study duration.

The interviewers were trained AI researchers from the university and no one had familial ties to the tribal community. This may have made it uncomfortable for some of the participants to disclose sensitive information. In contrast, this may have influenced some participants to be more highly critical of the school system. Teachers and school staff accounted for approximately half of the FG participants. Some of the questions explored areas of the school day that they instructed, which may have prevented some participants to state their explicit perspective.

Conclusions

The purpose of this study was to determine barriers and strategies to increase school day PA. Adults and children identified recess as an area of the school day in need of attention. The children identified structured non-competitive playground activities, painting lines on the playground, and structured competitive team sports as strategies to increasing PA. Barriers

included the school environment that consisted of a 4-day school week coupled with instruction centered teaching focused on academics (homework and test performance), lack of resources (personnel and equipment), and electronic devices. The data generated from this formative assessment was used to develop a PA intervention during recess.⁴⁴

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IMPLCATIONS FOR HEALTH BEHAVIOR OR POLICY

Many school districts have either made or are contemplating the transition to a 4-day school week. The paucity of literature provides a perspective that is almost exclusively fiscal. Participants in this study discuss how the 4-day school week impacts school day PA (more instruction time and homework, less recess, etc) and how this schedule has made it nearly impossible for children to participate in after school activities. The results from this study provide school administrators with a school health perspective on the 4-day school week and how this schedule may impact PA and overall health.

Specific policy recommendations that administrators should consider are to increase the number and length of recess periods each day, more supervised involvement from teachers that are on the playground during recess (set up playground games, teach rules, sportsmanship, etc), provide simple and low cost playground equipment, recruit volunteers within the community to facilitate playground activities, and pending budget constraints, provide after school activities for children who are not engaged in organized sports. Many of these policy recommendations require little to no cost and can be implemented with the resources that exist within the school and community.

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Table 1 Focus Group Questions about School Day Physical Activity in 4th, 5th, and 6th Grade Children

Adults	Children
Do you think children get enough exercise during the school day to help prevent obesity and diabetes?	What are some things that keep you from getting exercise each day?
Think about how much exercise children receive during the school day—can you describe some barriers they may face that prevent them from getting enough exercise?	What are some things that help you get exercise each day?
Do you think PE should be offered more days out of the week?	Would you like it if you had PE more days during the week?
Can you describe some specific activities that could be included during PE to get the children more physically active?	What kinds of exercises do you and your friends like to do during PE that is fun and exciting?
Do you think the school should allow for more recess breaks during the day?	What are the exercises at PE that are not very fun or exciting?
Can you describe some activities that could be offered during recess that would get the children more active and moving?	Would you like it if recess was offered more times each day? What kinds of exercises do you and your friends like to do during recess that is fun and exciting?
What are some ways we can get the children more active and moving during the school day without disrupting the current academic/testing schedule?	Can you tell me some of the things you would like to do during the school day when you're not in PE or at recess to get more exercise?