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Using interviews and peer pairs to better understand how school environments affect young children's playground physical activity levels: a qualitative study

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Abstract

School break times provide a daily opportunity for children to be active; however, research indicates this time is underutilized. Reasons for low children's playground activity levels have primarily focused on physical barriers. This research aimed to contribute to physical environmental findings affecting children's playground physical activity levels by identifying additional variables through the interview process. Thirteen public schools were included in the sample (total 2946 children). Physical activity and environmental data were collected over 3 days. Environmental variables were manually assessed at each of the 13 schools. Observational data were used to determine which three schools were the most and least active. The principal, three teachers and 20 students in Grades 4–6 from these six schools (four lower and two average socioeconomic status) were invited to participate in the interview process. Student interviews involved the paired interview technique. The main themes generated from the school interviews included the effect of non-fixed equipment (including balls), playground markings, playground aesthetics, activity preference, clothing, the amount of break time available for play, teacher playground involvement, gender, bullying, school policies, student confidence in break-time activity and fundamental movement skills. The effect of bullying on playground physical activity levels was concerning.

Introduction

Childhood overweight and obesity prevalence have increased globally in almost all countries with available data [1]. Children are increasingly exhibiting cardiovascular and cancer risk factors, which may be attributed to increasing levels of sedentary behaviour and decreasing levels of physical activity [2–4]. The Australian physical activity guidelines recommend that children are active for a minimum of 60 min each day [5]. While on any given day children have a 69% chance of meeting the Australian physical activity recommendations, time spent in sedentary behaviour and the fact that children's physical activity levels decline as they age is concerning [6, 7]. Studies indicate that many children only spend 50% of their school break time being active [8, 9]. School-based interventions could effectively contribute to children's daily physical activity [2]; however, classroom curriculum demands can limit time available for physical activity. The school break-time playground environment is an ideal alternative to focus interventions for increasing children's physical activity levels. Currently, such opportunities appear to be underutilized [10].

Barriers preventing playground physical activity are important determinants of children's physical activity behaviour [11]. Barriers that have been

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identified include poorly maintained or lack of equipment, temperature, inappropriate clothing, individual physical disabilities or psychosocial deterrents such as bullying, peer pressure, gender and social networks [11–15]. Children may show a preference for quiet areas, as large numbers of children in playground space sometimes frighten younger children [16]. Other factors that may influence children's physical activity participation include adult support and involvement, teacher confidence in teaching physical activity and activity preferences [11]. Variables which have been found to be strongly associated with youth physical activity levels include self-efficacy, perceived physical competence, outcome expectations (or perceived benefits), intentions to be active, enjoyment of physical activity, social support from family and friends and spending time in environments that facilitate physical activity [17, 18].

From 1997, the New South Wales Department of Education and Training (NSWDET) began a self-evaluation process, allowing schools autonomy to make decisions and policies relating to individual schools. Policies and policy implementation are considered to be as important as the physical environment in influencing children's playground physical activity levels [19–23]. The National Safe Schools framework addresses the physical and emotional safety and well-being of all Australian students [24]. It encourages policies that ensure students' physical, social and emotional well-being and refers to issues such as bullying, harassment and child protection [24].

While there is limited research investigating children's playground physical activity preferences and associated physical activity levels, providing opportunities for children to participate in their preferred activity may increase their likelihood of participation. In a survey of after-school activity preferences, Eyler [25] found that many children preferred ball games, chasings and jump rope.

The primary purpose of the present study was to understand how physical and psychosocial school environmental variables influence children's playground physical activity levels. A larger study, including the actual playground observation of children in 13 schools conducted by the author, identified the physical environmental variables that significantly increased children's playground physical activity [15]. These included time allocated to break periods, un-shaded areas, access to non-fixed equipment, children playing with a ball, painted ground targets and soft play surfaces. Variables that significantly decreased children's playground physical activity included teachers managing or observing children, hotter temperatures and being female. Non-environmental variables that influenced children's playground physical activity levels were also identified. Research indicates a positive relationship between social and environmental variables and children's physical activity levels [26]. Sallis *et al.* [27] found that school environmental and policy interventions have the potential to increase children's physical activity however barriers to their implementation need to be better understood. In order to gain a greater level of understanding as to how physical and psychosocial variables affect children's playground physical activity levels, a qualitative research approach including individual and paired interviews was adopted.

