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After-school Providers Confidence, Knowledge, Attitudes, and Ability to Promote Health Behaviours

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Abstract

Comprehensive school health (CSH) is an effective approach to support children's health and wellbeing. There is a need to extend CSH to the after-school hours to further promote healthy eating (HE) and physical activity (PA). Within after-school settings, care providers influence children's HE and PA opportunities, but little is known about their role in health promotion interventions. The School's Out…Let's Move (SOLMo) intervention provided this opportunity. Providers in intervention and control sites completed surveys pre (n=35) and post (n=37) intervention, with seventeen completed at both time points. Analysis examined changes in awareness, knowledge, confidence, attitude, and behavioural control towards promoting HE and PA, and confidence in leading HE and PA activities. SOLMo providers attitudes towards promoting HE and PA were significantly higher ($p<0.05$) compared to usual practice providers, as was their confidence to lead HE activities ($p<0.05$) for five conditions. Results suggest CSH is a promising approach for this setting.

Keywords: after-school; health promotion; healthy eating; physical activity; comprehensive school health

Résumé

Le concept d'*Approche globale de la santé en milieu scolaire (Comprehensive school health - CSH)* est une approche efficace pour améliorer la santé et le bien-être des enfants. Il s'avère nécessaire d'utiliser cette approche dans la période après l'école pour promouvoir une saine alimentation et la pratique d'activité physique. Dans ce contexte, les intervenants offrent aux enfants des occasions de développer des connaissances sur la saine alimentation et des occasions de pratique d'activité physique, mais nous avons peu de connaissances sur leur rôle dans des interventions portant sur la promotion de la santé. L'intervention *L'école est finie … on bouge (School's Out…Let's Move (SOLMo))* permet de mieux cerner ce rôle. Des intervenants dans un milieu de mise en œuvre de cette intervention et dans un milieu « contrôle » ont complété des questionnaires pré (n=35) et post (n= 37) intervention; de ces intervenants, 17 ont complété le questionnaire en pré et en post intervention. L'analyse cherchait à déceler des changements dans la prise de conscience, la connaissance, confiance, l'attitude et le contrôle des comportements dans la promotion d'une saine alimentation et de la pratique d'activité physique, en plus de la confiance à mener des activités sur la saine alimentation et d'activité physique. Les attitudes des intervenants *SOLMo* envers la promotion d'une saine alimentation et la pratique d'activité physique étaient significativement supérieures ($p <0,05$) à celles des intervenants du groupe contrôle, de même que leur confiance à mener des activités sur la saine alimentation ($p < 0,05$) pour cinq situations. Les résultats suggèrent que le concept *Approche globale de la santé en milieu scolaire (CSH)* s'avère prometteur dans ce contexte d'activités après l'école.

Mots clés : activités après l'école; promotion de la santé; saine alimentation; activité physique; *Approche globale de la santé en milieu scolaire (Comprehensive school health -CSH.*)

Introduction

Health promotion in school communities has emerged as a popular strategy to support student health and wellbeing as schools have the ability to reach the majority of children in the population (Evans et al., 2015). School-based interventions, specifically those taking a comprehensive school health (CSH) approach, have been effective at improving children's diet, physical activity, and weight status (Fung et al., 2012). Additionally, it has been reported that healthy children learn better (Faught et al., 2017). Globally, CSH is recognized as an evidence-based framework which uses a 'whole-setting' approach to support improvements to educational outcomes by addressing school health (Joint Consortium for School Health, 2019). While school-based health promotion interventions have been effective, constraints due to the demands of academic curriculum and time have been reported in the school setting (Amini et al., 2015; Campbell et al., 2015). Aligning with the global recommendation to end childhood obesity (World Health Organization, 2016), efforts to explore additional strategies are warranted. The after-school hours of 3:00-6:00 p.m. have garnered interest in recent years. The after-school care setting has demonstrated the ability to encourage healthy eating (HE) (Gilbert et al., 2012) and improve physical activity (PA) levels among school-aged children (Kim & Lochbaum, 2017; Beets et al., 2015); thus, these critical after-school hours provide an opportunity to complement existing school-based health promotion strategies (Afterschool Alliance, 2015; Coleman et al., 2008). Specifically, health promotion strategies in the after-school care setting which use a 'whole-setting' approach are logical and complementary to school-based interventions.

After-School Care Providers

The after-school setting has become a unique and prominent setting for child development. After-school programs aim to prioritize and adapt to children's current needs, especially regarding the needs of low-income children (Halpern, 2002). Apart from school and home, after-school programs are viewed as the next critical development setting for many children, notably for low- and moderate-income children (Halpern, 2002; McDaniel & Yarbrough, 2016). Within the after-school care setting, care providers are responsible for program planning and activity delivery, impacting HE and PA opportunities for children (Dzewaltowski et al., 2010; Dinkel et al., 2014). Thus, the structures and processes in the after-school context can help to promote HE and PA among children. Given the lack of a standardized curriculum and programming in the after-school setting (Government of Alberta, 2016), site leaders within each organization are responsible for developing the programming offered at their site, which includes snack options and specific activities. Thus, care providers have a significant influence on the healthy opportunities available for children provided through the physical and social environment of the site (Copeland et al., 2012; Weaver et al., 2016) . Their interactions with children, as well as the education provided, impacts children's healthy choices (Weaver et al., 2016).

