Factors associated with the institutionalization of a physical activity program in Australian elementary schools.

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Abstract

Background: The health benefits of classroom based physical activity programs may only be sustained if programs are continually implemented over time. Despite the importance of instituting physical activity programs to ensure their continued implementation, little is known about factors associated with institutionalization of programs at a school level.

Purpose: To examine how school context, principal characteristics, and program attributes are associated with the institutionalization of Bluearth Foundation's Active Schools program in Australian elementary schools.

Methods: Current principals from schools who participated in the Active Schools program between 2015-2017 reported the level of institutionalization of the program, school context, principal characteristics, and perceived attributes of the program. Univariate associations were calculated using Pearson's correlation coefficient, independent sample t-tests and one-way ANOVA. Linear regression using backward deletion was used to calculate significant or marginally significant ($p<0.1$) multivariate associations.

Results: Thirty of the 211 eligible principals participated in the study. School capacity ($r=.617$, $p<.001$); perceived student behavioral ($r=.577$, $p<.001$), health ($r=.499$, $p<.001$), and enjoyment benefits ($r=.529$, $p<.001$), relative advantage ($r=.417$, $p=.022$), observability ($r=.385$, $p=.036$), and having the program delivered by a Bluearth coach at the time of the study ($\eta^2=.426$, $p<.001$), all had a significant positive univariate association with institutionalization. School capacity ($\beta=1.802$, $p=.001$), observability ($\beta=0.902$, $p=.061$) and having the program delivered by a Bluearth coach at the time of the study ($\beta=2.580$, $p=.003$) remained significant in the final multivariate model.

Conclusions: Results suggest schools which have someone who can provide support implementing a program are more likely to institute the program into policies and practices. It is also important school administrators have the tools to evaluate the benefits of physical activity programs and to perceive them as being beneficial for their students. However, schools may struggle to institutionalize physical activity programs after formal program delivery has concluded.

Keywords: sustainability, physical activity, school, health promotion, implementation

Background

Classroom based physical activities include the integration of physical activities into academic lessons, or short bouts of physical activity completed between the delivery of academic content. Classroom based physical activity may also take the form of structured physical activity sessions beyond those routinely delivered as part of the Physical Education curriculum. Research has demonstrated the potential of classroom based physical activity interventions to increase levels of physical activity in elementary school students [1, 2]. Additionally, there may be added benefits of combining mindfulness and physical activity components in interventions on physical activity behaviors [3]. There are several physical, mental and cognitive benefits associated with the engagement in physical activity in children [4]. Evidence also suggests classroom based physical activities may have positive effects on elementary school student's classroom behavior, cognitive functioning and academic achievement [2, 5]. However, the public health benefits of school based physical activity programs may only be achieved if effective programs are maintained within a school over a sustained period of time [6, 7].

The sustained implementation of physical activity programs may depend on the degree to which the program is institutionalized at a school [8]. Institutionalization is the degree to which a program is routinized and incorporated into an organization's policies and practices [9]. For example, classroom teachers from schools which institute policies and guidelines for the implementation of physical activity programs are significantly more likely to continually implement the program in their classroom [10]. Additionally, classroom teachers who have physical activity scheduled into their timetables are more than twice as likely to implement physical activity sessions with their students [11]. Whether administrators support a program and provide resources, such as suitable equipment, facilities, space and time to deliver the program, may also be important in ensuring the sustained implementation of physical activity programs in schools [7, 12].

Although institutionalization of physical activity programs in schools' policies and practices may be important to ensure its sustained implementation, little is known about factors associated with institutionalization of physical activity programs in elementary schools. However, research on the scaling up of health promotion interventions has highlighted organizational, policy maker, and program factors are likely to act as facilitators and barriers to institutionalizing programs into policy and practice [13]. For example, contextual factors that may be associated with whether a program is institutionalized include whether a program is compatible with existing organizational (i.e., school) structures and accepted by employees (i.e., teachers) [14]. Program institutionalization may also depend on whether an organization has the necessary human and financial resources to continually implement the program [13]. Additionally, policy makers (i.e. principals), determine priorities and make decisions about what to institutionalize into policy and practice [15]. Therefore, principal characteristics such as the degree to which they value physical activity may be associated with the institutionalization of a physical activity program in their school. Considering attributes of the program, programs that address a need, are simple to implement, and are able to be monitored and evaluated are more likely to be institutionalized [13, 16]. Therefore, the present study aims to examine how principal characteristics, school context, and attributes of the program are associated with the institutionalization of an evidence-based physical activity program in elementary schools.