Interviews are regarded as an acceptable and effective method of gathering information from adults and children [28–30]. Porcellato *et al.* [31] examined the appropriateness of focus groups with young children and concluded that focus groups with young children were viable, but needed to be small, homogenous and interactive to maintain a high level of interest and participation. Paired interviews (peer pairs) meet these criteria and represent a viable alternative for collecting qualitative data from children. Paired interviews have been successfully used in children as young as 5 years of age [32]. For example, Thompson [11] used paired interviews of children to measure attitudes and perceptions about physical activity and motivations to proactively change their activity levels.

The Social Cognitive Theory (SCT) guided the qualitative component of this thesis. Its basis is the interaction between the individual and their environment. The SCT construct reciprocal determinism describes the way that the individual, their behaviour and the environment interact to influence health

behaviour. The SCT has been widely used in health promotion to assess health determinants and guide research methodology [12, 33]. The SCT has been used in similar research that investigates influences from multiple domains [18, 34, 35]. In another component of this research, the SCT generated questions for student, teacher and principal surveys (A. M. Parrish, D. Iverson, K. Russell, H. Yeatman, submitted for publication). Responses to the survey questions guided the interview questions. In this way, the interview questions were grounded within the context of SCT. Interview questions addressed children's individual self-efficacy and teachers' perception of children's confidence in performing physical activity skills (fundamental movement skills: FMS). The SCT emphasizes the importance of observational learning and its impact on the behaviour of others. Observational learning explains how teachers or older children may encourage younger children to participate in activity by being physically active themselves. Self-efficacy is the individual's confidence in performing a behaviour to bring about desired outcomes [12]. This construct can be adapted for use in the teaching situation, where there is a need for positive learning experiences to encourage positive outcomes for children involved in physical activity [12]. Outcome expectations describes beliefs in the value of behavioural choices [12]. This construct could be used to understand a situation where a child does not want to participate in school playground activity after having witnessed other children being teased or bullied. The child's outcome expectations of participation in playground activity may be different if a teacher was there to monitor playground behaviour.

Method

Interview data collection

This study used an extreme case sampling method to allow participant responses from the least and most active schools to be considered [36]. Observational data gathered from 13 primary schools, as part of the larger study [37], was used to determine the three most active schools [68–70% of their break time was spent being physically active, this result was observed in two lower socioeconomic status (SES) and one average SES school] and the three least active schools (40–50% of their break time was spent being physically active, this result was observed in two lower SES and one average SES). A convenience sample of these six schools was invited to participate in the interview component of the study. One of the least active schools (lower SES) chose not to participate in the interview process, thus the next least active school (lower SES) was then invited to participate and subsequently accepted the invitation. None of the schools was informed of the activity levels or rankings of children's playground physical activity level data.

Demonstrating rigour in qualitative research is essential. This study used a cross section of perspectives from teachers, principals and students who volunteered to participate. The results presented include extensive sequences from the original transcripts [38]. The methodological steps in data collection, the use of recordings and the systematic computer analysis were executed to maintain consistency. In addition, quantitative data gathered as part of the larger study complemented findings of the interview component (triangulation), which is further indication of rigour [39, 40].

The principal, one to three teachers and 20 students in grades 4–6 from each of the six schools were invited to participate in the interview process. Children participated only if they had written parental consent. Teachers and principals gave verbal consent. Where possible, efforts were made to distribute as evenly as possible the number of children from each year in the interviews (i.e. Years 4, 5 and 6). The children were interviewed in pairs, with an attempt to ensure that each child was interviewed with a classmate of the same age. Classroom teachers and students arranged the interview pairs based on students who had consented to be in the study. There were a possible 14 interviews at each school (10 pairs of students, three teachers and the principal).

