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How Play Streets supports the development of physical literacy in children:

A research review

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For further information

Professor Matthew Nicholson

Centre for Sport and Social Impact
La Trobe University
Victoria 3086 Australia

T +61 3 5444 7905
E m.nicholson@latrobe.edu.au
W www.latrobe.edu.au/cssi

Lauren Thorn

Centre for Sport and Social Impact
La Trobe University
Victoria 3086 Australia

T +61 3 9479 2312
E l.thorn@latrobe.edu.au
W www.latrobe.edu.au/cssi

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Introduction

Play is an activity that is essential to supporting children's wellbeing and development. Play is linked to improved mental health and wellbeing and to better physical health (Hills et.al., 2011), resulting in happier, more confident children who are better at dealing with stress (Children's Commissioner, 2018). Play also supports children's cognitive and social development, teaching them to develop and use language effectively, as well as solve problems collaboratively and independently (Children's Commissioner, 2018). There is also growing evidence that supports children's play benefitting the family and wider community via improved family wellbeing and increased social action and volunteering (Gill, 2014; Meyer et.al., 2019).

By definition, play encompasses a philosophy that supports enjoyment and recreation as opposed to productivity and purpose (Nijhof et al., 2018). Due to issues created by the rise of technology and the internet, increasing space pressures from housing densities and escalating safety concerns, levels of active play are decreasing amongst children (Webb-Williams, 2017). In order to combat the decrease in active play and growing levels of sedentary behaviour, organised street play has been initiated both locally and internationally, encouraging children and families to get outside and connect with their neighbours through fun and inclusive physical activities. In these street play initiatives, streets are temporarily closed off, in order to create a safe environment for children to play. They are designed to support unstructured play, "the spontaneous activity in which children engage to amuse and occupy themselves" (Burdette and Whitaker, 2005:46), and in doing so allow young people to express themselves with freedom and autonomy, without restrictions. It is hoped that this type of environment subsequently facilitates the development of physical literacy in the form of physical, psychological, social and cognitive capabilities.

Physical literacy is centred on the skills, knowledge and behaviours that give children the motivation and confidence to establish and enjoy active lives (Sport Australia, 2019); it has recently been given prominence by the Australian Government with the release of Sport Australia's Australian Physical Literacy Framework in 2019. The Framework aims to create a common understanding and language, which supports and aligns consistent physical literacy development in Australians, in particular children, and across the sport, education and health sectors (Sport Australia, 2019). With growing support for the concept within these sectors, examining the alignment between physical literacy and sport and physical activity programs and initiatives, will assist providers to enhance participants' holistic development of the skills required to be active for life. By examining the active play that occurs through Play Streets via the lens of physical literacy, its unique contribution to physical literacy development can be determined, in addition to highlighting and affirming the crucial role play offers in creating and sustaining active lives for children.

Purpose

In July 2019, Play Australia received a Sport Australia 'Move it AUS' Participation Grant (the Grant) to deliver 1000 Play Streets; a national movement to support Australians to reclaim their local streets as places to come together with neighbours and play, to improve the health and wellbeing of individuals and communities.

Play Australia commissioned the Centre for Sport and Social Impact (CSSI), from La Trobe University, to undertake the evaluation of 1000 Play Streets for the Grant. The evaluation included exploring the evidence around organised street play and its contribution towards developing physical literacy in children. *How Play Streets supports the development of physical literacy in children: A research review* (the review) heralds the commencement of a knowledge base that advocates for street play and its alignment to physical literacy. It aims to outline the evidence that highlights development of many of the physical, psychological, social and cognitive capabilities in children through Play Streets. The Review also maps Play Streets to the Australian Physical Literacy Framework and in doing so highlights its strengths from a physical literacy perspective. The report also explores evidence-based approaches that could further enhance physical literacy outcomes in children through Play Streets initiatives. This report will support Play Australia and its stakeholders to understand and communicate the strengths of Play Streets in developing physical literacy in children and consider opportunities to strengthen it further through Play Streets.