Bluearth Active School's Program

The present study investigated Bluearth Foundation's Active Schools program.. The Active Schools program is a real-world word (i.e., non-researcher led), elementary school focused, evidence-based program that improves student's physical activity, health outcomes, and academic performance [17, 18]. The Active Schools program includes dedicated physical activity sessions, mindfulness-based activities, movement-based activities incorporated into academic lessons, and active breaks during academic lessons. Physical activity sessions are delivered in schools on a weekly basis for 60 minutes, alternating between Bluearth coaches and classroom teachers. The program seeks to develop a positive school movement ethos and culture, and school principals are encouraged to develop formal policies and timetabling to support physical activity inside and outside of the classroom. The program

117 also seeks to build the capacity of teachers to deliver all aspects of the program with their students.
118 Teacher training includes professional development workshops, online support materials, and weekly
119 training with a Bluearth coach during the physical activity sessions. More information about the
120 Active Schools program can be found on the Bluearth Foundation's website [19].

121 **Participants**

122 Participants eligible for this study were current principals from schools which had been involved with
123 the Active Schools program at any time from 2015-2017. Eligible participants were principals at the
124 school at the time of the current study, regardless of whether they were employed by the school when
125 the Active Schools program was last delivered there by the Bluearth Foundation. Bluearth provided
126 details of schools that were involved in Bluearth's Active Schools program between 2015-2017.
127 Participant recruitment occurred in three stages. First, approval was requested from the relevant
128 school jurisdiction ethics committees; second, Bluearth Foundation's CEO sent emails addressed to
129 principals to inform them the study was taking place; finally, study researchers invited principals to
130 participate in the study, initially via mail and then email follow-up for those who did not respond to
131 the mail invitation. Principals were asked to provide email consent to the research team for their
132 school to participate in the study and complete an online questionnaire.

133 **Procedures**

134 Data were collecting using an online questionnaire from March to September 2018, administered
135 using Qualtrics (Provo, UT) software. Several evidence-based strategies were used to increase
136 response rates, including initially contacting principals via mail, providing principals the opportunity
137 to go in to the draw to win a $100 gift voucher in jurisdictions with ethical approval to do, and
138 sending two reminder emails to non-respondents [20].

139 **Measures**

140 *Institutionalization of the Bluearth Program* was assessed using a modified version of the Level of
141 Institutionalization Scale for Health Promotion Programs [9]. The measure included 9 items;
142 examples of items include: *"Have goals and objectives for the continual implementation of the*

Bluearth program by the teachers at your school been put in writing?"; *"Has a timetable or schedule for the implementation of the Bluearth program by teachers at your school been mandated?"*; and *"Does your school have permanent physical spaces assigned where the Bluearth program can be conducted by teachers?".* Reponses options were no = 0 and yes = 1, which were summed to give a total program institutionalization score between 0-9. A higher institutionalization score indicates a school has taken more formal steps to embed the Bluearth Active Schools program into their curriculum and practices.

Demographics that were measured included the principal's age, gender, number of years' experience as a principal, and their country of birth. At a school level, principals reported school type (1=public school, 0=not a public school), whether the school had a specialist Physical Education teacher, whether the Bluearth program was currently being delivered in their school at the time of the study. Additionally, the school's Index of Community Socio-Educational Advantage (ICSEA) was recorded from an online database (https://www.myschool.edu.au/).

