This is the author's version of a work that was accepted for publication after peer review. This is known as the post-print.

Citation for author's accepted version


Citation for publisher's version


Notice: The publisher's version of this work can be found at:

http://dx.doi.org/10.1123/jpah.2015-0165
A qualitative investigation of Australian children’s perceptions to enhance school physical activity: The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study

Abstract

Background: There is more demand than ever for schools to equip children with the necessary skills to be physically active. The purpose of the Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study was to investigate elementary and secondary school children’s perceptions to enhance the school physical activity environment. Methods: Four Australian government schools (two elementary and two secondary) were recruited for the EPIC-PA study. During the study, 78 children were recruited aged 10 to 13 years. The focus group discussions consisted of 54 children (32 elementary and 22 secondary) and the map drawing sessions included 24 children (17 elementary and 7 secondary). Results: The findings from the EPIC-PA study revealed insight into uniquely desired features to encourage physical activity such as adventure physical activity facilities (e.g. rock climbing walls), recreational physical activity facilities (e.g. jumping pillows), physical activity excursions, animal activity programs and teacher-directed activities. In addition to specific features, students revealed a host of policies for equipment borrowing, access to sports equipment/areas, music during physical activity time and external physical education lessons. Conclusions: Understanding the multiple suggestions from children of features to enhance physical activity can be used by schools and researchers to create environments conducive to physical activity participation.

Keywords: physical activity, elementary schools, secondary schools, school environments, recess
Background

A reduction in children’s physical activity opportunities worldwide\(^1\) have underlined the importance of schools as a vital place to facilitate children’s physical activity. With a developing societal focus on schools to accommodate children’s physical activity,\(^2\) pressure is growing on schools to ensure children are provided with the necessary tools to be physically active.\(^3\) Despite such demands, literature has revealed a range of institutional and teacher-related restrictions on the provision of effective school physical education (PE).\(^3\) A crowded curriculum, budget, time and sporting equipment constraints can restrict the delivery of PE.\(^1,4\)

Teacher-related restrictions to PE delivery have included low confidence to teach PE, declining teacher interest, negative past PE experiences, inability to plan lessons and insufficient levels of knowledge and expertise.\(^5,6\) With the escalating nature of teachers’ roles, other alternatives to developing children’s physical activity must be recognized. Providing children with insight and understanding of methods to be physically active is an important consideration to develop children’s skills for lifelong habits.\(^7\) School is a time for children to understand the world through active play and, as children are directly influenced by a range of school environmental factors that influence their physical activity, their schools spaces should be implemented in such a way to enhance physical functioning and development.\(^8,9\) External to the schoolyard and within the classroom, children may have reduced access for physical activity opportunities. Researchers should therefore gain a greater insight and understanding of school play spaces and ensure school leaders can create school environments in a manner that maximizes children’s opportunities for movement and participate in enjoyable movement experiences.\(^10\)

Outdoor play within schools has been revealed to be a powerful developmental method to complement and supplement the formal classroom curriculum.\(^11\) There are widespread goals to improve schoolyard design to promote enjoyable physical activity opportunities in schools.\(^12\)

Countries worldwide (UK, Canada, USA, Sweden, Wales) have acknowledged how important
children’s spaces are for learning, leading to a host of policies to develop school grounds for
children’s activities. Movement via play has been referred to as one of the most significant,
natural forms of childhood learning and has been linked to improvements in a wide range of
physical, cognitive and social development. A number of studies have trialled school
environment strategies by implementing schoolyard markings, greening projects, extra
schoolyard equipment, sporting equipment and household items that have resulted in
positive physical activity outcomes. These interventions challenge the role of traditional school
schoolyard design in developing children’s non-curricular physical activity; providing extra
motive to explore children’s perceptions of the factors that influence non-curricular physical
activity participation. This evidence is supported by recent research suggesting that enhancing
school play spaces can also lead to improvements in social skills, creativity and improved
cognitive functioning.