The review comprises three components:

1. A literature review of Australian and international literature to generate an evidence base for Play Streets and its association with developing physical literacy.
2. Informed by the evidence, the development of a visual representation of Play Streets mapped to the Australian Physical Literacy Framework (Sport Australia, 2019), in order to highlight specific alignment of Play Streets to the physical, psychological, social and cognitive capabilities of physical literacy.
3. Strengthening physical literacy in Play Streets – a description of evidence-based approaches that could further enhance physical literacy outcomes in children participating in Play Streets.

For the purpose of this review, 'Play Streets' and 'organised play streets' are used interchangeably to describe the concept of a community-led, organised play street that involves families closing off a street or streets to enable active play opportunities for children.

The evaluation included exploring the evidence around organised street play and its contribution towards developing physical literacy in children. This review heralds the commencement of a knowledge base that advocates for street play and its alignment to physical literacy.

Approach

The research review involved undertaking desktop research and analysis through employing: (1) literature review; and (2) policy interpretation and application. The research was supported by meetings between the CSSI project lead and Play Australia's 1000 Play Streets project lead.

Literature review

A review of relevant literature was undertaken, in order to synthesise the evidence for organised street play and its association towards developing physical literacy.

A search of literature published within the past 10 years was conducted using Google Scholar, using combinations of the following key search terms.

- Child OR Children OR Family
- "Active play" OR "Street play"
- Outcomes OR Benefits
- "Physical Literacy" OR "Physical Activity" OR Physical OR Psychological OR Affective OR Social OR Cognitive

The search also included existing research material and grey literature compiled by Play Australia.

Policy interpretation and application

Following the literature review referred to above, a mapping exercise was undertaken to align Play Streets physical literacy objectives, outcomes and activities to the *Australian Physical Literacy Framework* (hereafter 'the Framework') (Sport Australia, 2019). This involved analysis of language established through the literature review, to identify key words and terms that aligned to the elements of the four domains of the Framework. The process also utilised aspects of Sport Australia's *Physical Literacy Program Alignment Guidelines* (Sport Australia, 2019). The following approach was taken:

1. Mapping of program outcomes to the elements of the Framework
2. Mapping the synonymous key words and terms to the elements of the Framework
3. Identifying the activities that explicitly develop physical literacy elements
4. Analysing how the elements could be further developed in Play Streets to deliver physical literacy outcomes.

Findings

The research review is presented in three parts: (1) How Play Streets supports the development of physical literacy in children; (2) Play Streets visually mapped to the Australian Physical Literacy Framework; and (3) Strengthening physical literacy in Play Streets.

Sport Australia (2019) has organised the Framework by categorising physical literacy of 30 movement-related skills, knowledge and behaviours into four interrelated domains – physical, psychological, social and cognitive. Development and application of the elements are interrelated and differ based on the various context, capability and task. This section outlines the evidence supporting Play Streets development of elements of the four domains of physical literacy in children.

How Play Streets supports the development of physical literacy in children

Physical capabilities

Sport Australia (2019) describes the physical domain as the application of physical skills and fitness to move in different ways and in different environments. This domain focuses on development, coordination and the application of fundamental movement skills (i.e. balance, locomotor and throwing, catching and striking along with moving with different objects and equipment). It also describes the fitness capabilities that can be developed to support ongoing engagement and progression in sport and physical activity.

Research shows that a positive relationship has been established between the amount of time spent outdoors and the levels of physical activity in a child (Carver et al., 2008). As a child spends more time outside their house, their levels of moderate-to-vigorous activity and cardiorespiratory fitness will rise (Schaefer et al., 2014). Since Play Streets encourages participation in an outdoor setting, this provides evidence showing the impact Play Streets has on levels of physical activity. In Meyer et al.'s (2019) systematic review of Play Streets, these initiatives were more effective in increasing levels of vigorous physical activity as opposed to moderate levels. Zieff et al. (2016) observed that children (<14) were the age group most engaged in vigorous physical activity through Play Streets programs. There are also positive correlations between the amount of time spent outdoors, and volume and intensity of physical activity, with the length of time a street is closed for (Children's Commissioner, 2018). Taken together, these findings suggest that longer street closures will have a direct and physically beneficial effect on young children.

