Process Evaluation of a Scaled-Up School-Based Physical Activity Program for Adolescents: Physical Activity 4 Everyone

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Background: Physical Activity 4 Everyone (PA4E1) is a whole-school physical activity program, with demonstrated efficacy (2012–2014). PA4E1 was adapted (scaled-up) and tested in a scale-up trial (2017–2020). This process evaluation study of the scale-up trial had 2 aims. First, to describe the acceptability, appropriateness, and feasibility of PA4E1 in the scale-up trial, from the perspective of school staff involved in the program management and delivery. Second, to generate themes that may explain school staff assessments of acceptability, appropriateness, and feasibility.

Methods: Data were collected at various time points throughout the 2-year implementation phase. Online surveys were collected from In-School Champions, Head Physical Education teachers, Principals, and Physical Education teachers (quantitative data). Focus groups and interviews were conducted with In-School Champions, Principals, and Physical Education teachers (qualitative data). Existing published data on website engagement, adaptations, modifications, and the scale-up trial primary outcome (implementation of physical activity practices) were triangulated with the quantitative and qualitative during analysis, to generate themes.

Results: School staff delivering PA4E1 reported it was highly acceptable, appropriate, and feasible. Seven themes were generated relating to acceptability, appropriateness, and feasibility. The themes related to how the program was funded, the delivery modes of implementation support, the identification of easy-wins, the recruitment of the right in-school champion, facilitating principal buy-in, mitigating the impact of school staff turnover, and engaging the whole school.

Conclusions: Recommendations are made to inform future adaptations for PA4E1 and potentially school-based physical activity programs more generally. The findings may inform future scalability assessments of the suitability of programs for scale-up.

Keywords: acceptability, appropriateness, feasibility, scalability, mixed methods, intervention
To address the gap of comprehensive process evaluations of school-based PA programs,10,19–22 and to assist in the interpretation of trial findings and scalability of the program, we conducted a mixed-methods process evaluation of Physical Activity 4 Everyone (PA4E1). In line with our published process evaluation protocol,26 the study had 2 aims. First, to describe the acceptability, appropriateness, and feasibility of PA4E1 in the scale-up trial, from the perspective of school staff involved in the program delivery in schools: In-School Champions (key program delivery agent), Head Physical Education (PE) teachers, Principals, and PE teachers. Second, to generate themes that may explain school staff assessments of acceptability, appropriateness, and feasibility.

Physical Activity 4 Everyone

PA4E1 is a whole-school secondary school PA program, first trialed in 2012–2014.27–31 The efficacy trial in 2012 involved 10 schools (5 program arm) and found a positive change in moderate-to-vigorous-intensity PA between groups of 49 minutes a week (95% CI = 2.7, 11.4, P < .002),27,29 improved adolescent weight status (P < .01), and it was found to be cost-effective.28 A scale-up trial of an adapted32 PA4E1 in more schools was then conducted in 2017,26,32–36 upon which this process evaluation is focused.

The PA4E1 scale-up trial utilized a type III hybrid implementation-effectiveness randomized controlled trial design.37 Evaluation methods were reported in a trial protocol33 and a process evaluation protocol.26 Briefly, the scale-up trial (2017–2019) evaluated the adapted PA4E1 program in a larger number of low-socioeconomic secondary schools (n = 49, 24 program arm schools) across a larger geographic area of New South Wales, Australia.

PA4E1 consists of 7 evidence-based PA practices and a set of 7 implementation support strategies which had been purposely adapted32 for scale-up and designed to assist schools to overcome barriers to implementing the PA practices. The PA4E1 PA practices and implementation support strategies are outlined in Figure 1. Complete descriptions of the PA4E1 PA practices and implementation support strategies can be found in Supplementary Material S1 (available online). Schools in the program arm were provided implementation support over 24 months (8 school terms).

Scale-up trial primary outcome results found that at 24 months, significantly more schools in the program group (16/23, 69.6%) implemented at least 4 of the 7 PA practices than the control group (0/25, 0%; P < .001). For 6 of the 7 practices, program schools were significantly more likely to be implementing them than control schools (all practices except links with community PA providers).35

At a school level, the key implementation personnel were an In-School Champion, a Head PE teacher (these teachers sometimes assumed the In-School Champion role), PE teachers, and Principals (executive support). A key implementation support strategy was the appointment of an existing PE teacher in the school (by the
Principal) to take the role of the In-School Champion for PA4E1 (in 13/24 schools this was the Head PE teacher). Half a day per week was allocated to support implementation, with funding provided to schools to enable relief from usual school duties. Four government local health districts (Hunter New England, Central Coast, Mid-North Coast, and South-West Sydney Local Health Districts) were involved in supporting the implementation of the scaled-up PA4E1 program to schools in their regions, as a research-practice partnership with the University of Newcastle and the NSW Department of Education. Each local health district employed a Health Promotion Officer in the role of External Support Officer. They supported a number of In-School Champions in their region to implement PA4E1. A dedicated PA4E1 program website delivered the remaining implementation support strategies electronically including housing teacher professional learning, program resources, prompts, and reminders, and delivered audit and feedback reports. This delivery model is outlined in Figure 2.

Methods

This research has been conducted and reported in accordance with the requirements of the Standards for Reporting Implementation Studies Statement (Supplementary Material S2 [available online]) and the Standards for Reporting Qualitative Research (Supplementary Material S3 [available online]). Full details of the schools involved in this trial have been published elsewhere. Briefly, of the 24 schools receiving the PA4E1 program, and thus involved in this process evaluation, 19 were government schools and 5 were catholic schools. Twelve schools had >10% indigenous student enrollment. Eleven schools were in major cities, 9 in inner regional and 4 in outer regional areas.

Overview of Data Sources

For this study, we draw on data from the program (intervention) arm of the scale-up trial. Data sources are outlined in Table 1.

Table 1 Schedule of Data Collection Methods (SPIRIT Figure)

<table>
<thead>
<tr>
<th>Study measure</th>
<th>Timepoint</th>
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<tbody>
<tr>
<td></td>
<td>12 mo</td>
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<tr>
<td>Quantitative</td>
<td></td>
</tr>
<tr>
<td>Head physical education teacher telephone interview survey</td>
<td>—</td>
</tr>
<tr>
<td>Physical education teacher online survey</td>
<td>—</td>
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<tr>
<td>In-School Champion online survey</td>
<td>—</td>
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<tr>
<td>Qualitative</td>
<td></td>
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<tr>
<td>Focus groups with In-School Champions</td>
<td>X</td>
</tr>
<tr>
<td>Semistructured interviews with physical education teachers</td>
<td>—</td>
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<tr>
<td>Semistructured interviews with Principals</td>
<td>—</td>
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<tr>
<td>Published data</td>
<td></td>
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<tr>
<td>Website engagement</td>
<td>↔</td>
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<tr>
<td>Adaptations and modifications</td>
<td>↔</td>
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<tr>
<td>Implementation outcome (trial primary outcome—baseline, 12 and 24 mo) and fidelity and reach of implementation support strategies (12 and 24 mo)</td>
<td>X</td>
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</table>

Figure 2 — PA4E1 delivery model showing the main decision makers, the In-School Champion as the day-to-day operational management, and the PE teachers and In-School Champion as delivering the program. PA4E1 indicates Physical Activity 4 Everyone; PE, physical education.
Quantitative Data

Head PE Teacher Survey. At the end of the implementation support period (24 mo), computer-assisted telephone interview surveys were administered by trained interviewers to Head PE teachers. This survey measured acceptability, appropriateness, and feasibility of the PA4E1 program overall at 24 months using three 4-item valid and reliable scales developed by Weiner et al., on a 5-point Likert scale from “strongly disagree” to “strongly agree”: the Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and the Feasibility of Intervention Measure (FIM).