A well-designed school environment can facilitate physical activity, social and cognitive
improvements, yet recent national trends suggest a number of schools have reduced spaces or
equipment, contain crowded spaces and administer policies restricting the usability of spaces
for children’s physical activity. School leaders rarely consult children when planning and
designing school physical activity environments, approaching the process from an adult
perspective of what teachers believe children would want and enjoy. The reliance on
adults in the design and planning of children’s physical activity environments can lead to
undesired physical activity settings, resulting in long-term consequences for children’s social
and emotional development. In addition, children may believe they have minimal influence
on the set up of their school environments to engage in desired activities. Children’s
perceptions are an important consideration for teachers and schools when planning school
environments for physical activity. Despite children generally being the main consumers of
such environments during sport, health, physical education and non-curricular periods, adults are often the decision makers when planning school physical activity environments.

As children are the main users of school spaces it may be beneficial to also obtain their perceptions, rather than those teachers whose main purpose within a schoolyard is predominantly in a supervisory capacity only, when designing play areas. There are limited investigations of children’s perceptions of school play spaces. A recent study across five Turkish schools identified that many children enjoyed active games, spending recess in the schoolyard and having an area to produce food. Almost half of the children believed their schoolyards were too small in size and lacked activity opportunities, trees and greenery. In another study, the influences on children’s schoolyard physical activity choices were assessed via a photo ordering technique during a focus group format. Additionally, it was revealed that children perceived a need for improved provision of equipment, improved variety of schoolyard equipment and to ensure ‘older’ elementary children had access to fixed schoolyard equipment. Children also desired colored bitumen markings with minimal lines, grassed areas to run and play games on. These findings identified school environmental features children perceived would facilitate physical activity, however a limitation of these studies is that they only examined perceived influences on children’s physical activity within an elementary school context. In addition, little is understood about adolescent perceptions of their ideal secondary school spaces to engage in school physical activities.

Increasing understanding of the features children’s perceive to enhance school physical activity environments will allow for more effective interventions targeting youth physical activity participation. Within Australian schoolyards, the most popular physical activity features include grassed areas (94%), basketball courts (89%), football ovals (80%), netball courts (74%), cricket pitches (56%), soccer pitches (38%) and even tree climbing (17%). To date,
The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study

there has been limited insight of the perceptions of both elementary and secondary school children of features to enhance the school physical activity environment. Providing an understanding of children’s ideal physical activity facilities could help teachers facilitate increased enjoyment, physical activity and wellbeing levels among children and provide considerations for planning and design of school-based physical activity. Although schools are acknowledged as a key setting for children to engage in physical activity, it still remains unclear which specific features elementary and secondary children’s desire in order to enhance their physical activity environments.

This Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study therefore addresses an important gap within the literature relating to children’s engagement in school-based physical activities. The EPIC-PA study employed a mixed methods approach using focus groups and map drawing, which aimed to investigate elementary and secondary school children’s perceptions of features to enhance the school physical activity environment.

Methods

Participants

The Principals of four government schools (2 elementary and 2 secondary) in the western region of Victoria were randomly selected and invited to participate in the EPIC-PA study by researchers. All schools from the western region were consecutively numbered, and a random number generator was used to select the four schools. Elementary school children (all Year 5 and 6 children; n=197) and secondary school children (all Year 7 and 8 children; n=643) were invited to participate via a letter and consent form distributed. Year five and six elementary school children were invited to participate as children over eight-years-old have been revealed to be more capable of accurately self-reporting their own health behaviour. In order to
The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study compared the influences on physical activity between elementary and secondary school children. Year seven and eight secondary school children were invited to participate.

All children interested in participating in the EPIC-PA study were instructed to obtain parental consent and return their consent forms to the general office of their school. The first 15 children from each year level were invited to attend the scheduled focus group and/or map drawing session. During this study, 78 children from all four schools aged 10-13-years-old (50% females; 50% males) returned their consent forms by the due date and all children who volunteered participated in the study (Year 5 = 29; Year 6 = 20; Year 7 = 29). There were no year eight children that participated in the study. The focus group discussions consisted of 54 children (32 elementary and 22 secondary) and the map drawing sessions included 24 children (17 elementary and 7 secondary).