School context was operationalized as the school climate, subjective norms and general school capacity. School climate was operationalized as the prioritization of physical activity in the school, measured using a single item developed by Mâsse, McKay, Valente, Brant and Naylor [10]. Principals were asked to indicate how much they agree physical activity is a priority for their school (1=strongly disagree, 5=strongly agree). Subjective norms were measured using a scale modified from Martin and Kulinna [21]. Subjective norms were determined by assessing principals' perceptions of the beliefs of different social groups (i.e. fellow administrators, teachers, parents, and students) towards the importance of including the Bluearth Program in the curriculum (1=strongly disagree, 7=strongly agree), and their motivation to comply with these beliefs (1=not at all motivated, 7=extremely motivated). Subjective norm was calculated as the product of the set of questions for each social group. These four composite scores were averaged to create a subjective norm score. General school capacity was operationalized as the extent to which there is support for program implementation, measured using a single item adapted from Carlson et al. [22], which asked how strongly principals

agree there is at least one person who can provide teachers with guidance for implementing Bluearth activities at the school (1=strongly disagree, 4=strongly agree).

Principal characteristics that were measured were attitudes towards physical activity promotion, level of physical activity, and perceived benefits of the program. The School Physical Activity Promotion Attitudes Questionnaire (SPAPAQ) [23] was used to measure attitudes towards physical activity promotion. An example of the items include "*Primary school classroom teachers should provide physical activity for students daily as part of the school day."* Items were measured on a 4-point Likert scale from 1 = Strongly Disagree to 4 = Strongly Agree. The principal's level of physical activity was measured using a single item measuring the number of days in the last week they did a total of 30 minutes or more of moderate-to-vigorous physical activity for recreation or transport in the last week [24]. Perceived benefits of the program were measured using 7-item instrument developed by Carlson et al. [22]. The items assessed how strongly principals agreed the program improved student behavior, enjoyment and health. An example of the items include *"Students stay on task more after they participate in the Bluearth program."* All items were measured on a 4-point Likert scale from 1=strongly disagree to 4=strongly agree.

Attributes of the program were measured based on an instrument developed from Rogers' diffusion of innovations theory [25]. The 9-items used assessed the relative advantage of the Bluearth program over Physical Education, the simplicity of understanding and teaching the program, and the observability of the outcomes of the program. An example of items included *"The Bluearth program is better than Physical Education classes for physical activity promotion."* All items were measured on a 4-point Likert scale from 1=strongly disagree to 4=strongly agree.

Data Analysis

Univariate associations with standardized continuous variables were calculated using Pearson's correlation coefficient and associations with categorical variables were calculated using independent sample t-tests and one-way ANOVA. Predictor variables with a significant ($p<0.05$) univariate association with institutionalization were entered into a single multiple linear regression model. Next,

backwards deletion was conducted to delete all predictor variables until only variables significant at $p<0.10$ remained in the model. The sample size was considered large enough to estimate accurate regression coefficients for the number of predicator variables in the linear regression model [26].

Results

Descriptive statistics

Overall, 30 of the 211 eligible principals participated in the study (14% response rate). Schools that participated in the study on average had the program delivered more recently by a Bluearth coach than schools that did not participate ($p=0.002$). There was no significant association between participation in the study and school type (i.e., government or non-government) or level of socio-educational advantage. Descriptive statistics for participants are displayed in Table 1.

Table 1 about here

Bivariate and multivariate associations with institutionalization

Results from univariate analyses on level of institutionalization are displayed in Table 2. Results show having the Bluearth program delivered in the school by a Bluearth coach at the time of the study was significantly positively related to institutionalization ($\eta^2=.426$, $p<.001$). None of the principal demographics were associated with institutionalization of the Bluearth program. Of the hypothesized institutionalization factors, 6 of 11 had significant positive associations with institutionalization. From school context, only general school capacity ($r=.617$, $p<.001$) was significantly associated with institutionalization. From principal characteristics, perceived behavioral benefits ($r=.577$, $p<.001$), enjoyment benefits ($r=.529$, $p<.001$), and health benefits ($r=.499$, $p<.001$) all had a significant association with institutionalization. From attributes of the program, relative advantage ($r=.417$, $p=.022$) and observability ($r=.385$, $p=.036$) had significant positive associations with institutionalization of the Bluearth program

Table 2 about here

The results from the multivariate analysis are displayed in table 3. Having Bluearth delivered at the time of the study remained significant (β=2.580, p=.003) in the multivariate analysis. Of the five institutionalization factors that had a significant univariate association, only general school capacity (β=1.802, p=.001) was significantly positively associated with institutionalization in the multivariate model. Additionally, observability (β=0.902, p=.061) almost reached significance.