PE Teacher Survey. All PE teachers (n = 184) were emailed and asked to complete an online survey at 24 months. This survey collected data from the perspective of PE teachers regarding acceptability, appropriateness, and feasibility of the PA4E1 program overall, using the AIM, IAM, and FIM tools. In-School Champions were asked by their Support Officers to encourage and prompt PE teachers to complete these surveys.

In-School Champion Survey. All In-School Champions (n = 24) were asked by email to complete an online survey at 24 months. This survey asked about the acceptability, appropriateness, and feasibility of each of the 7 PA practices and each of the 7 implementation support strategies within PA4E1, using reduced item adapted versions of the AIM, IAM, and FIM tools. For In-School Champions, results will be reported separately for practices and implementation support strategies. In line with the published protocol, single items from the AIM, IAM, and FIM were repeated for each of the 7 PA practices and 7 implementation support strategies: AIM: “I like it,” IAM: “I think it’s suitable for our school,” and FIM: “I think it’s doable for our school.” In-School Champions were prompted by their External Support Officer to complete the survey.

Qualitative Data

Focus Groups | In-School Champions. Interactive face-to-face focus groups with In-School Champions were conducted at midpoint, after 12 months of implementation support. In-School Champions from all 24 schools were invited to participate. To ensure high participation rates, 2 focus groups were organized on the same day, and at the same venue, at an implementation training workshop for In-School Champions. The third focus group was held closer to rural schools. In-School Champions were asked broad questions relating to the program (both PA practices and implementation support strategies) using a semistructured guide (see Supplementary Material S5 [available online]). While a question guide was used, participants were encouraged to discuss additional issues as relevant. Interviews were conducted at the end of the first year of implementation support, between October and November 2019.

Semistructured Interviews | PE Teachers. A purposeful subsample of PE teachers (n = 18 PE teachers, 3 per school, n = 6 schools) were invited to take part in interviews conducted face-to-face at their respective schools. Schools were invited based on their implementation outcome score, both high implementers (n = 9) and low implementers (n = 9) were invited. Low and high implementers were categorized using PA practice implementation data obtained from In-School Champions through the program website after 12 months of implementation support. Schools were sampled from across all 4 local health districts involved in the program. To ensure high participation rates (100% of invited were recruited), recruitment to interviews was through contact between In-School Champions and Support Officers. Interviews were semi-structured, using a flexible interview guide (see Supplementary Material S5 [available online]). Interviews were conducted at the end of the second year of implementation support, between October and November 2019.

Semistructured Interviews | Principals. A purposeful subsample of Principals (n = 12) from high- and low-implementing schools were invited to take part in interviews conducted face-to-face at their respective schools (based on the same purposeful strategy as PE teacher interviews). Schools were sampled across all 4 local health districts involved in the program. Recruitment to interviews was through contact between In-School Champions and Support Officers. Interviews were semi-structured, using a flexible interview guide (see Supplementary Material S6 [available online]). Interviews were conducted at the end of the second year of implementation support, between November and December 2019.

PA4E1 Published Data

Previously published data on website engagement, adaptations and modifications, implementation support strategy fidelity and reach, and the trial’s primary outcome (practice implementation) were also included in the analysis. Briefly, the website engagement data included themes from a mixed-methods evaluation of the PA4E1 website. Adapta
tions and modifications data tracked adaptations throughout the 24 months, highlighting where changes were made, both planned (adaptations) and unplanned (modifications). Implementation support strategy fidelity (ie, support provided to schools) and reach (ie, support uptake by schools) scores were calculated based on project administration and website data collected throughout the 24-month program. Finally, the primary trial outcomes (practice implementation) were as Head PE teacher reported PA practice uptake, dichotomized to implementing or not implementing 4 of the 7 practices in the current school year, as well as implementation of each of the 7 practices (a secondary outcome).

Data Analysis

Aim 1: Acceptability, Appropriateness, and Feasibility

Survey data were analyzed using SAS, version 9.3, from February to April 2020, producing descriptive statistics. Analysis of AIM, IAM, and FIM was guided by the scoring guidance provided by Weiner et al. Given the absence of cut-points for the AIM, IAM, and FIM tools, using an AIM, IAM, and FIM scoring system similar to another study, scores (out of 5) on these tools of <3.5 were deemed poor, ≥3.5 to 4 were deemed moderate, and scores of >4 were deemed high acceptability, appropriateness, and feasibility.

Aim 2: Themes

All interviews and focus groups were carried out by the same researcher (Mclaughlin), under the guidance of a mixed methods researcher (Duff). All focus group and interviews were audio-recorded and transcribed verbatim. The transcripts were checked for accuracy by Mclaughlin, with corrections made as appropriate. Identifiable comments were anonymized prior to importing into Nvivo V12 (QSR, Lumivero). All qualitative data were thematically analyzed using QSRNVivo by the lead researcher.
Mclaughlin using a common 6-step methodology. A reflexive approach was taken to thematic analysis, involving Mclaughlin familiarizing with the data, then coding inductively. Mclaughlin kept a reflexivity journal throughout the qualitative data collection and mixed-methods analysis process, to reflect upon how their values and views may influence the interpretation and meaning of the data. The initial codes were discussed between Mclaughlin and Duff.

**Triangulation.** Qualitative, quantitative, and published data-sets were triangulated during analysis, with all data strands being given equal emphasis as they all address the aims equally. An approach called “following-a-thread” was used, whereby initial codes that arise in 1 data set were further explored, or explained, with another. A diagram of the process evaluation analytical procedure is provided in Figure 3. The triangulation protocol is also described in more detail in the process evaluation protocol. Briefly, the triangulation protocol involved displaying the findings generated from each component of the study on the same page. This matrix of findings explored convergence, discrepancy, or dissonance (level of agreement between different data sets). Using this following-a-thread approach to triangulation, Mclaughlin revised the initial qualitative coding. Mclaughlin and Duff then discussed the revised codes, prior to Mclaughlin refining codes further and forming initial themes. Finally, these initial themes were then discussed between all authors, refined, and finalized.