Interview questions were generated from an analysis of questionnaires which had been distributed to consenting students, teachers and principals in term one of the 2005 school year (Summer), when the

observational data were collected (as part of the larger study) [15]. The questionnaires were developed to enhance the understanding of findings about environmental factors. Questions focused on children's activity and activity preferences, school facilities and the playground environment, the effect of bullying and school policies affecting playground physical activity. For example, in reference to bullying, principals and teachers were asked: 'Is bullying an issue at your school? If so do you think it impacts on children's physical activity? What policies are in place to address this issue?' Students were asked: 'How do other children affect the way that you play?' In relation to physical activity, principals and teachers were asked: 'In what ways do your schools policies and programs encourage children to be active at recess and lunch?' Students were asked: 'Tell me three things you like to play at recess and lunch? Are you good at these things? Is there an activity that you don't play but would like to if you were better at it?'.

Interview data were collected in the last term of the school year (late Spring). The interview questions were different for each group (i.e. students, teachers and principals) but followed similar themes. Children were asked about their playground activity preferences; how temperatures, other children and teachers affected their playground activity, how playground equipment affected their activity, and their opinion of the appearance of a 'nice' school playground. Teachers were asked: how long they had been teaching, how they interact with children during break times, how school policies and programs encourage playground activity, the effect of bullying on playground activity levels, how barriers preventing them from participating with children in the playground affect children's activity, playground aesthetics and its effect on children's activity levels, their opinion of reported playground activity levels and finally, how children's FMS affect their playground activity levels. Principals were asked: how many years they had been teaching, if there is a popular school activity which affected playground activity levels, the effect of playground markings, equipment and aesthetics on activity levels, the effect of policies and bullying on playground activity levels and the ideal amount of break time for children to be physically activity.

The interviews were semi-structured. Students and teachers were asked nine open-ended questions; principals were asked ten. Principal and teacher interviews lasted for approximately 15–20 min and student interviews approximately 10–15 min. Permission was gained from each participant to record the interview on audio cassette prior to the interview. Each child was asked if she/he was comfortable with their pair and the interview situation and was assured that they were not required to respond to each question. Participants were informed that they could withdraw from the interview at any stage. To ensure consistency, all interviews were conducted by the same researcher (A.-M. Parrish) using the same interview script for each category of interview (i.e. students, teachers and principals) [39]. All recordings were transcribed verbatim. A second researcher checked the transcriptions for accuracy. Ethics approval was granted by the University of Wollongong Human Ethics Committee and the NSWDET in November 2005.

Data analysis

Interview data were transcribed verbatim and analysis was assisted by the use of NVivo version 7 [41]. To ensure consistency, each interview was read and manually coded by the researcher [38, 42]. Separate libraries were created for students, teachers and principals. The themes were generated from participants' responses to the interview questions. Initial responses were categorized and grouped to allow for the development of themes. A small number of free nodes remained when the analysis was complete; these responses were considered individually.

Results

Six principals (three male and three female), 16 teachers (all female) and 50 students (21 male and 29 female) agreed to be interviewed. No students from the smallest school ($N = 27$) were interviewed as consent was not granted by the parents. However,

the school's only teacher and principal participated in the interviews.

By the end of the interview process, data saturation had been reached as themes and issues being raised by the participants were the same as from those participants preceding them. The range of issues generated from the responses across the entire school were grouped into like themes including playground equipment and aesthetics, length of break time, children's playground activity levels and preferences, teacher playground participation, bullying and school policies and FMS. These themes are presented below.

While all efforts were made to encourage children to respond within their comfort zones, not all students responded to all questions. In two cases, a child was involved in a paired interview twice. This only occurred when there were uneven numbers of consenting children to form a pair. In this situation, a child functioned as a support for the other child and did not respond to the interview questions. However, they were involved as a respondent in their previous interview. None of the participants refused to be interviewed or stopped the interview during progress.