Table 3 about here

Discussion

The present study examined associations between the school context, principal characteristics and attributes of the program and institutionalization of a physical activity program in Australian elementary schools. Identifying factors associated with institutionalization of physical activity programs is important because schools that institutionalize physical activity programs are more likely to sustain program elements at their school [10] To the authors' knowledge, this is the first study to examine factors associated with institutionalization of a classroom based physical activity program into school policies and curriculum.

The results from this study show school capacity is associated with the institutionalization of a classroom based physical activity program. Having at least one person who can provide teachers with guidance on implementing a physical activity program is associated with taking more formal steps to institutionalize the program into the schools policy and practices. This suggests having a staff member at the school take an active role in championing the program may motivate principals to institute a program into school policies and curriculum. However, these results could also be a result of reverse causation whereby schools identify or appoint a staff member at their school whose role it is to support the continued implementation of a program as a consequence of institutionalizing the program. Nevertheless, it appears identifying and supporting a program champion to take a leadership role may increase the likelihood health programs are sustained [27, 28]. Therefore, schools should identify a staff member who can take an active role in advocating and supporting physical activity programs.

This research also showed that observability of the program benefits were positively related to program institutionalization. Therefore, principals should be made cognisant of tools and techniques that allow them to evaluate the effectiveness of physical activity programs at their school. Having tools to evaluate the program allows principals to make informed decisions about whether it is worthwhile continuing to implement a program [14]. In univariate analyses, principal's perceptions of the relative advantage of the Bluearth program, and perceived student behavior, health, and enjoyment benefits were also associated with program institutionalization. Collectively, these findings suggest principals take more steps to institutionalize a physical activity program when they are able to evaluate the outcomes of the program and believe it provides valuable and tangible benefits for their students above those of Physical Education.

The present study also found schools which reported not having the Active Schools program delivered by the Bluearth Foundation at their school at the time of the study had significantly lower levels of institutionalization than those who did have the program at their school at the time of the study. This shows schools may struggle to institutionalize physical activity programs once the formal program is no longer delivered at their school. Therefore, physical activity programs might be unsustainable beyond the formal implementation of the program by researchers or, in the case of this study, an external provider.

Considering many schools were unable to institutionalize the Bluearth Active Schools program into their policies and practices, it appears continued investment in program delivery by an external provider might be necessary to sustain a program and its associated benefits. Given the costs associated with outsourcing the delivery of a physical activity program, it is likely this would impact schools with limited financial resources who may be unable to afford the sustained implementation of the program. Unfortunately, schools with the least financial resources are likely to be those in greatest need of increased physical activity during the school day [29]. Although opportunities to apply for funding and grants to deliver physical activity programs in schools do exist [30], these often involve detailed application processes that in themselves are resource intensive, highly competitive, and are short term in nature. Given the substantial evidence of the health and educational benefits of school-

based physical activity, it seems imperative governments at all levels provide leadership in school physical activity promotion and adequately resource schools to implement and sustain physical activity programs [31]. Historically, we have seen that government commitment and investment is necessary to have a meaningful impact on population levels of physical activity [32].

Although this study contributes to the understanding of factors associated with the institutionalization of physical activity programs at schools, it has some limitations that must be considered when interpreting the results. First, although the sample size was large enough to estimate accurate regression coefficients, the small sample size means the study may not sufficiently powered to detect medium or small effect sizes. Secondly, this study employed a cross-sectional and quantitative study design and therefore could only infer association not causation, and was limited in its ability to provide an in-depth understanding of the influence of contextual factors. Thirdly, this study only achieved a response rate of 14%, and those who responded were more likely to have the Bluearth program delivered in their school by a Bluearth coach more recently. It is possible principals who have not taken steps to institutionalize the program may not be motivated to participate in the study. Finally, we could not verify whether the principal who completed the questionnaire was the principal who was at the school at the time of the delivery of the Bluearth program.