Ethical approval for the study was obtained from the University of Ballarat Human Research Ethics Committee, the Department of Education and Early Childhood Development (DEECD) and permission was gained from the school Principals.

Focus Group Discussions

For the present study, seven focus groups (4 elementary school and 3 secondary school) were conducted for children who agreed to participate. The six to ten children in each focus group were asked a series of questions using a semi-structured interview schedule in relation to their desired features to enhance the school physical activity environment. Focus group questions included: ‘If you were designing your ideal school environment to encourage physical activity, what would you include?’ and ‘Why would you include these features to enhance the school physical activity environment?’ The focus group discussions were conducted for 30-60 minutes in a quiet room separate to where the map drawing exercise took place simultaneously to prevent the discussion influencing the drawings. All focus group discussions were audio
The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study recorded and detailed comments were taken of children’s focus group answers and body language during each session to aid transcription.

**Map Drawing**

Map drawing has been revealed as an effective measure of children’s knowledge of their environments. Map drawing has also been used to examine children’s cognitive thoughts about their environments by providing children opportunities actively illustrating thought patterns. Implementing the use of map drawing, in addition to the focus group discussions, aimed to provide a more comprehensive insight into children’s perceptions of features to enhance the school physical activity environment.

Sheets of A3 sized paper were distributed to children including an instruction sheet with the description of each mapping task that asked elementary (Figure 1) and secondary (Figure 2) children to draw their: ‘ideal space for physical activity.’ At the completion of the focus groups, children were invited to explain their maps to the researcher at which time they were audio recorded. This ensured that map features voiced by children for physical activity were correctly interpreted to avoid misunderstanding, complement the focus group perceptions and to clarify each child’s perspective of their drawings.
The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study

Figure 1: Map drawings of elementary children illustrating their ideal physical activity features

![Map drawings of elementary children illustrating their ideal physical activity features](image1)

Figure 2: Map drawings of secondary children illustrating their ideal physical activity features

![Map drawings of secondary children illustrating their ideal physical activity features](image2)

Data Management

All focus group data was de-identified and referred to by pseudonym. Data collected from focus group sessions were transcribed verbatim and analysed using the NVivo version 8 software package (QSR International). All audio recorded focus group and map drawing explanations were transcribed by a trained transcriptionist. The analysis of the transcriptions were based upon the emerging themes, similarities and differences within and between the elementary and secondary school groups’ ideal features to improve the school physical activity environment. The information provided in the focus groups and map drawing explanations within the EPIC-PA study were used to determine suggestions from children of their ideal features to enhance the school physical activity environment.
Results

Whilst a range of sporting facilities are highly common within Australian schools for physical activity participation, the results reveal insight into further desired features to encourage school physical activity such as adventure physical activity facilities (e.g. rock climbing walls), recreational physical activity facilities (e.g. jumping pillows), excursions for physical activity, animal physical activity programs and teacher-directed activities. Sporting facilities that aren’t as common in schools were also identified such as running tracks. In addition to specific facility features, elementary and secondary students revealed policies within the school environment for physical activity such as equipment borrowing policies, access to sports equipment/areas, music during physical activity time and additional PE lessons (including external PE).

Adventure physical activity facilities

The adventure physical activity facilities that were regularly mentioned by elementary school groups as an ideal feature to enhance the school environment for physical activity included indoor rock climbing walls, low ropes courses and higher equipment such as monkey bars, “...like an indoor rock climbing wall- no harness, but no really big risks. If you fall it’s not going to be far to hit the ground” (Elementary school male); “...low ropes course...make it a bit challenging. Have like a mini vertical climbing pen...” (Elementary school male); “...they should make a set of high monkey bars, because they are really low everywhere” (Female elementary child).