The paired interview format was deemed to be a favourable way of interviewing young children. The children seemed to enjoy the discussion and most children contributed in a meaningful way. The support of a classmate seemed to make them more comfortable during the interview process.

Several key findings were generated from the interview data. Children's playground physical activity levels were influences by playground equipment and aesthetics, the length of break time, children's playground activity levels and preferences, teacher playground participation, bullying, school policy and FMS.

Playground equipment and aesthetics

There was an overwhelming response to the use of non-fixed equipment in the playground during break time to increase children's physical activity. Five principals believed that non-fixed equipment increased children's activity levels, making statements such as:

> Busy kids are happy kids (Principal)

One principal believed that free access to non-fixed equipment and unrestricted access to all playground areas increased children's playground physical activity levels. Principals also believed playground markings positively influenced children's playground activity and behaviour:

> for the lonely child you always find one kid playing hopscotch on their own (Principal) and
>
> I think the playground markings increase the level of desirable playground activity, I mean the absence of playground markings and the absence of sporting equipment they're still active but they're doing often inappropriate things. (Principal)

None of the teacher interview questions made direct reference to non-fixed equipment; however, when asked to identify school policies, which encourage activity, 11 of the 16 teachers said 'access to non-fixed equipment' (nine of these teachers were from lower SES schools). One teacher noted that non-fixed equipment assists in the prevention of playground behavioural problems:

> active kids or busy kids stay out of trouble, or they are more likely to stay out of trouble. We did the activity bins. We had all that bought, all that sports equipment and put them into bins (Teacher).

All of the children believed that non-fixed equipment makes children more active. One child stated:

> There would be no playing equipment and there would be just cement and grass, nothing to play with, so you can't really play games without it. But kids like to play with fixed equipment and normal equipment (Student).

Another child indicated that non-fixed equipment prevents playground bullying:

> It helps them to be more playful and not bullying and stuff (Student).

Thirteen teachers believed that an aesthetically pleasing playground encouraged children's playground activity. One teacher stated:

> If they are in a playground with lots of fantastic equipment and fixed equipment and sporting equipment then they're more likely to use it to have a positive attitude towards it. I think it has a really huge effect (Teacher).

Children were asked what they thought a nice school playground looked like. Children identified variables such as fixed equipment, grass, flowers, trees and no litter. However, they also mentioned psychosocial variables such as 'people who trust you', no fighting, no dangerous things, playing nicely together and access to a 'quiet place'.

Children were asked what type of clothing they preferred to wear while playing. All of the children preferred to play in some form of T-shirt and shorts; some girls preferred a skirt or shorts and T-shirt.

Length of break time

Two principals from the least active schools in the study allocated less 'time for play' during break times. One school allocated 30 min of break time for the children to eat, leaving only 40 min for play. Principals at the most active schools allocated less eating time (approximately 10 min) and 50–60 min for play. One principal believed that too much time during the lunch break caused children to fight:

> They couldn't occupy themselves gainfully and meaningfully for 45 min, the children couldn't manage; there were too many fights and disputes (Principal).

However, to ensure children still had adequate time to play, he decreased the time allocated to lunch and increased the recess break.

Children's playground activity levels and preferences

Children were asked three things they liked to play during recess and lunch. The results are presented in Table I. Of the 23 activities that children identified as their favourite break-time activities, there were only three sedentary activities (see Table I). The first seven most preferred pastimes were 'active'. Ten of the 23 preferences for children's break-time playground activity (Table 1) involved a ball.

Teacher playground participation

Most teachers believed that 'teacher presence' positively affected children's playground physical activity:

> They are heaps more active because they don't get into a huff and walk off and think they've been treated unfairly. So just being there and being out, intervening occasionally when needed keeps them active (Teacher).