**Positionality.** To increase trust and transparency in this research, the authors provide here their context, professional backgrounds, and worldview. The research was conducted using a pragmatist epistemology—where knowledge is always based on experience, where each person’s knowledge is unique and is constructed by their unique experiences. Authors in this review have expertise in qualitative, quantitative, and mixed-methods research methods, implementation science, government embedded research, process evaluations, and PA.

**Ethical Approval**

Ethical approval was received from Hunter New England Human Research Ethics Committee (Ref No. 11/03/16/4.05), University of Newcastle (Ref No. H-2011-0210), NSW Department of Education and Communities (SERAP 2011111), Maitland Newcastle Catholic School Diocese, Broken Bay Catholic School Diocese, Lismore Catholic School Diocese, Armidale Catholic School Diocese, and the Aboriginal Health and Medical Research Council. The trial was registered with the Australia and New Zealand Clinical Trials Registry ACTRN12617000681358. Informed consent was obtained from all participants.

**Results**

**Participant Demographics**

Table 2 outlines the demographic characteristics for each data collection tool. Nineteen In-School Champions took part in 3 focus groups, with an average length of 57 minutes. In total, across 12 schools, there were 18 interviews with PE teachers (average...
length = 27 min) and 11 interviews with Principals (average length 24 min). These schools represented half of total program schools.

**Aim 1: Acceptability, Appropriateness, and Feasibility**

The AIM, IAM, and FIM results are reported in Table 3. The scores (>4) indicate that, in general, In-School Champions, Head PE teachers, and PE teachers found PA4E1 highly acceptable, appropriate, and feasible. Compared with PE teachers, Head PE teachers had higher scores across AIM, IAM, and FIM. For In-School Champions, both practices and implementation strategies scored highly, with practices tending to score slightly higher.

**Aim 2: Themes**

Analysis generated 7 themes relating to the acceptability, appropriateness, and feasibility of the program from the perspective of school staff.

**Theme 1: The Concept, Amount, Length, and Utility of Funding—All Important for Principals’ Decision to Adopt the Program**

A key implementation support strategy (substrategy 2.2) was to fund the In-School Champion for half a day per week (equivalent to $350AUD a fortnight). The intention of this implementation strategy was to release the In-School Champion from their

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Participant Demographics and Characteristics</th>
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<tbody>
<tr>
<td>Head PE teacher survey (N = 23)</td>
<td>Gender (number [%]) Female = 11 (47.8%)</td>
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<tr>
<td></td>
<td>Years teaching experience (mean [SD]) 14.3 (6.9)</td>
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<tr>
<td></td>
<td>Number of full-time equivalent PE teachers in their school (mean [SD]) 6.3 (2.5)</td>
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<tr>
<td>PE teacher survey (N = 45)</td>
<td>Gender (number [%]) Female = 25 (55.6%)</td>
</tr>
<tr>
<td></td>
<td>Years teaching experience (mean [SD]) 13.8 (5.8)</td>
</tr>
<tr>
<td>In-School Champion survey (N = 20)</td>
<td>Teachers in the role of In-School Champion during 2-y program (mean [SD]) 1.6 (1.2)</td>
</tr>
<tr>
<td></td>
<td>Total PE teachers that joined the PE faculty during the program (mean [SD]) 3.1 (2.4)</td>
</tr>
<tr>
<td></td>
<td>Schools with a change of principal since start of the program (n [%]) 8 (40)</td>
</tr>
<tr>
<td>In-School Champion focus groups (n = 19; 79%)</td>
<td>N focus groups 3</td>
</tr>
<tr>
<td></td>
<td>Mean length, min 57</td>
</tr>
<tr>
<td>PE teacher interviews (n = 18)</td>
<td>N participants low-implementing schoolsa 12</td>
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<td></td>
<td>N participants high-implementing schoolsa 6</td>
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<td></td>
<td>Mean length, min 27</td>
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<tr>
<td>Principal interviews (n = 11)</td>
<td>N participants low-implementing schoolsa 5</td>
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<td></td>
<td>N participants high-implementing schoolsa 6</td>
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<td></td>
<td>Mean length, min 24</td>
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Abbreviations: PE, physical education.

aLow- and high-implementing schools were defined as meeting the primary outcome (high) or not meeting the primary outcome (low) at 12 months. The primary outcome was implementing at least 4 of the 7 physical activity practices.

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Results of the AIM, IAM, and FIM Measures of Acceptability, Appropriateness, and Feasibility</th>
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<tbody>
<tr>
<td>Head PE teacher (mean [SD])</td>
<td>N = 23</td>
</tr>
<tr>
<td>PE teachers (mean [SD])</td>
<td>N = 45</td>
</tr>
<tr>
<td>In-School Champion practicesb (mean [SD])</td>
<td>N = 20</td>
</tr>
<tr>
<td>In-School Champion implementation support strategiesb (mean [SD])</td>
<td>N = 20</td>
</tr>
<tr>
<td>AIMb</td>
<td>4.54 (0.53)</td>
</tr>
<tr>
<td>IAMb</td>
<td>4.36 (0.69)</td>
</tr>
<tr>
<td>FIMb</td>
<td>4.26 (0.55)</td>
</tr>
</tbody>
</table>

Abbreviations: AIM, Acceptability of Intervention Measure; IAM, Intervention Appropriateness Measure; FIM, Feasibility of Intervention Measure.

bScores out of 5, with 5 indicating best possible score. bScores calculated as a mean of individual scores for each physical activity practice and implementation support strategy, respectively. Scores <3.5 were deemed poor, 3.5–4 were deemed moderate, and scores of >4 were deemed high acceptability, appropriateness and feasibility.39
teaching load—to allow them time to co-ordinate PA4E1 implementation, and have the program embedded within the school context. The funding was paid to schools as a yearly lump sum, equivalent to approximately AUD $7000 (USD $4600). Fidelity and reach data suggest that 100% of the funding was provided to, and received by, schools.

Principals unanimously highlighted that this funding was important (acceptable and appropriate) for their decision to get involved with the program, but that the funding amount (approx. equivalent to 0.1 full-time equivalent teacher) was not considered to be a large amount in a school context.

You probably still need a bit of that sweetener, to get it across a principal’s desk, because they’d get a gazillion things come in. (Principal, School 1)

... in the scheme of things, the funding for the School Champion isn’t a huge amount of money. (Principal, School 2)

PA4E1 was proposed as 2 years of implementation support during recruitment. Principals suggested that 2 years of funding, program longevity, and sustainability were front of mind when making the decision to initially engage with the program.