Similarly, within the secondary school groups children mentioned adventure physical activity facilities such as rock climbing walls, the potential for climbing structures, adventure flying foxes, toboganning, tyre swings and slippery slides as features to enhance the school
environment for physical activity. The rock climbing walls and adventure flying foxes were the most commonly mentioned features “Definitely a rock climbing wall, just a huge wall and you can abseil down it as well...lots of spaces...with soft mats and stuff” (Secondary school male); “A rock climbing wall...ropes at the top and everything...really long so like when you get to the top...there's a ladder you can climb up...go down a big slide” (Secondary school female); “Adventure flying fox...have like a seat and you hang on to it and because it’s bush land you could make it go down the hill” (Secondary school male); “…the one (flying fox) with the triangle on thick ropes...need to hold on...have a harness on...its on the discovery channel” (Secondary school female).

Animal physical activity programs

In the secondary school groups, many of the secondary school females reported that they would like to see animal physical activity programs such as dog walking and horse riding implemented within the schoolyard for enjoyment and activity, “...lots of animals...it can be pretty fun to be physically active with...muck around with dogs and all that, ride horses” (Female secondary child); “…dog walking would be great...it would be great to have a big area to go dog walking and running” (Secondary school female); “horse riding...you could block off the oval” (Secondary school female).

Excursions to encourage physical activity

A number of ideas were identified within the excursions for physical activity theme by both female elementary and secondary children. The female suggested excursions for physical activity to places with sporting facilities such as pools, community sporting organisations and a rotation of excursion venues for activities, “…go out of the school sometimes to be active, like two or three activities. Go to the minor dome or major league, stuff like that”
The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study

(Primary school female); “I think more excursions...you could go to YMCA for an excursion, like we are going swimming this term” (Secondary school female); “One class could go to the pool, the other class horse riding, the other class hunting” (Secondary school female).

Maintaining physical activity facilities

Facility maintenance was also seen as important, especially by elementary school females, “…probably updating the facilities because they’ve been there for a very long time” (Elementary school female); “…better football field, instead of some parts muddy and some parts really hard” (Secondary school male).

Natural environmental features

Elementary children suggested that the inclusion of more hills would be an effective feature for steep schoolyard physical activity challenges and adventures, “I’d put in a hill sort of thing...be cool to have a hill to roll down” (Elementary school male). The inclusion of trees were also suggested for shaded play and climbing, “Lots of trees and branches you can climb” (Elementary school female).

Similarly, secondary children also suggested that the addition of trees would be ideal for climbing, swinging and hanging, “There should be lots of trees. I love trees and want to climb them” (Secondary school male); “…we could have a tree over the swimming pool and a rope hanging off it that you could swing into the swimming pool” (Secondary school female).

The other common natural environmental feature identified by secondary children included water sources (e.g. access to a lake) for kayaking and sailing activities; “…a lake full of water...to do kayaking...sailing” (Secondary school male).
Fitness/gym equipment

A key theme identified by the male elementary children included the implementation of fitness/gym equipment for use within schools, “…probably like a machine where you hold on to, sort of like walk” (Elementary school male); “Sort of like a treadmill thing and you get heaps of speed” (Elementary school male).

Policy considerations

Some elementary children perceived that school should be updating the facilities and equipment more regularly and should be including more physical education lessons; “…it can be boring (school physical activity)...you need a change every now and then cause...you would be doing the exact same stuff” (Elementary school male); “I’d probably include more PE lessons” (Elementary school female).

In contrast, the male secondary children perceived that more complex policies such as ID card scanning access to sports equipment, more lenient equipment borrowing policies and the implementation of music during school activities, “…just scan your child ID card and get to borrow sports equipment, because if you’re not down there in 5 minutes you can’t borrow” (Elementary school male); “Music playing when you are being active” (Elementary school male). The female secondary children were seeking more variety in spaces and extra cooling comfort during indoor activities, “A space to socialise, a space to hang out, a space for sport...all different spaces for all different people” (Secondary school female); “…there should be more air conditioning when we are active inside” (Secondary school female).