However, most teachers found it difficult to participate in the playground with children and monitor

Table I. *Children's break-time activity preferences*

Activity preference	Total children (of 50)	Activity level	Relies on balls	Relies on non-fixed
Handball	22	Active	√	√
Tip/chasing	15	Active		
Soccer	14	Active	√	√
Football	13	Active	√	√
Cricket	12	Active	√	√
Running	8	Active		
Skipping	8	Active		√
Sit and talk	7	Sedentary		
Basketball	7	Active	√	√
Balls	4	Active	√	√
Hula hoops	4	Active		√
Paddlebat	3	Active	√	√
Dance	3	Active		
Netball	2	Active	√	√
Volleyball	2	Active	√	√
Walk and talk	2	Active		
Hide and seek	1	Active		
Brandings	1	Active	√	√
British bulldogs	1	Active		
Wrestling	1	Active		
Sit play/Yugio cards	1	Sedentary		
Fixed equipment	1	Active		
Pop-stars/singing	1	Sedentary		

the playground at the same time. When asked what would assist teachers to participate with the children during break times, some teachers suggested having someone else to do their duty such as a teacher's aide or parent; others believed that most teachers do not dress in a way that allows them to participate (i.e. high heeled shoes, etc.). When asked if a lack of facilities to shower and change was a barrier to participating with children during breaks, none of the teachers believed it was. Most teachers believed they wouldn't have time to use these facilities even if they were available.

Almost half of the children (21 of 50) believed playing with a teacher made them more active:

> For me, yes because like if a teacher gets involved, it's … basically makes you more activated and it wants you, like it psychs you up a bit and you want to go and play with your teacher. And like, she can teach you how good she can play (Student).

Bullying

Principals at five of the six schools believed that bullying was an issue.

> I think bullying is an issue at every school …yes it, it will always be an issue. I think that while there is a zero tolerance policy it happens behind the scenes (Principal).

The one principal who believed bullying was not an issue at their school had only been at the school for approximately 5 weeks. Four schools had anti-bullying policies and two had policies in development. When asked if bullying impacts on children's playground physical activity, four principals believed it did.

> It probably does impact on some children's physical activities we've got a couple of very physical boys who don't appreciate their own strength and their own force and that's an issue that constantly arises um probably some of the lighter kids wouldn't join in those more physical games because of physical bullying (Principal).

All except one of the teachers believed that bullying was an issue at their school and more than half the teachers believed bullying affected playground physical activity levels.

> You'll see the bigger kids or the bully kids say, it's me and these 2 (the best players) against you's. You know they pick all the best players on their team and then the other kids just get beaten and pummelled and then they just get really upset and they don't want to play any more (Teacher).

The children were asked whether other children affect how they play during break times. Six children were positively influenced by other children, but half of the children felt other children negatively affected their play. One child stated:

> They're silly and they call me names, they throw balls at me and that interferes with my game. They run in and interrupt the game (Student).

Others said younger children hindered their play by getting in their way:

> Sometimes the little kids run into the game. Usually, we have to stop playing until they go away or something (Student).

Some children described incidents of teasing, cheating, being silly, being 'smart-alecs', annoying them, children deliberately bumping them, limited space and disputes in games. Those who were positively influenced believed that other children were nice to them and encouraged them to have fun:

> It's better to play around with people because you've got a better game, whatever game it is. It's just …you have more fun (Student).

School policy

Some schools had policies that directly influenced children's activity levels. One school offered fitness

programs during class time, which they believed were mimicked in the playground. Some schools limited sedentary activities (such as computer labs) during break times. One school provided safe areas for younger children to play. Two teachers (one from the least and one from the most active school) believed that policies to encourage activity were not needed as they thought children at their school were active enough. One teacher (from the least active school) said:

> But they don't seem to need a lot of encouragement to get up and go out and run around (Teacher).

Some schools had policies that had a negative effect on children's playground activity levels. Two schools had 'No Hat, No Play' policies, where children have to sit in the shade for the break time if they do not bring their hat. Another school had 'no running on concrete' and 'no ball games under covered areas' policies. Some schools limited playtime during break periods.

