

# Exploring the feasibility of implementing a pedometer-based physical activity program in primary school settings: a case study of 10,000 steps

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## Introduction

Regular physical activity is important to the future health of children. Physical activity helps to improve metabolic health and prevents the onset of cardiovascular risk factors.<sup>1-3</sup> Research suggests that physical inactivity and increased metabolic risk in childhood continues through to adulthood.<sup>4-6</sup> Developing and implementing interventions to increase physical activity in children is essential for the health of future generations of Australians.<sup>7,8</sup> Despite the well-publicised physical activity guidelines for Australian children, data indicate that 68% of children aged 9-16 do not meet these guidelines.<sup>9</sup>

The 10,000 Steps program is a publicly available Australian health promotion program that promotes physical activity by self-monitoring daily steps taken using a pedometer.<sup>10,11</sup> It also disseminates physical activity information, materials, resources and support via an interactive website ([www.10000steps.org.au](http://www.10000steps.org.au)). The 10,000 Steps program was developed to target the adult population, but receives an increasing number of requests from primary schools to implement the current 10,000 Steps resources in the school setting. However, the appropriateness or suitability of the 10,000 Steps materials for student populations has not been evaluated. This study aimed to explore the feasibility and appropriateness of the 10,000 Steps program resources in the primary school environment.

## Methods

This study involved the implementation of a 10,000 Steps pilot study in three primary schools in Rockhampton, Australia. Each school was asked to implement the 10,000 Steps program in three classes from year four to seven during Term 3 of the 2010 school year, and subsequently participate in a qualitative evaluation. Each school was allowed to autonomously decide how they wanted to implement the 10,000 Steps program and which resources from the 10,000 Steps website they would use. Schools were also provided ninety 10,000 Steps branded pedometers (Yamax Digiwalker SW-200) to assist with implementation. After the completion of the pilot study (at the end of Term 3 and the beginning of Term 4), one small group semi-structured interview with teachers and one focus group with students were conducted (and audio-taped) at each of the three schools. This allowed for an in-depth discussion to evaluate the 10,000 Steps program and resources. All teachers involved in the implementation of the pilot study were asked to participate in semi-structured interviews and to nominate students in their classes to contribute to the focus groups. Ethical approval was provided by the Human Research Ethics Committee at CQUniversity. Informed consent was obtained from teachers and parental consent was obtained for students.

Interviews and focus groups were professionally transcribed verbatim, coded and combined with two researchers (CD, SH) separately

## Abstract

**Issues Addressed:** The school environment provides an ideal setting for physical activity programs. The aim of the current research was to explore the feasibility and appropriateness of implementing program resources from an adult pedometer-based physical activity program (10,000 Steps) into the primary school environment.

**Methods:** 10,000 Steps resources were implemented in three primary schools as a pilot study. Qualitative evaluation of the pilot study included semi-structured interviews with teachers and focus groups with students.

**Results:** Four major themes were identified regarding implementation enablers: pedometers; curriculum inclusion; 10,000 Steps challenges and resources; and motivation and enthusiasm.

**Conclusions:** To achieve a suitable and successful implementation, the 10,000 Steps program and resources need to be adapted for school settings so as to optimise teacher load and curriculum inclusion, and enhance adaptability or flexibility of programs and resources.

**Key words:** physical activity, schools, children, qualitative methods and quantitative methods.

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## So what?

To fully utilise the power of the school environment to implement existing physical activity programs, programs need to place minimal demands on schools and teachers. This can be achieved by developing programs and resources that can be implemented into the existing curriculum and have the flexibility to be easily adapted to suit different age groups and individual school needs.

identifying themes. Any discrepancies between coding were resolved through discussion between coders to produce the final themes and coding structure. Data analysis was conducted using QSR NVivo software.