By engaging in higher levels of physical activity, children can enhance their levels of physical literacy in several ways. Moderate-to-vigorous physical activity in children that occurs from involvement in Play Streets contributes to an overall improvement in physical health through cardiovascular development and the maintenance of a healthy weight (Children's Commissioner, 2018). Although the components of physical health are important for a child, one can argue that Play Streets should also aim towards improving a child's fundamental movement skills (e.g. balancing skills, locomotor skills such as running and jumping and hopping and ball skills such as catching and throwing). Learning how to utilise one's body for specific exercises can generate far more long-term benefits than focusing on a child's current level of fitness, for example. This is because physical health has a greater tendency to fluctuate over time in comparison to motor skills, which develop throughout the lifecourse.

Additionally, if available, children should also be given the opportunity to use play equipment as part of a Play Streets initiative. A survey conducted by Playing Out (2017) in Bristol (UK) revealed that 85% of the children either learnt or improved their physical skills when scooting, alongside riding a bike (80%), skipping (66%) and roller-skating (63%). Hosting a Play Street therefore creates an opportunity for children to practice these skills in a safe and monitored environment.

Psychological capabilities

The psychological domain of the Framework focuses on the feelings, attitudes and emotions a person has towards movement (Sport Australia, 2019). The elements reflect a person's ability to enjoy and have the confidence and motivation to participate in a range of sports and physical activities, along with being able to reflect upon and manage emotional and physical responses related to movement.

A crucial objective of the Play Streets philosophy is the importance of fun and enjoyment. In a study conducted by Murray and Devechi (2016), 92% of children mentioned that 'having fun' was a key element in their involvement with a Play Street. This 'fun' factor was facilitated primarily by the unstructured form of activities that Play Streets promote. The reason why an emphasis is placed on fun and enjoyment over skill-based activities, for example, is because these programs assert that it is imperative to establish positive associations and experiences with outdoor play and physical activity from a young age (de Rossi et al., 2012). Engaging in physical activity in a fun and enjoyable way improves young children's self-perception and perceived confidence and in turn motivates them to continue being physically active (NICE, 2007). The unstructured play approach promoted by Play Streets where children can decide what to do, with whom and how, can enhance their self-esteem, autonomy and confidence (Bento and Dias, 2017).

Active outdoor play has several psychological benefits for young people. In addition to physical health benefits, physical activity is frequently found to support and improve mental health and wellbeing (Children's Commissioner, 2018). Supporting mental health through active play is conducive with the Play Streets environment, as children have an opportunity to express primary emotions such as fear, anger, sadness and joy in a controlled setting, all of which contribute to the development of regulating self-emotion (Play England, 2008).

Regular opportunities for street play creates a physical and social connection to the places in which children explore their environment, learn about it, and care about it (Nitecki et al., 2016). Sobel (1993) found that young children who explore places around them through play build their self-identify through these places, linking their environment to their social and emotional development. Participating in Play Streets therefore enables the opportunity for children to explore places and spaces in their immediate environment through play, as well as develop their self- identify and connection to where they live and who they share these places and spaces with.

Social capabilities

The social domain of the Framework encompasses the development of social skills, which facilitate enjoyment of and effective interact with others in sport and physical activity. Sport Australia (2019) describes the social domain of physical literacy as being able to build and maintain relationships, lead and take part in team activities collaboratively and ethically and exhibit inclusive behaviours.