Fundamental movement skills

The teachers were asked if children have sufficient FMS and if they thought this affected children's playground activity. Seven teachers stated that FMS are taught to younger children (4–9 years of age) at their school and that it made a difference to the way children participated in physical activity, as the children were more confident. Four teachers from schools where FMS were not a focus (three lower SES) noticed that children often lacked basic skills such as throwing, catching, skipping, hopping and this affected their playground physical activity.

Several teachers observed that overweight or obese children were less likely to participate in active games. One teacher linked a lack of FMS to an increased chance of being bullied:

> Teachers believed the key was to introduce these skills as early as possible, by the time a child is in year six they are embarrassed about their lack of skills and less likely to participate. Definitely comes back to what I was saying before about the bullying and um children that are not active at recess and lunch because they don't have those fundamental movement skills and if you don't have them then they don't want to get involved because they're not skilled in those areas so they don't want to be ridiculed in one sense and they don't want to put themselves in a situation where they feel uncomfortable (Teacher).

In general, most students were confident in their ability with the games they chose to play at recess and lunch. However, just over half (28 of 50) said that there were games that they do not play during breaks but would if they were better at them.

> I'd like to play better at running games. I'm really slow at running (Teacher).

To establish whether children were influenced by what their friends played, students were asked if their friends play the same games as they did at recess and lunch. Approximately half of the children (27 of 50) said that they played the same games as their friends. However, 18 children identified an activity that they would like to play during break times if their friends liked the same game.

> sometimes I like playing hand ball but they don't, so I just play with them (Student).

Discussion

To date, studies have not used qualitative data collection techniques when identifying children's school playground physical activity determinants. Several key findings from the interview component of this study highlight the importance of this methodology and its contribution to the current literature. The issue of playground bullying and its effect on playground physical activity levels were a major determinant identified by students, teachers and principals. The effect of bullying was deemed to reduce when children had access to non-fixed equipment and to negatively affect children with poor FMS. In addition, children's playground

physical activity was influenced by school policy to which small changes may have a marked effect on children's activity levels. Children's game preferences and teacher involvement also seemed to influence children's playground physical activity levels. Importantly, these findings raise the notion that multiple changes to the physical playground environment may be ineffective, if psychosocial and policy variables are not considered.

Bullying can impact on children's psychosomatic health [43, 44]. A large cross sectional study in New South Wales Australia indicated that almost one quarter of children are bullied [44]. Ferero *et al*. [44] found that the school environment was linked to health problems caused by bullying. Our research indicated that bullying appeared to have an effect on the playground activity levels of children. Children stated that other 'children wreck their games in the playground' and when asked 'what a nice playground looks like' some children made reference to psychosocial variables such as: 'no fights, feeling safe, people you can trust'. Some teachers stated that non-fixed equipment assisted in creating a more cohesive environment and reduced bullying. In addition, several teachers noted in schools where FMS were not a focus, a child's lack of FMS skills increased their chance of being bullied. In addition, previous research and our findings indicate an association between FMS and the use of similar skills in the playground or an increase in children's interest in physical activity [16, 45 ,46].

While there are many studies, which have investigated the incidence of bullying in the school playground [47–49], none have linked bullying and children's school playground physical activity levels. In contrast to the questionnaire component of this study, where principals did not believe that bullying affected playground physical activity levels, during the interviews principals, teachers and students indicated that bullying impacted on playground physical activity levels. Almost half the children stated that bullying affected the way that they played during break times. Three of the four schools where principals believed bullying impacted on children's playground activity levels were schools with the lowest levels of observed playground physical activity. Interventions focussing on playground physical activity may need to address playground bullying to be effective. Future intervention studies could assess the link between bullying and individual children's physical activity levels, playground design, the introduction of non-fixed playground equipment, school policy, how to structure play to prevent bullying and developing FMS for play.