Recreational physical activity facilities

The most widely reported features desired by children were recreational physical activity
facilities. Many of the elementary school children desired activity gyms, jumping pillows, mazes, slides, min golf, obstacle courses, Nintendo Wiis, waterslides and mega bikes with pedals, “I reckon there should be a…fun activity gym...like swing off things and land in a foam pit...do little obstacle courses and stuff” (Elementary school male); “I would put like a bouncy sort of thing in like a jumping pillow” (Elementary school male); “I’d probably have an obstacle course or something” (Elementary school male); “Would be cool to have big mazes, big hedges and you have to find a way out and that” (Elementary school female); “I’d have mini golf” (Elementary school female).

Similarly, the secondary children desired features such as Nintendo Wiis, skate parks, jumping castles, tunnels, bikes and noted that they were too old for traditional schoolyard facilities, “A Wii. You could have a tv and then do the sport and watch other people do the sport” (Secondary school female); “I think it’s important to have a skate park, although you would need more recess time” (Secondary school female); “…bikes...that would be cool” (Secondary school female).

**Sporting facilities**

Both elementary and secondary children had a desire for a range of sporting facility features that included detachable equipment items to ensure sporting facilities were multi-purpose, extra court spaces, running tracks, swimming pools, softer surfacing, trampolines and large foam pits, “...little holes where you can put the tennis nets in. So that you can like take them out and everything like that” (Elementary school male); “…an extra big court to practice soccer around it” (Elementary school male); “I would do lots of running around school...probably like a running track (should be included)” (Elementary school female). The most common sporting facilities feature mentioned by the secondary children included the
desire for gymnastic facilities, “I’d have a massive trampoline and then a massive foam pit”
(Secondary school male); “Trampolines and stuff, but have mats on the side. You could have
like foam mats and blocks” (Secondary school female).

Teacher-directed physical activities

A number of male elementary school children mentioned their desire for a range of teacher-
directed activities including additional physical education classes and other learning activities
(e.g. bike programs), “Some of the teachers could hold additional activities outside phys ed
classes and if you didn’t want to do them you could do other activities you want”
(Elementary school male); “…some teachers…teach you to go around on the bike or
something” (Elementary school male).

Discussion

The EPIC-PA study provides greater understanding for researchers of the ideal features both
late elementary and early secondary school children perceive would enhance the school
physical activity environment. Such features can be used by school decision makers to inform
future physical activity interventions and planning. Factors within the physical environment
that can facilitate or restrict children’s physical activity have been examined, yet there is
limited research exploring children perceptions of ideal features that will enhance the school
physical activity environment. Within Australian schools, the most popular physical activity
features include grassed areas, basketball courts, football ovals, netball courts, cricket pitches,
soccer pitches and even tree climbing. Similar to the children’s perceptions within the EPIC-
PA study, a frequently studied physical environmental factor (mainly in secondary schools)
has been the availability of facilities in the outdoor school setting (e.g. sporting courts and
ovals). The availability of facilities has had mixed outcomes with a sledding hill, soccer
field and green space being associated with children’s physical activity. In contrast, no association has been found for ball areas, skiing areas, water, woods and grass sporting fields. However, studies examining the quantity of physical facilities and sport-specific facilities have revealed positive correlations with children’s physical activity. These EPIC-PA study findings suggest that not all physical activity facilities correlate with physical activity participation, yet schools could focus on the provision of substantial equipment to ensure children have an optimal chance to engage in their desired types of physical activities.

Understanding how children are physically active within the physical environment is important to identify and develop effective school interventions to enhance children’s wellbeing, physical activity and enjoyment. Consistent with a 2012 review, the present study highlights a need for greater facility provision and variety of facilities. In addition, access to fixed facilities for older children have been identified as being positively associated with higher physical activity levels. Similar to the current findings, previous mixed methods research has revealed children have preferences for grassed areas for running/games and children have highlighted the benefits of metal structures in comparison to wooden facilities in schools for physical activity. As some children may prefer to be physically active on fixed facilities made of different materials (e.g. wood, plastic, metal), providing children with the opportunity to be active with different types of materials of their choice could help to facilitate children’s physical activity participation. Providing a variety of physical activity facilities has been consistently reported to be a key factor positively correlated with children’s physical activity. Providing children with diversity of options can promote ‘choice’, established to be a major aspect of children’s enjoyment of the school physical activity environment. Ensuring there are facilities within the school that promote adequate choices can accommodate physical activity for children’s different individual preferences for
The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study

physical activities or facilities and ensure that facilities can cater for different sex, ages and weight statuses.\(^3\)\(^8\)