As children and communities are brought together through the temporary closure of a street, greater opportunities to develop social skills exists. Respondents from Playing Out's (2017) survey, of Play Streets in Bristol, found that 88% of children interacted with other children and that 83% had been interacting with adults. With regards to The Hantown Street Play Project, 61% of respondents believed that 'Street Play is a good way for children to make new friends' (Murray and Devechi, 2016).

Interacting through movement provides children with the prospects of building new friendships. Active play encourages children to learn social skills such as collaboration, negotiation, leadership and empathy, all vital components that help individuals communicate and form relationships (Wood and Martin, 2010). Social reciprocity and the way in which children communicate through verbal and non-verbal interactions might also develop through play (Murray and Devechi, 2016). One particularly valuable social element that Play Streets bring together through community is the exploration other people's viewpoints (Children's Commissioner, 2018). When a street becomes closed, neighbours

have the opportunity to integrate and create social connections with members of potentially varying cultures. Subsequently, through unstructured play, Hart (2002) explained that children may transfer cultural values and tendencies through games, song and dance to children with different upbringings. This type of cultural exposure may also contribute towards social development through problem solving. As children come together, they must learn to compromise and cooperate in order to decide the type of game to play, who should be involved, when to begin and end and what are the rules (Burdette and Whitaker, 2005). Through these social interactions, young people will discover how to behave when acting as either a leader or team member, both skills required to develop emotional intelligence.

Cognitive capabilities

Sport Australia (2019) describes the cognitive domain of the physical literacy as developing a person's understanding of how, when, and why to move. This includes understanding rules, concepts of a game and developing and applying tactics and strategies, knowing when and how to move in a way or perform a skill and possessing an understanding of the benefits of taking part in regular physical activity.

Cognitive function is also another feature that is enhanced in children through play. Within Play Streets' unstructured activities there are opportunities for young children to improve their thinking processes, whether that be interpreting, reasoning or thinking strategically (Encyclopaedia on Early Childhood Development, 2019). These in turn support children to learn when to move their body in order to engage with performance-based responses. Not only does play improve memory and concentration, but it also possesses the ability to advance language skills (Children's Commissioner, 2018). Wood and Martin (2010) argued that symbolic play (play imitating real life or pretend play) has a strong link with language development. Learning how to develop language skills is critical for a child's development as it allows them to understand how to follow the rules of play, apply strategies and communicate amongst peers.



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Within Play Streets' unstructured activities there are opportunities for young children to improve their thinking processes, whether that be interpreting, reasoning or thinking strategically.

Parents and community

Since the amount of time children spend in outdoor play spaces near their home has a positive relationship on levels of physical activity, it is important that young children have a support network that promotes these types of activities (Veitch et al., 2007). Parents are often considered the 'gatekeepers' of outdoor play, and subsequently exert an enormous amount of influence upon a child's level of physical activity and literacy (Encyclopaedia on Early Childhood Development, 2019). Many parents have become increasingly concerned over outdoor play primarily due to safety issues (Lee et al., 2015). The key safety issues that parents often feel most anxious about are related to potential injuries, exposure to strangers and traffic accidents (Jayasuriya et al., 2016). By temporarily closing the street, in order to protect the safety of the children, Play Streets aim to establish an environment that supports the progression of children's physical literacy and activity in conjunction with minimising parental concerns.

Safety, setting and risk taking

A primary objective of Play Streets is to create a welcoming, inclusive and safe environment for both parents and children. Assisted initially by removing any type of traffic on the street, children have the opportunity to participate in active play amongst familiar surroundings. This may contribute towards a feeling of safety and support if an emergency was to occur (Nicholson et al., 2014). This safety is also sustained by the supervision of parents and neighbours. Although Truelove et al. (2017) suggested that the supervision of adults has a greater tendency to influence girls in becoming more involved in outdoor play, parents can act as role models, offer children resources and address any accidents throughout a Play Streets session (Hart, 2002).