If they had come along and offered me this money for [only] six months, I would say “no—take your money and give it to somebody else.” I think there’s a lot of other Principals like me that say, “Right, if you’re gonna do something, let’s do it for an extended period of time.” (Principal, School 5)

In terms of maintenance of the program, there were contrasting views among Principals regarding the role of funding. Some schools reported needing the funding more than others, citing competing demands on available funding and teaching loads. By contrast, other Principals highlighted that they had discretionary funds available that they could use to fund the program.

We can only divide our pie so many times. It would be another division that we would have ... . (Principal, School 4)

I think that if the program is gonna have real benefit, I’ll put money to it, and we have quite significant funding in our budget now. (Principal, School 1)

In-School Champions thought that the funding was a key success factor and important to sustain PA4E1 and justify the importance of PA4E1 with their Principals and the broader school community.

As PE teachers, we’re always throwing our hands up. To take school camps, trips away etcetera. So I think one of the key successes is the [funding] allowance for release. (In-School Champion, Focus Group 2)

I think the support [the funding] is valuable. It adds credence and value to the program in people’s eyes. (In-School Champion, Focus Group 3)

Principals also reflected that the funding was important to maintain the profile of the program within the school.

If you don’t have, if you don’t have skin in the game, so to speak, it’s probably just going to become another one of those programs that just, doesn’t go anywhere. (Principal, School 3)

The funding was used by schools in divergent ways. Some Principals suggested using the funding as intended (ie, to release In-School Champion from teaching load). Some schools released the In-School Champion for timetabled periods across the week. Other Principals allowed In-School Champions to take a day off from teaching each fortnight, or as required, to work on PA4E1 implementation. However, for other Principals, they found it difficult to use the funding to release the In-School Champion from their teaching load, citing challenges finding lesson cover due to the unavailability of casual teachers. Accountability of funding use was also raised by some Principals, as a funding acquittal was not requested from schools.

The release is a little problematic in itself, because whilst you can release someone to do the role, you’ve then got to find somebody else to pick up the slack. So, mathematically, it works great ... but making that work in a school can be problematic. (Principal, School 2)

This year we built the relief into her [in-School Champion] timetable, but the last couple of years, it’s been impossible for us to actually get casual teachers to actually come in to remove her from classes. There was just no casual teachers, particularly no PE casual teachers ... . (Principal, School 6)

Overall, the 2-year funding was highly acceptable, securing the buy-in of Principals and recruiting schools. However, schools found it challenging and sometimes unfeasible to use the funding as intended to release the In-School Champion.

**Theme 2: Multiple Delivery Modes of Implementation Support Perceived to Be Important and Complementary, Rather Than a Single Delivery Mode**

Two face-to-face workshops for In-School Champions were held, 1 at program commencement in November 2017, and 1 at mid-intervention 12 months later. In-School Champions were very keen to highlight the importance of face-to-face workshops, where reach was high (reaching 22 of 24 In-School Champions). In-School Champions made it clear that these face-to-face workshops were a method of attracting them to take on the role, stay motivated, exchange knowledge, and remain accountable to delivering the program. They also mentioned the importance of having a dedicated time to focus on PA4E1, away from distractions. Presented with the idea of not having any workshops, this was dismissed as a bad idea.

I don’t think so [not having face-to-face workshops]. You’d struggle to get it done. Put it off. Put it off. Put it off ... Face to face contact is always good ... with the online, you lose the Q&A nature of it. (In-School Champion, Focus Group 2)

We [in-School Champions] do face-to-face really, really, well. It’s a strength of our profession and the type of people we are. (In-School Champion, Focus Group 2)

Although the face-to-face workshops were deemed important by In-School Champions, it was recognized that this was complemented by implementation support from the External Support Officer (site visits, phone calls, and emails) and the PA4E1 website.

I think you need to have all those forms of contact [referring to face-to-face, email, phone calls and website], because sometimes it’s “I just need a quick answer.” Sometimes it’s “I have
a few questions.” But then the face to face is so necessary to stay motivated, to stay engaged. (In-School Champion, Focus Group 2)

While external support was noted as being important to In-School Champions, despite External Support Officers offering the prescribed dose of external support (facilitation) at each school, only 5 schools agreed to participate in the prescribed number of visits as per the protocol. Our project fidelity records indicate that most schools (18/24) received the prescribed number of contacts from an External Support Officer in the first 12 months of implementation support; however, in the second 12 month of implementation support, only one-third of schools received the prescribed dose of external support. In-School Champions suggested that they had built rapport with their Support Officers through the face-to-face visits, which may mean they became less required, and a shift toward phone calls and emails could occur once a relationship had been built between the Support Officer and In-School Champion.

[Support Officer Name] is really handy and has been invaluable. As you say, the prompts that you need because you’re so busy [speaking in third person about themselves], I feel like I can ring him up and say “look, this has happened” and he’ll go “righty-o, we’ll sort that out, you do this and I’ll do that.” (In-School Champion, Focus Group 3)

In-School Champions also highlighted the importance of developing a relationship with their External Support Officers, which made them feel accountable. The importance of External Support Officers having a relatable (ie, PE teacher) background was consistently discussed as important, so they resonated and could empathize through a mutual understanding of the challenges faced by teachers and ability to overcome such challenges.

The connection between us [In-School Champions] and the [External] Support Officer is so important. Whenever you email him [Support Officer], he will get onto it straight away … and so I always know what I need to do for everything because I have that support. And, if I needed him to come out for something, he’d do it. (In-School Champion, Focus Group 1)

He [Support Officer] is PE trained … so those face-to-face contacts [site visits], they’re not formal, they’re not for a slap on the wrist … it’s always, “how can I help you?” (In-School Champion, Focus Group 2)

While In-School Champions acknowledged the role of face-to-face events in making connections, the utility of using multiple delivery modes was further evidenced in the mixed-methods evaluation of the PA4E1 website which found the website was also a highly acceptable and appropriate delivery mode for In-School Champions and PE teachers, and usability of the website was high. The same evaluation also reported that In-School Champions accessed the website 48 times on average, indicating that the website was used approximately every 2 weeks throughout the 2-year program period. Further opportunities to enhance implementation support via the online tools were noted, for example, consideration of a community of practice online and to hold teleconferences instead of face-to-face workshops. In-School Champions also criticized the PA4E1 website discussion forum as a way of facilitating an online community of practice, describing it as not being user-friendly and having only very limited content and therefore not having the desired effect. In-School Champions highlighted opportunities of Facebook Groups as a delivery mode to create a community of practice as an alternative platform that is already used to knowledge share with other teachers.

We’ve [in-School Champions PE faculty] done a few conferences via teleconference. So maybe that’s a way … especially for those traveling from further afield … for us all to connect … I am more comfortable with it [teleconferencing] than I was four or five years ago, as it’s a way that I overcome being away from the metropolitan centre [Newcastle]. (In-School Champion, Focus Group 2)

Teleconferencing fills a gap, but it’s not ideal. (In-School Champion, Focus Group 2)

Both PE teachers and In-School Champions acknowledged the content quality and succinct nature of the PA4E1 training videos.