Conclusion

Although instituting physical activity programs within schools may ensure sustainability, very little is known about what factors are associated with program institutionalization. The findings of this study showed schools who have someone who can provide support for implementing the program take more steps to institute the program into policies and practices. Our findings also highlight that it is important principals have the tools to evaluate the benefits of physical activity programs and perceive that such programs are beneficial for their students for institutionalization to occur. However, schools in this study which had taken more steps to formally institutionalize the program at the school had the program delivered by the Bluearth Foundation at the time of the study. This indicates it may be difficult for schools to embed the program into their policies and practices after the formal completion of the program. Therefore, further research is needed to understand factors which may contribute the

institutionalization of evidence based physical activity programs in schools after the formal completion of the program. The field would also benefit from future quantitative research to develop an in-depth understand the influence of contextual factors on the institutionalization of physical activity programs in schools. Additionally, research should identify ways to support schools to institutionalize physical activity programs to ensure programs and their associated benefits are sustained.

Declaration

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Conflicts of Interest: None to declare.

Primary Data: The authors have full control of the primary data. Request to access data sets can be made to the corresponding author. Applicants will be required to gain ethics approval from the Victoria University Human Research Ethics Committee and the applicable educational jurisdictions human research ethics committees prior to being granted access to data.

Authors Contribution: Author 1 contributed to the design of the study, conducted data collection, analysis and interpretation and contributed to the write-up of the manuscript; Author 2 contributed to the design of the study, assisted with data collection, interpretation of data and write up of the manuscript; Author 3 conceptualized the study, managed the project and contributed to all aspects of the study.

Ethics Approval: Ethics approval was received from the Victoria University HREC (HRE18-016) and all educational jurisdictions involved in the study. All participants provided consent to be involved in the study.

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Table 1- Descriptive statistics

School Demographics (n=30)	***%***
Public School	60.0
Bluearth currently at School	73.3
ICSEA (M[SD])	980.77[58.48]
Specialist Physical Education Teacher	40.0
Principal Demographics (n=30)	***%***
Female %	63.3
Age %	
20-39 years old	20.0
40-49 years old	13.3
50-59 years old	56.7
60 years or older	10.0
Australian born	96.7
Principal years' experience (M[SD])	8.11[8.83]
Institutionalization Score (M[SD])	4.83[2.78]

Table 2- Univariate associations with institutionalization of Bluearth Foundation's Active Schools program

	Pearson's r	p-value
School demographics		
ICSEA	-.132	.486
Principal demographics		
Years' Experience as Principal	.192	.309
School Context		
School Climate	.183	.333
School Capacity	**.617**	<.001
Subjective Norms	.235	.210
Principal Characteristics		
Level of Physical Activity	.115	.543
Physical Activity Promotion Attitude	.267	.153
Student Behavior Benefits	**.577**	<.001
Student Enjoyment Benefits	**.529**	<.001
Student Health Benefits	**.499**	<.001
Attributes of the Program		
Relative Advantage	**.417**	.022
Simplicity	.338	.068
Observability	**.385**	.036
School demographics	**M(SD)**	**p-value**
School Type		
Public School	4.39(2.85)	.291
Not Public School	5.50(2.65)	
Specialist PE Teacher		
Yes	5.42(2.81)	.357
No	4.44(2.77)	
Bluearth Currently Delivered		
Yes	**5.91(2.05)**	<.001
No	**1.88(2.41)**	
Principal demographics		
Gender		
Female	4.79(2.94)	.912
Male	4.91(2.63)	
Age		
20-39 years old	3.67(1.75)	.581
40-49 years old	4.75(3.95)	
50-59 years old	5.41(2.87)	
60 years or older	4.00(2.65)	

Bolded figures significant at p<.05

Table 3- Significant multivariate associations with institutionalization of Bluearth Foundation's Active Schools program

Factor	Coefficient (95% CI)	Sig
Bluearth Currently Delivered	2.580 (0.930, 4.230)	.003
School Capacity	1.304 (0.600, 2.008)	.001
Observability	.666 (-0.032, 1.365)	.061
Intercept	2.941 (1.569, 4.314)	<.001