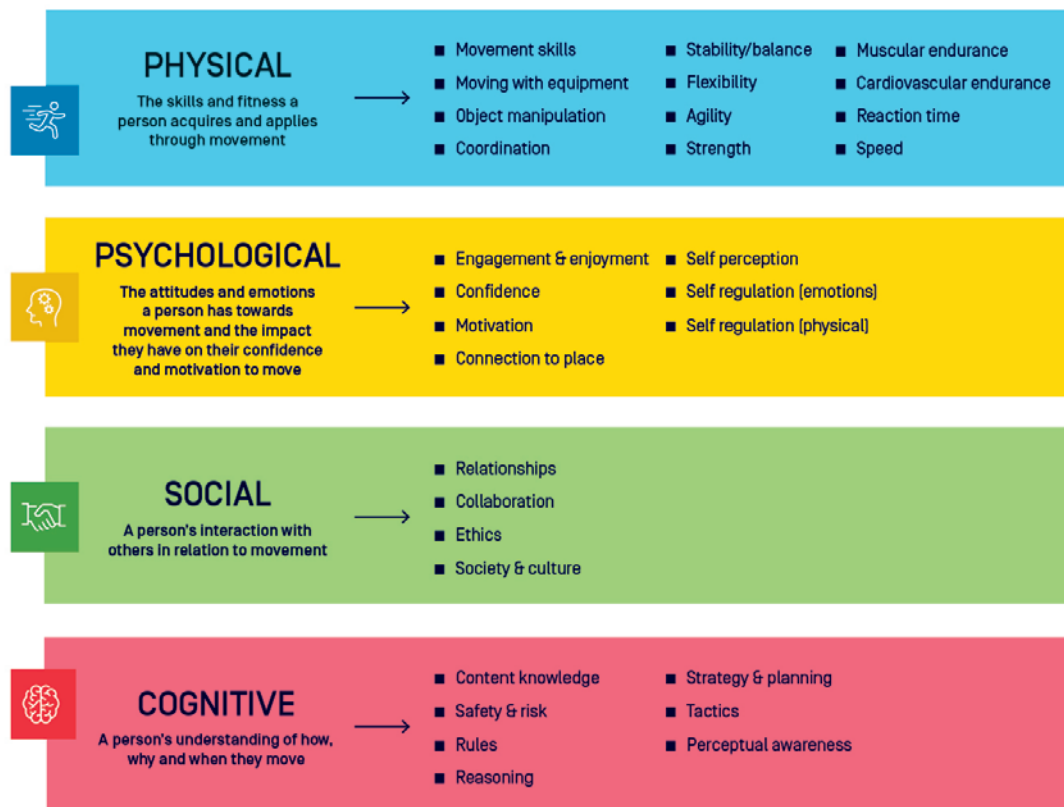
The perception of safety gives parents the peace of mind that their children can partake in riskier play activities without the concern that no one is looking out for them. This is also supported in a community sense, whereby parents may become more comfortable in allowing fellow neighbours to oversee activities. From Playing Out's (2017) survey of Play Streets in Bristol, 91% of respondents suggested they knew more people on their street and 81% explained that the street had become friendlier and safer post play street. These types of views help instil trust amongst parents. This trust has long-term positive implications upon young children's level of physical activity and physical literacy, as parents may be more inclined to allow their children to engage in outdoor play since they can trust their neighbours to assist if an emergency was to occur.

Although supervision is considered a crucial element of the Play Streets philosophy, the initiative also promotes unstructured play to develop children's levels of physical literacy and activity. Glenn et al. (2013) understand that in some respects parents have the best interests of their child/children at heart by encouraging engagement with 'healthy activities'. Not only does unstructured play target fun over a learning a skill, for example, it also encourages risk (Truelove et al., 2016). Brussoni et al. (2015) argued that risk is an important facet of child development, as those who have a lower propensity towards risk or less opportunity during outdoor play may have a greater inclination to disengage with physical activity. Therefore, Play Streets has established a structure that aligns with Brussoni et al.'s (2012:3134) strategy, "keeping children as safe as necessary, not as safe as possible".