They do a good job [the professional development videos]. They were short … they were short and sweet. (PE teacher, school 7)

They’re quite short [the professional development videos] and they’re there to refer back to as often as you want. (In-School Champion, Focus Group 2)

**Theme 3: Recess and Lunchtime Activities and Equipment Provision (Practice 4) Are Easy-Wins for Most Schools**

Although there were 7 practices for schools to implement, the most discussed practice among PE teachers, In-School Champions, and Principals was the recess and lunchtime activities (practice 4). This practice included having freely available sports equipment for both recess and lunch breaks, as well as providing organized activities at recess and lunch breaks, led by teachers at least 3 days per week. Generally, having freely available sports equipment for unstructured use at breaks was seen as the key easy-win and described as popular among students by the PE teachers.

She [in-School Champion] put together access to sporting equipment that the students can just go and just grab whatever ball that they want from the basket. And that’s been really good. (PE teacher, School 4)

It was an easy sell [providing equipment to play with for students]. (Principal, School 2)

But they [students] can actually go and get balls now. That used to be a passive space [pointing, implying it’s not passive anymore]. (Principal, School 7)

Schools implemented different systems to provide equipment on loan to students, ranging from an honesty system to signature on pick-up to nonmonetary deposits (eg, students leave their bags in exchange for a ball).

An enabling factor of encouraging unstructured activity was the Head Teacher of Admin scheduling PE teachers into “active area” duties. This meant that PE teachers were allocated duties that were in areas of activity (eg, the playing field oval and the basketball court), rather than inactive areas (eg, canteen).

… they [Head Teacher Admin] tried to allocate playground duties for people who were interested in [physically active play]. (PE teacher, School 7)
We did unstructured and structured. We have the equipment on a three-tier shelf in the PE storeroom. The kids actually come up, sign for a basketball, soccer ball, handball ... and they just leave their bag. So, we have a chance of getting the equipment back [laughs], but some get lost over fences and on roofs etcetera. (In-School Champion, Focus Group 1)

Unstructured recess and lunchtime activity were consistently seen as an easy-win. At 12 months, 50.0% of schools were implementing this practice. But by 24 months, this increased to 60.9%, demonstrating that although found to be an easy-win, it still takes time to get the practice into place in some schools, suggesting ongoing implementation support in year 2 was useful. On the whole, the practice was seen as an easy-win; however, embedding structured activity (activities organized by a teacher) was not always seen as an easy-win. There was variation across schools. It seemed achievable for some schools, but a major challenge for others. A facilitating factor for structured activities was In-School Champions’ ability to engage their PE faculty, as well as teachers from other faculties, to deliver the structured recess and lunchtime activities.

In-School Champion 1: Structured recess and lunchtime is working really well for us. Something, which, inadvertently has got staff from a range of other faculties involved. Whereas in the past they’d just coach a team. Now they’re getting the whole school involved, so it’s not just a PE initiative, but a whole school thing.

In-School Champion 2: I’ve had the opposite of you [in response to prior in-School Champion]. Despite some verbal interest from some of the other teachers [in other faculties], I’ve never had a teacher from outside of PE come and help [with recess and lunchtime activities]. (In-School Champions, Focus Group 1)

Principals’ observations of PA taking place, as they walked around the school at recess and heard announcements at assemblies, helped to reinforce their value in the program.

It’s good to see the students moving at recess, and I encourage it ... because in a world where it’s easy to sit down and just hit your phone, I want to encourage the students to become more active. (Principal, School 8)

**Theme 4: Recruiting the “Right” In-School Champion to Support PA4E1 Is Key**

PE teachers suggested that an internal In-School Champion used in this trial was a better implementation support model than having somebody external to the school coming in to the school 1 day per week, as per the prior efficacy trial of PA4E1. Principals framed the role as an opportunity for PE teachers.

... PE teachers are, by and large, are looking for whole-school responsibilities ... you know, this [in-School Champion role] would be an ideal one. (Principal, School 9)

Choosing the right In-School Champion was seen as very important, Principals referred to the right “personality” for the role. Principals highlighted the success and failure of the program could largely be due to the In-School Champion. Choosing a champion that was highly motivated, for example, those who were looking for promotion or permanent contracts, was key. PE teachers highlighted that giving the role to someone with existing roles may be an issue (eg, School Sport Co-ordinator), as they may not have enough time.

Choosing the right person has been the most recurrent thing, the right person in the role [of in-School Champion]. And because she’s [the in-School Champion] gone into it wanting it to succeed, she’s built the capacity of those other teachers around her, who’ve gone with her . . . . (Principal, school 3)

I really think it was our poor School Champion which really made it a slow transition for us. I don’t think we have got as much out of it as we would have done. (PE teacher, school 7)

Principals suggested that communication and personal skills were important for the role, to engage Principals, PE faculty, whole-school staff, and parents. Although it was rare that an In-School Champion said they had confidently been able to engage all of these people.

She’s [in-School Champion] taken it, she’s aimed it, she’s integrated it throughout the school ... she’s got the communication and personal skills to make it successful. (Principal, school 3)

He’s there [the Principal], he’s supportive. He’s very passionate, but he’s got a lot on. He’s like “yeah, yeah, I am really behind it”. But then he goes back to his office. (In-School Champion, Focus Group 2)

Principals indicated concerns with some In-School Champions and PE staff, highlighting that several schools had changed their In-School Champions during the 2 years, on the belief they were not doing a very good job. The selection process and criteria for the In-School Champions may therefore be very important. One Principal suggested an expression of interest process may assist choosing an In-School Champion and/or to take part in the program and access the funding.

I’ve got young graduates that are keen as mustard. No other jobs [eg, Sports Co-ordinator]. There are people that I could now pluck out of the school . . . to be the right person for it . . . but well maybe the staff have to give you an expression of interest [for the in-School Champion role] . . . put out a little advert to the staff and say, “there’s a two period teaching allowance” and “this is the job description.” (Principal, School 1)

**Theme 5: The Perceived Need for, and Challenges Facilitating, Principal “Buy-in.”**

Principals unanimously outlined they supported the program and PA generally.

My philosophy is, you know, academics are really important, but if you don’t fill all of those other buckets ... you’ve got nothing. (Principal, School 7)

In-School Champions suggested that although the links between PA, learning, and health are well understood by PE teachers, programs to address PA are still not widely valued by broader school community and society, including principals.

[the need to address physical activity levels] ... it has been going around since the sixties [1960’s]. It’s like a merry-go-round, it just keeps going round [physical activity]. It will gain popularity, then it’ll get too hard, then it will come back again

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later on. It’s not going to go away. We’ve got to stop neglecting it when it gets too difficult. But, none of that’s within our control is it? (In-School Champion, Focus Group 3)

“PA4E1” or “Physical Activity 4 Everyone” was not widely recognized as a brand among Principals, it had a low profile in their priorities. This is despite their unanimous support for the general importance of PA for health, well-being, and learning. PE teachers and In-School Champions suggested this limited the scale and reach of the program within schools.