## Results

### Pilot Study

The three schools chose to implement and use the 10,000 Steps program and resources in different ways (Table 1). The three teacher semi-structured interviews consisted of a total of three male and five female participants with ages ranging between 18 and 55 years. The three student focus groups consisted of seven boys and 11 girls with an age range of 10 to 12 years. There were two to three participants in semi-structured interviews; focus groups numbers ranged from six to eight. Four main themes emerged from the thematic analysis: pedometers; curriculum; 10,000 Steps challenges and resources; and motivation and enthusiasm. An overview of key points and quotes resulting from thematic analysis is provided in Table 2. Briefly, thematic analysis identified that pedometers were the most discussed topic, and received both positive and negative comments. Teachers and students identified pedometers as one of the main motivators of involvement in physical activity, but also reported that students falsely accumulating steps was a regular occurrence. Additionally, problems with the distribution and tracking of pedometers were identified as key issues to resolve in broader dissemination of the program. Inclusion within the curriculum was identified by teachers as a method to promote greater integration of the program in the school day and also allow teachers to dedicate sufficient time to running the program. Related to the implementation of the program, teachers identified that the 10,000 Steps challenges and resources need to be simplified. This also linked in with comments relating to "motivation and enthusiasm"; both teachers and students indicated that the ideal duration for future 10,000 Steps programs should be no more than one term, potentially with smaller challenges as part of the larger term-long challenge. Results highlight that students and teachers are interested in a curriculum-based 10,000 Steps program and are particularly motivated by the use of pedometers throughout the program. However, attention needs to be directed toward maintaining motivation throughout the program and ensuring that the use of pedometers are not abused through falsely accumulating physical activity in the form of steps.

### Discussion

As children spend a large portion of their time in the school environment this is an ideal setting to increase physical activity

behaviour. The results of the current study provide further support for the use of pedometer-based physical activity programs in a primary school setting. However, the findings also highlight the difficulties in implementing physical activity programs in these settings and identify a number of areas that need to be addressed to increase program effectiveness and enable widespread implementation of physical activity resources in this setting.

One of the main considerations is to develop sustainable physical activity resources and programs that can be incorporated into the existing curriculum.<sup>12</sup> Integration of the 10,000 Steps concept with curriculum is a potential method to reduce the burden on teachers when it comes to implementing physical activity programs.<sup>13,14</sup> Removing this barrier could encourage increased uptake of physical activity programs in schools and enable teachers sufficient time to implement the program and encourage physical activity in children. Previous studies have suggested that such integration is viable<sup>12,13,15</sup> and can lead to an increase in children's physical activity.<sup>15,16</sup>

The 10,000 Steps program appears to be feasible and, with some adjustments, suitable for implementation in primary schools. If the program was confined to a school setting only, a variation on the program's slogan would be needed, for example: "Did you get your 10,000 Steps at school today?". If the program was not be confined to a school setting, the goal of reaching 10,000 Steps will need adjusting as the children reported greatly exceeding 10,000 Steps when they were allowed to continue to wear their pedometers outside school hours. This recommendation is further supported by recent research based on the BMI cut point for Australian children aged 7-16 years that recommends the accumulation of 16,000 steps per day for both boys and girls.<sup>17</sup> Keeping pedometers restricted to the school environment provides cost benefits for schools as they could purchase pedometers and use them to implement multiple programs across the school year to different classes. The issue of cheating also needs to be addressed. The students naturally wanted to compete with their peers in relation to step counts, which led some to cheat. Perhaps when considering the development of programs for primary schools, the emphasis on competition with others needs to be minimised and the focus placed on competing with oneself.

Despite applying a relatively small convenience sample, a number of recommendations can be made for the successful implementation of similar pedometer-based physical activity programs in primary schools. These are:

- ensure high teacher involvement;
- ensure curriculum integration across a number of core subjects;
- use an appropriate project slogan for students;

**Table 1: Overview of Pilot Study implemented in schools.**

School	Length	Years	Age Range	Pedometer Use	Included in Curriculum	Challenge Used	Resources Used
School one	5 weeks	4	8-9 years	In school only	Yes	Nil, created own	Pedometer safety strap
School two	7 weeks	5, 6 & 7	9-13 years	In school only	No	Queenslander Challenge	Queenslander map, pedometer safety strap
School three	5 weeks	6 & 7	10-13 years	In and outside of school	No	Queenslander Challenge	Queenslander map, pedometer safety strap

*Note: The Queenslander challenge is one of the 10,000 Steps Challenge resources, which is a tour around the state of Queensland. Beginning in Rockhampton, the challenge reaches Sunshine Coast, Cunnamulla, Birdsville, Mt Isa, Normanton, Cape York, Cairns and Mackay before finishing in Rockhampton. The challenge is a total of 7,465km or 9.3 million steps.*

- use colourful pedometers;
- adhere to a short program duration (perhaps with yearly repetition);
- set appropriate step goals for school-based only and whole day programs;
- develop different versions of the same resources to accommodate age differences and school diversity; and
- develop protocols to monitor resources such as pedometers.