While non-fixed equipment was believed to reduce the incidence of bullying, free access to non-fixed equipment was also seen to markedly increase children's school break-time playground physical activity in our previous study [37]. This finding was strongly supported by principal, teacher and student interview data. In addition, 13 of the 23 games preferred by children in break times involved non-fixed equipment (Table 1). Ten of the activities most preferred by children involved a ball (Table 1). These observations are supported by the environmental findings, which indicated that children involved in ball play were significantly more active [15]. In addition, principals, teachers and children agreed that non-fixed equipment created a more cohesive playground environment and prevented boredom and bullying. Other research and our previous study indicate that playground markings were generally seen to positively affect playground activity, which supports previous findings [15, 50, 51]. Future intervention studies should consider game preferences of children and investigate the impact on children's school playground physical activity following the introduction of suitable non-fixed equipment and playground markings to encourage such games.

The World Health Organization emphasized the importance of policies to encourage healthy behaviour in schools [52]. Our study indicated that changes to some policies could potentially increase children's playground physical activity levels. The policies included those that reflect safety issues which may in turn affect physical activity levels (e.g. No Hat, No Play), 'time available for play, and the impact of school uniforms on children's playground physical activity levels. Australia has high levels of skin cancer, and most schools have policies for skin protection such as No Hat, No Play; children are required to wear a hat or they

are punished by not being allowed to play. While this policy is effective in managing children's sun protection, it affects children's physical activity levels a different consequence such as the 'No hat, play in the shade' policy still gives children an opportunity to be active, while maintaining skin protection. In addition, it is recommended that children be offered the maximum time available for play during breaks as it significantly affects their physical activity levels [15]. For example, some schools allowed children to play as soon as their food was eaten, while others had a 10–20 min compulsory 'sitting time' for eating.

Little is known about how children's clothing affects playground physical activity levels. It is possible that school uniforms restrict children's playground physical activity levels. Most Australian children are required to wear school uniforms; males generally wear shorts and a shirt and most females wear dresses. Most children are required to wear a different uniform on sports days (1 or 2 days of each week). The fact that children are required to wear a different uniform to be active on sports day indicates that they are usually not dressed appropriately for physical activity. In addition, it is well documented that males are more active in school playground break times than females [9, 15, 53, 54], which may indicate that uniforms restrict females playground physical activity levels. When asked: 'what is the best type of clothing to play in' nearly all of the students (n = 28, both males and females) showed a preference for shorts and a T-shirt (an additional seven females preferred shorts or skirt and a T-shirt). A revision of school uniform policy may increase all children's playground physical activity levels; in particular the female population.

Approximately half the children believed playing with a teacher made them want to be more active. Approximately half the teachers believed teacher presence had a positive effect on children's physical activity levels. Teachers believed that children were more active if the teacher acted as a referee in their games. This finding contrasts with previous environmental findings [15], which indicated that children's playground activity decreased when teachers managed or observed their play. It may indicate that while children enjoy teachers participating in their games, when teachers begin to manage play, children's activity decreases. There were however limited opportunities where teachers participated in children's games. Most teachers indicated that it was not possible to participate in activity while they had a responsibility to monitor the playground.

A limitation of this study was the larger number of students from lower SES than from average SES. The lower numbers of average SES students responses may have limited the range of students perceptions reported as influencing physical activity in schools. In addition, interview data may have been limited as schools were from one geographic region of NSW Australia.

Conclusions

Previous research has not used qualitative data collection techniques when identifying children's school playground physical activity determinants. The findings from this research highlight the importance of this methodology and its contribution to the current literature. Several key determinants were identified. The issue of bullying was deemed to have a considerable impact on children's playground physical activity levels and may also affect children with poor FMS. The presence of non-fixed equipment was believed to create a more cohesive playground environment by preventing boredom and bullying. In addition, children's playground physical activity was influenced by school policy to which small changes may have a marked effect on children's activity levels. Importantly, these findings raise the notion that multiple changes to the physical playground environment may be ineffective, if psychosocial and policy variables are not considered.

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Conflict of interest statement

None declared.

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