He [the Principal] doesn’t hate it. He knows it there. You know, he ticks a box. But it wouldn’t be the top of his priority list. (PE teacher, School 7)

In-School Champions most commonly reported challenges engaging their principals, relating slow uptake or implementation failure to a lack of principal buy-in.

The Principal needs to be on board to support everyone. Because then it filters down . . . it’s a cultural thing. It’s a cultural change . . . for example, we’d have no chance of getting extra duties [for teachers to be assigned to run recess and lunchtime activities] . . . it’s really hard without that Principal support, and how do you get a Principal to buy-in? (In-School Champion, Focus Group 1)

Theme 6: Staff Turnover Can Challenge Program Implementation

Project data indicated a high staff turnover. Across the 2-year implementation period in the 24 schools, 7 schools had a change of In-School Champion, 8 had a change in Principal, and 19 had new PE teachers.

Principals suggested that they changed their in-School Champions in the hope they would do a better job of implementation, or because the in-School Champion had moved schools.

The implementation last year, I don’t think was crash hot, and that’s a reflection on the people [PE teachers and in-School Champion] we had here. The brief was to pick it up and do something with it, which is what she [new in-School Champion] has been doing. So it’s very much an issue of having the right personnel. (Principal, School 5)

The lack of continuity of an In-School Champion leading the program implementation within the school made the 2-year implementation period particularly difficult for some schools.

You know, if people are serious about wanting to change these sort of issues, diet and activity, then you need time. (Principal, School 5)

Principal turnover was also somewhat common, with one-third of schools having a change in principals within the 2-year program. New principals lacked knowledge and history of the program.

I just need to specify . . . I’ve only been here for- for nine months . . . (Principal, School 9)

Most schools had a change in PE teachers. Staff turnover limited the feasibility of the implementation support, as new staff sometimes were not provided with the relevant background information about PA4E1. This meant that some teachers were more aware of the program than others. Schools were encouraged to onboard all new teachers in the training videos, although the opportunity to bring in new staff provided a welcomed opportunity to refresh the program.

The funny thing is the previous PE faculty thought that the pink fairies at the bottom of the garden were going to do it for them . . . and the moment we get the PE faculty turned over, look what happens. We’ve had better sporting results and more participation [in physical activity] this year than we’ve had for the last, five years at least. (Principal, School 5)

Theme 7. Engaging the Whole School Is Seen as an Important Challenge

An implementation support strategy under executive and leadership support was to have a Committee to oversee PA4E1, inclusive of school executive, which met termly. Almost half of the In-School Champions indicated they had not set-up or embedded PA4E1 meaningfully in any School Committee (n = 11/24). A third of schools had principals engaged in such committees (n = 7/24). Instead, the program was typically managed somewhat informally between In-School Champion, Head PE teacher (if different), and Principals. In-School Champions highlighted that it was difficult to engage school staff in meetings.

They’re all on-board [Principals, PE teachers], but I can’t get them to committee meetings . . . we’ve actually also had four faculties come on board and volunteer themselves, and that’s great, but I can’t get them to committee meetings. They say they want to, but when they’re giving up their own time, it’s been a challenge. (In-School Champion, Focus Group 1)

The last thing we need is another meeting . . . everyone’s interested, but nobody wants to go to a meeting. (In-School Champion, Focus Group 2)

PA4E1 provided opportunities for involvement of teachers outside of the PE faculty, including representation on the PA4E1 committee, supervision of recess and lunch activities (practice 4), and leading the enhanced school sport program (practice 3). Engaging teachers outside the PE faculty was seen as difficult for some schools, and easier for others. In-School Champions found that although some teachers were keen to support the program, when it became busy, they often resorted to their own core business instead. This meant they were unable or unwilling to support the schools’ PA4E1 committee (implementation strategy 1), supervision of recess and lunchtime activities (practice 4), or supervision of the enhanced school sport program (practice 3).

Despite some verbal interest from some of the other teachers [in other faculties], I’ve never had a teacher from outside of PE come and help [with recess and lunchtime activities]. (In-School Champion, Focus Group 1)

PE teachers and In-School Champions mentioned the need to raise the profile of PA in the school. It was not on the same level as literacy and numeracy. They also believed that the Department of Education placed greater emphasis on other subjects, and they considered that PA was not as important to the department as other competencies (eg, literacy and numeracy).

It’s well-supported. It’s well-implemented, the training, um, yeah. It’s [physical activity] just not taken seriously. (PE teacher, School 7)
In-School Champions and PE teachers highlighted difficulties in engaging parents in the importance of PA. Practice 7, school provision of PA messages to parents that were designed to increase their knowledge, attitudes, or support toward PA termly, was one of 2 practices implemented by over 80% of schools. This communication was mainly through newsletters, and the majority of schools were able to uptake this practice. In-School Champions and PE teachers implied there was limited reading of school newsletters and social media by parents. Therefore, despite the high implementation, the practice may have had limited reach or influence on the broader parent community in some schools. In-School Champions welcomed ideas and opportunities to connect with parents, as they valued their engagement.

So, we do a lot of stuff through Facebook. If we’re doing any activity, we can video them [the students] and put it on Instagram as well. (PE teacher, School 5)

Parents are our hardest to link with. We draw from a low socioeconomic background. We typically only get 20 parents at parent-teacher night out of a school of 800. We try. We’ve got the Facebook, newsletter and website (In-School Champion, Focus Group 3)

Practice 6 involved schools forming links with at least 3 community PA providers to support “outside of school time” activity for students (met by 2 of schools at 24 months [8.7%]). A desirable additional criteria were for at least 1 link to promote free or low cost options (met by 1 school). In-School Champions found it difficult to form community links with PA providers. Schools found it especially challenging to achieve the additional desirable criteria of forming community links that were low cost (affordable) or free for students. In-School Champions reported that most businesses they approached were unable to offer free activities.

Creating those free community links was probably the most difficult [practice]. We got as far as parkrun. But everything else had a fee involved. (In-School Champion, Focus Group 2)

Discussion

Principal Findings

The purpose of this study was to assist in the interpretation of trial findings. We conducted a mixed-methods process evaluation of PA4E1, focused on exploring the acceptability, appropriateness, and feasibility of PA4E1 from a range of perspectives. Overall, the program was highly acceptable, appropriate, and feasible. Seven themes were developed from mixed-methods analysis of the PA4E1 process evaluation data that highlight nuances with acceptability, appropriateness, and feasibility of program components than could strengthen ongoing scale-up of the program and inform the scale-up of others. These are discussed below in relation to the broader literature, as well as our previous process evaluation results describing adaptations, modifications, website usage, and subjective experience, and a per-protocol analysis. We conclude with recommendations to improve and adapt the PA4E1 program.