A number of suggestions from the EPIC-PA study to encourage school-based physical activity have been reflected in previous studies. A recent study identified that children perceived sporting facilities, adventure type facilities and fixed facilities as facilitators for school physical activity\(^2\)\(^4\) in contrast to lounge and food areas. Features within the natural environment (e.g. trees, grass and rocks) have also been perceived as important influences to engage children in school physical activity.\(^1\)\(^7\),\(^3\)\(^9\)-\(^4\)\(^1\) It has been revealed that spaces need to be suitable for certain activities (e.g. football on a field rather than court) and that weather could be a key influence on school physical activity patterns.\(^4\)\(^2\) In contrast, children can perceive the size of spaces, crowded spaces, conditions of facilities and type of weather as potential barriers to physical activity in schools.\(^4\)\(^2\) It is important to gain an understanding of children’s perceptions to enhance school-based physical activity to inform interventions and to develop self-report measures assessing variables from the children’s perspectives.\(^3\)\(^5\)

An interesting finding from the present study was the degree of similarity in the themes for both late elementary and early secondary school children to encourage physical activity. The main thematic differences between the groups were the suggestions for more teacher-directed physical activities such as bike classes (elementary) and the presence of animal physical activity programs such as dog walking and horse riding stables (secondary). Such similarities could be due to the closeness in age, as many of the year seven secondary children were just one or two years older than the elementary children. The similarity in perceptions contrast the decline in physical activity evident during the transition between elementary and secondary school.\(^2\)\(^4\),\(^4\)\(^3\),\(^4\)\(^4\) The lack of connection from elementary to secondary school environments to
facilitate physical activity has been reflected by a study conducted by Haug and colleagues. Haug discovered that children’s physical activity peaked in year six, followed by a significant decline in year seven for females and in year eight for males. Despite children’s perceptions being similar in the present study, it could be that there is a lack of facilities in secondary schools that cause physical activity declines. Secondary school children have been found to be three times more likely to be physically active if schools introduced more facilities. Although secondary school children have perceived a range of suggestions to enhance their physical activity environment in the current study, there is often an increased lure of sedentary opportunities at secondary schools that can negatively influence adolescents’ energy, emotions and interest for physical activity. An increased emphasis on winning and losing in secondary schools associated with structured competition can also reduce secondary children’s motivation for physical activity. In addition, the smorgasboard of sedentary opportunities at secondary school could be influencing adolescents’ desire for socialisation, rather than moving around. Further research into the connection between secondary school facilities and physical activity is therefore warranted.

It is widely recognised that many adolescent females have lower levels of health-enhancing physical activity than males, however it is clear in the present EPIC-PA study that many of the suggestions for physical activity between genders were similar at both the elementary and secondary school levels. Although, the adolescent females suggested some features that contrasted males, including the presence of animal programs and excursions to encourage school-based physical activity. The use of dog walking programs have been discovered to have an influence on the physical activity levels of females and is an area warranting further investigation. The quality of facilities, activities offered and equipment available within the physical environment of secondary schools are seen as important for adolescent females’
Male elementary school children also revealed unique themes such as teacher-directed activities and fitness equipment to enhance the school physical activity environment. The male elementary school children’s desire for teacher-directed activities could reflect the elementary age group being extra dependent on adult role models, directions and instructions for skill development. Therefore, considering the unique perceptions of either gender to enhance the school physical activity environment could be crucial to developing engagement in school physical activity participation.