### Conclusions

This study highlights that while current 10,000 Steps resources could be feasible in a primary school environment the resources need tailoring to the needs of this setting. This may include inclusion into the curriculum and development of an easy pedometer tracking system to reduce the burden of implementation on teachers and schools.

**Table 2: Key outcomes Interviews and Focus Groups with Teachers and Students.**

Theme	Participants	Key Points	Key Quotes
<b>Pedometers</b>	Teachers	<ul style="list-style-type: none"> <li>• Pedometers were identified as one of the main highlights.</li> <li>• Pedometers increased student motivation to participate in the program and track steps.</li> <li>• Distribution and tracking of the pedometers presented a challenge.</li> <li>• Falsely accumulating steps (cheating) prevalent.</li> <li>• Issues with students forgetting and losing pedometers when they were allowed to take them home.</li> <li>• Strategies were developed to overcome the above problem (i.e. engraved pedometers and assigned specific pedometers to students).</li> </ul>	<p>'They [students] came in early in the morning and collected them. Then away they went before the bell rang. So they get up a couple of thousand steps before they got back in the morning' [F, S1].</p> <p>'They loved checking it [the pedometer] and they love competing. I just wish there was a way that you could make them not cheat' [M, S1].</p>
	Students	<ul style="list-style-type: none"> <li>• Issue of cheating was the most often raised topic.</li> <li>• Pedometer improvements suggested such as creating themed, coloured or talking pedometers.</li> <li>• Students from the school that were allowed to take the pedometer home reported greatly exceeding 10,000 Steps.</li> </ul>	
<b>Curriculum</b>	Teachers	<ul style="list-style-type: none"> <li>• 10,000 Steps program need to be included into the curriculum in order to be sustainable.</li> <li>• Lack of time reported to be a major barrier for program delivery.</li> <li>• Subject areas identified for curriculum inclusion were: mathematics, Study of Society Environment (SOSE), computers/technology, science, and health and physical education.</li> <li>• Age need to be considered when planning curriculum activities so that they are meaningful to students.</li> </ul>	<p>'There are units that we could quite easily fit it (the 10,000 Steps program) in..... which from a teacher's point of view, (would make it) easier to manage' [F, S2].</p>
	Students	<ul style="list-style-type: none"> <li>• Curriculum was not addressed in student focus groups.</li> </ul>	
<b>10,000 Steps Challenges and Resources</b>	Teachers	<ul style="list-style-type: none"> <li>• Map-based challenges were not specific enough for students.</li> <li>• Teachers stopped using map-based resources during the program's duration as student became bored with the challenge after forgetting to wear pedometers.</li> <li>• Teachers commented that students were confused about how to use the maps and require a more simplistic version.</li> <li>• One school created its own challenges and used computer programs to record steps and encouraged students to develop weekly graphs. This was included in the curriculum.</li> </ul>	<p>'They didn't go right the way around because some of the kids forgot to put their pedometers on...' [F, S2].</p>
	Students	<ul style="list-style-type: none"> <li>• Liked the team and competition aspects of the challenges and learning about Queensland geography through the maps.</li> <li>• Expressed interest in using 10,000 Steps website to record steps.</li> <li>• Suggested classroom celebrations upon completion of challenges.</li> <li>• Liked the idea of smaller (shorter duration) challenges.</li> </ul>	
<b>Motivation and Enthusiasm</b>	Teachers	<ul style="list-style-type: none"> <li>• Schools which had shorter program duration maintained student enthusiasm.</li> <li>• The school which included curriculum integration indicated the highest level of motivation and enthusiasm.</li> <li>• Decreases in motivation due to age of students and not being able to complete the 10,000 Steps challenges.</li> <li>• Challenges need to be specific and achievable for students.</li> <li>• Ideal duration for programs should be no more than one term.</li> <li>• The competition aspect was identified as one of the main motivators.</li> </ul>	<p>'I think the kids were really enthusiastic about it – like it definitely got them moving more...' [F, S2].</p> <p>'Competition always works well, especially seeing it's obtainable. Especially since it's just walking' [M, S1].</p>
	Students	<ul style="list-style-type: none"> <li>• The largest decline in student enthusiasm was in the school that included the program for the whole semester.</li> <li>• The teachers from this school were also the least involved in encouraging student participation.</li> <li>• Students commented they were bored with the program at times, but not too much.</li> <li>• Most students reported the program encouraged them to be more active.</li> </ul>	<p>'My teacher doesn't like them..... he says it's too much effort...' [F, S3] and '[the student] has got the teachers [pedometer] on for her...' [F, S3].</p>

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