Theme 1: The Concept, Amount, Length, and Utility of Funding—All Important for Principals Decision to Adopt the Program

The PA4E1 funding was provided as part of an implementation support strategy designed to release the In-School Champion from their existing teaching load in order to lead the implementation of PA4E1 practices within their school. However, the provision of funding may have been a more effective incentive for recruitment and initial engagement than to facilitate implementation. Principals reported the 2-year funding was key in their decision to adopt the program. In a systematic review exploring school-level adoption and recruitment strategies used in school-based PA programs, email invitations were the key recruitment strategy discussed, with only 2 of the 14 included studies providing funding to schools. One study offered this as USD$4000 grants that schools could apply for. The other study, more similar to PA4E1, provided USD $4750 funding to new schools that adopted their program. Our findings indicate that some initial funding may be an important component of scale-up strategies requiring high rates of program adoption at a population level.

Following the initial decision to adopt PA4E1, the existence and length of ongoing funding may be an important driver of program maintenance in schools. The Child and Adolescent Trial for Cardiovascular Health study provided USD$3750 per year, for 4 years, for schools that continued with the program. In PA4E1, the proportion of schools adopting at least 4 practices was around 70% at 12 months and this was maintained at 24 months. Continuing school funding for PA4E1 beyond 24 months may act as a strategy to support sustained implementation in some schools. Access to ongoing funding could be contingent on a funding application, or completion of milestones, in order to increase the accountability and utility of the funding—especially as some schools reported needing funding more than others.

Theme 2: Multiple Delivery Modes of Implementation Support Perceived to Be Important and Complementary, Rather Than a Single Delivery Mode

PA4E1 implementation support was delivered via a variety of modes (Figure 2), including face-to-face workshops, face-to-face site visits, emails, phone calls, a Facebook group (in year 2 only), and a program website. The results of the process evaluation suggest that these modes of delivery were complementary. Similarly, in a systematic review comparing the relative effectiveness of different delivery modes for PA programs, there was no single delivery mode that was clearly more appropriate or more effective than another—with each delivery mode having unique strengths and limitations.

The drop-off in In-School Champions uptake of face-to-face modes of implementation support may be explained by a diminishing need for external implementation support once practices are embedded into the school culture, with In-School Champions accessing alternate delivery modes of implementation support (website, or phone calls, and emails with Support Officers). In this way, face-to-face implementation support may be part of the initial “activation energy” to kickstart the implementation of a program, but may become less important over time.

Our prior evaluation of the PA4E1 website usage and usability indicated website-based delivery was acceptable, appropriate, and feasible for certain tasks, but was less useful for other tasks, such as creating a community of practice to share ideas and overcome implementation challenges. Since COVID-19, when remote working and video calls became more commonplace, the acceptability of such modes may have improved or become more familiar. But taken together with the results of this process evaluation, it may be more appropriate to maintain a balance of delivery modes for school-based programs, as each mode of delivery can have a reinforcing effect on the others.

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**Theme 3: Recess and Lunchtime Activities and Equipment Provision (Practice 4) Are Easy-Wins for Most Schools**

Having sports equipment for unstructured use by students at recess breaks was seen as the key “easy-win” for increasing PA (appropriateness) and described as popular (acceptable) among students. Such program components, that are seen as “easy-wins” because they fit well into school routines (feasibility), may be a key way to demonstrate success early, and may drive ongoing sustainability of school-based programs in the real-world. For example, principals highlighted that they could observe changes in lunchtime behaviors, which further increased their buy-in to the program. Therefore, the identification of easy-wins may be a key implementation support strategy for future school-based programs. However, despite being an easy-win for most schools, we do not suggest this is a universal truth, as easy-wins may differ across schools depending on context.

Flexibility in implementation also appeared important. For example, schools were able to adopt various procedures for the loaning of sports equipment and schools chose the order in which practices were implemented to suit their school. Maintaining flexibility has been noted in previous research with school-based PA programs as a key driver of implementation success, but further evidence is required to explore adaptability in school-based programs.

**Theme 4: Recruiting the “Right” In-School Champion to support PA4E1 Is Key**

Principals noted the importance of having the right person to deliver the PA4E1 program within the school. Principals largely assigned success or failure of the program to the person in the role of In-School Champion. In one-third of schools, the In-School Champion changed during program delivery, with Principals noting competing demands (eg, other school roles) and a lack of interest as key reasons to replace an In-School Champion. Staff turnover is not unique to PA4E1, but commonly reported as a challenge in other PA programs in schools. The selection of the right In-School Champion is critical to implementation success; however, little guidance was given to principals on how to select a potential candidate. Providing implementation support to principals to guide this selection process and criteria for the In-School Champions may be an important strategy to ensure the right In-School Champion is recruited for the role. Identifying the right In-School Champions (eg, career development and motivated) and then preparing them for the role have been echoed by other school-based PA studies as an important implementation support strategy.

**Theme 5: The perceived Need for, and Challenges Facilitating, Principal “Buy-In.”**

Overall, principals reported the program was acceptable. However, PE teachers and In-School Champions indicated that it may not be a high priority for their principals. This is perhaps due to competing demands within the schools, which has been found to be one of the most abundant barriers to school-based PA programs. School support, including principal support, is also one of the most common facilitators to school-based PA programs. Strategies to increase principal buy-in are needed, especially as the endorsement of the In-School Champion has been shown to give the champion greater status in the school, and in turn increases their self-perceived effectiveness. For example, this might include demonstrating success and highlighting impact of PA4E1 to Principals, as well as increasing the reach of PA4E1 to expand its recognition with Principals. Expanding principal buy-in appears to be important, as echoed by other school-based process evaluations and a systematic review of facilitators to PA programs in schools. It may also be key for long-term sustainability—with a systematic review of school-based studies finding that the promotion of principal support is important to assist in the sustainability of school-based programs. Other strategies to increase principal buy-in may include scheduling an initial meeting to introduce the program (included in PA4E1), developing rapport with the principal, tailoring the program to the needs of the principal and school (flexibility and tailoring), seeking formal executive commitment to a tailored PA policy (included in PA4E1), developing an action plan, and building a coalition of support across the school community (parents, teachers, and students) to demonstrate the value and support for the program.