Play Streets mapped to the Australian Physical Literacy Framework

The Framework was developed by Sport Australia in 2019 and categorises a range of movement-related skills, knowledge and behaviours into interrelated domains, elements and stages. It identifies 30 elements across four physical literacy domains – physical, psychological, social and cognitive – and provides a progression in stages for each element as shown below in Figure 1 (Sport Australia, 2019).

Figure 1: Sport Australia's components of the Australian Physical Literacy Framework (Licensed from the Australian Sports Commission under a Creative Commons Attribution 3.0 Australia Licence).




The objectives of Play Streets, to see the children and families come together with their neighbours and play, and to improve the health and wellbeing of individuals, are aligned to the physical, psychological, social and cognitive domains of the Framework. The evidence base established in the first section of this paper, shows alignment to 18 of the 30 elements, across the four domains of the Framework. When including implicit development of physical literacy, alignment increases to 20 of the 30 elements. These implicit elements are influenced by parents and community members attending Play Streets with the children and what they might offer in terms of activities or provide as equipment for children to play and how they facilitate play opportunities (i.e. adult-led, child-led). Table 1 outlines the elements that were referenced repeatedly in the literature review as outcomes of children participating in organised street play, regardless of the influence of parent and community members attending.

Analysis suggests that Play Streets is most closely aligned to the psychological and social domains of the Framework, with all elements recognised in both domains as outcomes for children participating in Play Streets. The literature revealed alignment to physical fitness in children based on the physically vigorous play and physical activity often associated with Play Streets events. Physical fitness implicitly

develops cardiovascular and muscular endurance and movement skills. There was less evidence to support outcomes for other elements within the physical domain. The focus on physical activity and cardiovascular fitness in initiatives (and their evaluations) for children are prevalent measures and often associated with current priority of funding bodies to increase physical activity levels in participants.

The evidence was aligned to the cognitive elements related to safety and risk and perceptual awareness, with others dependent on the types of activities that occurred. The mapping process did not consider the level of capability developed in elements as participants who attend Play Streets represent children, youth, adults and older adults, representing a broad range of ages and capabilities. Additionally, Sport Australia's Physical Literacy Program Alignment Guidelines (2019) advises that programs do not need to address all 30 elements of the Framework, but should aim to develop elements in each domain. The important consideration for play street initiatives is to ascertain whether the initiative's objectives for child development aligns to the physical literacy outcomes that occur, as established by the evidence base.

Table 1: Australian Physical Literacy Framework elements that Play Streets develops in children.

			
PHYSICAL	PSYCHOLOGICAL	SOCIAL	COGNITIVE
<ul style="list-style-type: none"> • Movement skills • Cardiovascular endurance • Muscular endurance • Coordination • Moving using equipment* <p>* when equipment is used</p>	<ul style="list-style-type: none"> • Engagement and enjoyment • Confidence • Motivation • Self-perception • Self-regulation (emotions) • Self regulation (physical) • Connection to place 	<ul style="list-style-type: none"> • Relationships • Collaboration • Ethics • Society and culture 	<ul style="list-style-type: none"> • Safety and Risk • Perceptual awareness • Reasoning • Strategy and planning* • Tactics* <p>* when symbolic play occurs</p>

Strengthening physical literacy in Play Streets

How and what physical literacy children develop is affected by their context, which includes individual, environmental, societal and cultural factors (Sport Australia, 2019). Play Streets and other similar models are community led, and peak bodies funding the roll out of these models are often at an arm's length of implementation. To support a consistent approach to developing and enhancing physical literacy in children through Play Streets (regardless of context and the capacities of organising community members), a set of guiding principles that promotes evidence based high quality play experiences could be useful. In acknowledging context, the principles ought to be high-level to allow for flexibility and adaptation at a local level. The principles should also be accompanied with supporting documentation and tools to help community members interpret and implement principles in a consistent way.

Based on the literature, there are several themes that could enhance physical literacy outcomes in children participating in Play Streets, which could be promoted as guiding principles and supported in their implementation.