Similar to the perceptions of children to enhance the school environment in the present study, fixed equipment and obstacle courses have been reported to facilitate children’s physical activity. Fixed equipment has been shown to be positively associated with the physical activity levels of junior adolescents. In contrast, the themes identified in the present study such as climbing areas (elementary & secondary) and an enclosed area (secondary) have been previously reported to have no association with children’s physical activity. Furthermore, no association has been identified for fixed equipment facilities with the physical activity of female adolescents. Additionally, there was little mention of the inclusion of features to counteract weather conditions, despite weather conditions being an influential variable on children’s enjoyment of physical activities.

Overall, the elementary school children tended to suggest more ‘play-type’ features such as rolling down hills, jumping pillows and obstacle courses that contain an element of risk to enhance the school physical activity environment. Risk taking is known to increase children’s confidence in skills and ensure the development of learning paths and dispositions. The secondary school children tended to suggest more ‘adventurous’ and suggested facilities such as adventure swings, skate parks, horse riding stables and racing tracks. Secondary school
children often enjoy experiencing higher levels of motor skill development\textsuperscript{52} and more structured physical activities as they age.\textsuperscript{11} It should be noted that a range of suggestions perceived by the children wouldn’t be plausible to implement due to costs, legal responsibilities and supervision requirements associated with school environments, however the skills associated with each suggestion can be considered by teachers. It should also be noted that children’s enjoyment of school play-related aspects can vary significantly from day to day.\textsuperscript{36}

The methodology used in the EPIC-PA study was innovative and to our knowledge was one of the first studies that have employed a combination of focus group discussion with map drawing to determine children’s perceptions of features to enhance the school physical activity environment. The even gender distribution and detailed information obtained from children about their ideal school environments for physical activity were strengths of the EPIC-PA study. However, it should be noted that the map drawing task may have been intellectually challenging or not suited to some of the children. Previous studies have used mapping techniques with children aged 10-15 years\textsuperscript{24,29,53} indicating that such a method is suited to children’s capabilities. Having teachers nearby to provide assistance to children when needed, helped to reduce potential problems such as child distractions and any clarification of focus group questions or map drawing instructions.

It is acknowledged that the results from the EPIC-PA study are not widely generalizable to other school populations due to the involvement of two elementary and two secondary schools from regional areas of Victoria. Nonetheless, the EPIC-PA study provides the decision makers, school leaders and teachers associated with school environments to gain insight into key features desired by children to enhance school environments for physical
activity, a key developmental setting. In addition to the physical environment features, it is important teachers develop policies that ensure children are supported to be physically active. Physical activity policies can be unique to each school (Commonwealth of Australia, 2009) and in order to enhance physical activity environments it is important to ensure written physical activity policies are matched with the implementation of physical activity features.

Conclusion

This mixed methods EPIC-PA study provides insight into both elementary and secondary children’s perceptions of features to enhance their school physical activity environments. Whilst a range of sporting facilities such as courts and ovals are very common within Australian schools for physical activity participation, the present study also revealed insight into further desired features to encourage physical activity such as adventure physical activity facilities (e.g. rock climbing walls), recreational physical activity facilities (e.g. jumping pillows), physical activity excursions, animal activity programs and teacher-directed activities. In addition to specific facilities, elementary and secondary students revealed policies within the school environment for physical activity such as equipment borrowing policies, access to sports equipment/areas, music during physical activity time and additional PE lessons (including external PE). The multiple suggestions of features to enhance physical activity perceived by elementary and secondary students’ can be used by teachers to gain an awareness of and create environments conducive to enhancing school-based physical activity levels.

Acknowledgements

The two elementary and two secondary schools and the children must be thanked for participating in the project. Professor XXXX and XXXX are acknowledged for their input
The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study into the design of the study. The data collection process for the EPIC-PA study was conducted whilst XXXX was originally supported by a PhD scholarship from the University of XXXX. The write up of the EPIC-PA study was conducted at XXXX University.

References


The Environmental Perceptions Investigation of Children’s Physical Activity (EPIC-PA) study


47. Bauer KW, Yang YW, Austin SB. "How can we stay healthy when you're throwing all of this in front of us?" Findings from focus groups and interviews in middle schools on environmental influences on nutrition and physical activity. *Health Education Behavior*. Feb 2004;31(1):34-46.