**Theme 6: Staff Turnover Can Challenge Program Implementation**

For PA4E1, there was high In-School Champion and PE teacher turnover, as well as some principal turnover. Some schools saw turnover as an opportunity to embrace change, but for many, it was a hindrance to the feasibility of delivering the program, as PA4E1 trained PE teachers and In-School Champions left the school. Staff turnover is not commonly cited as a barrier in school-based PA programs, perhaps due to their typically short implementation periods of <6 months. However, for longer and more real-world trials such as PA4E1, staff turnover is well recognized as a barrier to sustainability. Having procedures in place to mitigate the negative effects of school staff turnover may be useful and is also necessary for longer-term sustainment of programs, which require consideration in the implementation phase. For example, making training available school-wide and as part of school recruitment and onboarding processes may help to improve access to the training and not only tackle staff turnover, but also the next theme, whole-school engagement. Such strategies to mitigate negative consequences of staff turnover may be particularly important for sustainability, given that staff turnover increases over time. A promising strategy to address staff turnover is to increase program reach through scale-up—such that the program becomes routine across most schools. In this way, the negative consequences of staff turnover reduce as staff move from 1 PA4E1 school to another PA4E1 school. This may also result in a positive effect of knowledge sharing between schools.

**Theme 7: Engaging the Whole School Is Seen as an Important Challenge**

At times, In-School Champions struggled to engage their school communities, including their PE faculty, other faculties, parents, and their local community, impacting on program reach and some implementation results. For example, implementation support strategies designed to support whole-school engagement, such as having a PA4E1 school committee, had low reach across schools (n = 11/24). Similarly, the PA practice to engage in the development of links with community PA providers was the lowest performing practice and data from school staff did not generate any suggestions for how making free links could be better supported. Community and parent engagement is a commonly cited strategy to improve overall student PA levels across the whole day. Despite the practice relating to sending parent PA information being implemented by the vast majority of schools, school staff suggested that information provision is unlikely to be satisfactory to engage with parents in a meaningful way. This is supported by a
systematic review of school approaches to community engagement activities. This review identified that they are lacking, typically limited to newsletters and flyers.22 The review suggests the need to improve community engagement by using more creative methods,22 such as by hosting PA events with community and partners, sharing community facilities, involving families in sports days, and designing homework to increase family PA.51

Recommendations

Based on the results of this process evaluation, several recommendations and suggested adaptations are made in Table 4. These recommendations may be relevant for both PA4E1 and other school-based PA programs in similar contexts.

Table 4 Recommendations and Suggested Adaptations to PA4E1, Based on the Study Findings

<table>
<thead>
<tr>
<th>Recommendations for PA4E1 and other school-based physical activity programs</th>
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<tbody>
<tr>
<td><strong>Funding</strong></td>
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<tr>
<td>1. Provide some initial funding as this seems key in the decision for Principals to get involved in the program in the first instance</td>
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<tr>
<td>2. Provide further funding based on meeting implementation milestones, to increase accountability for the use of, and equitable access to, the funding</td>
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<tr>
<td><strong>In-School Champion</strong></td>
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<tr>
<td>3. Provide clear guidance to schools, to support them to choose the ideal In-School Champion (eg, a job description, desired characteristics)</td>
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<tr>
<td>4. Provide implementation support to In-School Champions to assist them with increasing Principal buy-in to the program (eg, case studies of how other In-School Champions have engaged their Principal in their schools physical activity)</td>
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<tr>
<td><strong>Training Videos</strong></td>
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<tr>
<td>5. Make available the professional development training videos to all staff at a school (to increase whole-of-school buy-in)</td>
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<tr>
<td>6. Incentivize completion of training with professional development accreditation (to increase whole-of-school buy-in by non-PE teachers)</td>
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<tr>
<td>7. Revitalize training videos periodically (eg, every few years), but continue to use notable and relatable educators to deliver the training</td>
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<tr>
<td><strong>Other Implementation Support Strategies</strong></td>
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<tr>
<td>8. Offer implementation support using a mix of delivery modes, including face-to-face, email, and phone calls (as initial face-to-face interactions led to accountability and buy-in with other delivery modes)</td>
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<tr>
<td>9. Continue to employ education trained staff to deliver implementation support to schools (teachers perceived support as relevant and relatable due to the experiences of the education trained staff)</td>
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<tr>
<td>10. Consider opportunities to create a more vibrant community of practice, possibly by focusing more on how schools that were successful managed to be successful (eg, sharing case studies and stories of success)</td>
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Abbreviation: PA4E1, Physical Activity 4 Everyone.

**Strengths and Limitations**

Study strengths include recruitment of a range of stakeholders from schools, including PE teachers, In-School Champions, and principals. This enabled a broader exploration of the themes, barriers, and facilitators as they relate to implementing and scaling-up PA4E1, as well as the triangulation of multiple viewpoints of the same central themes. The use of mixed-methods for the analysis is also a strength, as this generated cross-cutting themes across data sets, that start to explain the black box of how and why a program works or does not work.13 One notable exclusion was students, where data could be collected in future similar studies, to further strengthen the methodology.

The results of the current study are primarily relevant to the Australian context, and the global implications remain unknown, especially given the large differences between internal (school) and external contexts. In saying this, the barrier to implementation of school-based PA programs appears somewhat consistent globally with commonly reported barriers (eg, staff turnover, perceived priority to the school, and support from school community) from a range of studies internationally.49 Despite this, the relatability of findings to other programs should be done with careful attention to context, especially given that this trial and process evaluation was run pre-COVID-19, and the influences of COVID-19 on the internal contexts and processes in schools may have long-lasting impacts on how programs are adopted and implemented. However, this process evaluation still contributes valuable insights for PA intervention developers in secondary schools, given the paucity of existing process evaluations.10

The detailed process evaluation methodology applied in this study addresses the call for more detailed process evaluations of school-based programs for PA and perhaps serves as guidance for future studies.10 The results provide detailed themes relating to 3 of the 7 PA practices,6,7 as these were the practices that came out most saliently in the mixed-methods analysis. This pragmatic approach provides rich information on what is most salient to the respondents. But it may not provide information on all components of a program (all practices), limiting the scope of the results. While the findings are specific to implementing school-based PA program within Australian schools, many of the themes generated are consistent with previous research that have explored challenges with scaling-up and school-based PA programs.19-21,50 Therefore, our findings add to the small pool of literature that seek to overcome implementation failure16,52 and may have relevance to scaling-up of broader programs. Finally, although the themes identified were agreed on by the co-authors of this paper, who were involved in both data collection and analysis, ongoing consultation with the principals, In-School Champions, and PE teachers was not performed in the current study due to the onset of COVID-19 restrictions (after data collection), time constraints, and perceived participant burden.

**Conclusions**

The findings of this study add to the limited previous knowledge base surrounding the process of implementing a school-based PA program. They reveal the importance of attention to the nuances of acceptability, appropriateness, and feasibility of program components, as well as the overall program. Such data may be useful to inform future adaptations to the program. The suggested adaptations in this study may be used to inform a scalability assessment to assess the suitability of PA4E1 for ongoing delivery at a larger
scale (eg, state-wide). Tools and checklists exist to support scalability assessments of such programs.\textsuperscript{17,53}

A number of pragmatic recommendations are made, based on the themes, for adapting and improving PA4E1 and other school-based PA programs (Table 4).

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