Unstructured play

Unstructured play offers a multitude of ways to develop physical literacy across all domains of the Framework (Figure 1) and should be fostered and promoted to those running Play Streets. Unstructured outdoor play consists of open-ended play that allows freedom to construct rules, goals, and meaning (De Valk et al., 2013). With an overemphasis on adult-directed, structured activities for children nowadays, Patte's (2020) research found that children should experience twice as much unstructured time as structured play experiences. In providing play opportunities through street play, we would suggest that it may be beneficial for adults to embrace an unrestrained view and minimise/restrict over-surveillance (Encyclopaedia on Early Childhood Development, 2019). It could be important to encourage adults organising Play Streets to prioritise unstructured play, where equipment, loose parts and activities are provided for children to engage with as they desire, over organised, adult led activities.

Symbolic play

Symbolic play (play that imitates real life scenarios or pretend play) has the potential to support a large range of interrelated elements across domains of the Framework. Symbolic play and language are known to be highly interrelated (Wood and Martin, 2010) and promoting this through Play Streets can play a greater role in younger children's physical, cognitive, psychological and social development. Supporting community organisers with ideas for symbolic play in an unstructured play environment, could help to increase understanding and confidence to provide these opportunities at Play Streets events.

Developing physical fitness and movement skills

Play Streets is associated with high intensity physical activity, building physical fitness in children (Carver et al., 2008).

Although developing components of physical health are important for a child, our analysis in relation to the Australian Physical Literacy framework suggests that Play Streets should also aim towards improving a child's wider movement skills and capabilities. Due to the unstructured nature of Play Streets – who turns up, what equipment they bring and how activities are supported are varied – the development of physical skills in children can be diverse and inclusive of many-and-varied possibilities.

Development of fundamental movement skills (FMS) that encompasses balancing skills, locomotor skills such as running, jumping and hopping, and ball skills such as throwing and catching, in the early years and early primary years can generate far more long-term benefits than focusing upon building a child's current level of fitness. While FMS would implicitly be developed through physical activity at Play Streets, there is opportunity to develop it more explicitly through utilising minor games. Minor games are simple games, with few rules, that help participants to practice a skill. For example, games of tag develop running and dodging movement skills in participants. Minor games through active play can support the development of FMS within the physical domain of the Framework, as well as developing characteristics of elements across all other domains (e.g. persistence, negotiation, problem solving, planning and cooperation (Australian Curriculum and Assessment and Reporting Authority, 2020). Minor games can be structured and led by adults, or be child-led and adult supported. To develop confidence and knowledge of how to run minor games, community organisers could be supported with examples of simple, fun and inclusive minor games suited for street play.

It is important to note that minor games could be considered a form of structured play. Used sparingly, these types of activities can play an important role facilitating the bringing of neighbours together at the start of Play Streets to help break the ice and warm people up for other forms of play.

The Play Streets model could further enhance physical skill by promoting the use of equipment. The evidence suggests that when equipment such as bikes, scooters, jump-ropes and roller-skates are utilised in Play Streets, children develop their abilities to move with equipment (Playing Out, 2017). They also develop in other elements of the physical domain, for example coordination and stability and balance. To support organising community members, simple messages to encourage attendees to 'BYO' an item to play with others could be considered (e.g. bike, balls, scooters, hula hoops, totem tennis, etc.).

Conclusion

Play Streets supports the development of physical literacy in children holistically, with a particular strength in developing psychological and social capabilities in children. Play Streets increases children's physical fitness, but there was less evidence to show outcomes in physical skill development. To enhance physical literacy outcomes so that children develop the skills to build and maintain their ability to be active as they become older, a focus on supporting parents and community organisers who run play streets could be considered through guiding principles. These principles could help to consistently promote the evidence-based approaches that best develop physical literacy in children through play, such as unstructured play, symbolic play and a focus on developing fundamental movement skills.



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