Despite the critical role care providers play in the after-school care context, including their prominent role in promoting HE and PA (Hastmann et al., 2013; Kenney et al., 2014), few studies have considered the perceptions of care providers in the implementation of health promotion interventions (Zarrett et al., 2018; Sharpe et al., 2011). More specifically, there is very limited research in regards to the perceived abilities of care providers to deliver such interventions. Dobson et al. (2012) conducted focus group interviews with care providers who delivered a health

promotion intervention in the after-school care setting, and suggested the influential role care providers play throughout implementation. Specifically, these authors noted that staff reported feeling empowered and excited to promote HE and PA. Staff from intervention sites reported engaging in conversations with parents on the importance of HE and PA and talking to their colleagues about the benefits of the intervention. Recent qualitative work by our team (Elias et al., 2020) echoed these results and described in more detail how care providers enhance awareness, improve programming, build relationships, and take a collaborative approach in promoting health. Additional quantitative and qualitative research among care-providers in the after-school setting would help inform interventions in this setting.

In order for care providers to promote healthy lifestyles for children, they must model these behaviours accordingly (i.e., provide and promote those opportunities). Similar to other behaviours, the act of promoting HE and PA depends on numerous factors for the care provider. According to the theory of planned behaviour (TPB) (Ajzen, 1991), intention to perform a behaviour depends on three constructs: attitude, social norms, and perceived behavioural control (Ajzen, 1991). Perceived behavioural control is conceptually linked to Bandura's concept of self-efficacy (Bandura, 1997). Though not specific to TPB, studies have found teachers attitudes towards HE and PA affected their motivation to promote HE and PA within their school (Kulinna, 2016; He et al., 2014). Self-efficacy is needed to effectively promote health behaviours (Ajzen, 2002), such as HE and PA. Low self-efficacy or 'confidence' (a term often used to describe the construct) have been reported as barriers for many health promotion interventions (Campbell et al., 2015; Zarrett et al., 2018), specifically those using comprehensive approaches to promote healthy lifestyles for children (Hastmann et al., 2013; Kulinna, 2016; Storey et al., 2012).

Although these studies provide insight into the critical role of care providers in promoting health behaviours, more research is needed to further explore care providers' perceived ability to promote HE and PA in the after-school context. Understanding care providers' perceptions is necessary to implement effective health promotion interventions within after-school care settings, as care provider perceptions directly impact the delivery of health promoting activities. Therefore, this study aimed to evaluate care providers' perceived ability to promote HE and PA in an after-school health promotion intervention (i.e., SOLMo) based on the CSH approach, using a two-group pretest-posttest design.

Setting: The School's Out…Let's Move Intervention

School's Out…Let's Move (SOLMo) was an after-school intervention, developed by Ever Active Schools (Ever Active Schools, 2014), which aimed to improve HE and PA opportunities for children. Ever Active Schools is a provincial initiative in Alberta, Canada, designed to create and support healthy school communities using a CSH approach. SOLMo was guided by the CSH approach and had two main goals: (a) to serve a healthy snack with a vegetable or fruit, and milk or water as the drink, and (b) to include 30 minutes of moderate-to-vigorous PA by encouraging/promoting the love of movement. While sites were encouraged to implement both these goals daily, using resources provided, the CSH approach allowed for flexibility in how sites individually delivered the program. The SOLMo intervention took place over a six-month period, September 2016 – February 2017. Site enrollment varied across sites, ranging between 20 to 100 children, with a mean enrollment of 58 children. The number of children attending each day also varied, depending on parent/guardian childcare needs. Additional details regarding the SOLMo intervention have been published elsewhere (Elias et al., 2020).

Research was an important component of SOLMo, and used to assess both the implementation and effectiveness of the intervention. A process evaluation was used to assess implementation. To measure effectiveness, SOLMo used a quasi-experimental pre-post evaluation design and included child (measured body mass index, piezoelectric time-stamped pedometers, and direct snack observations) and site-level (site observations and logs) measures in both intervention and usual practice (i.e., control) sites to allow for comparisons (results presented elsewhere). This included a total of four intervention (i.e., SOLMo) sites, and four usual practice (i.e., control) sites to allow for comparisons.

After-school sites were recruited from a western Canadian metropolitan region. Inclusion criteria were as follows: after-school programs, operating hours of approximately 3:00–6:00 p.m., designed for children aged 5-12 years, and commitment by sites to participate for the duration of the study period. Half of the sites (n=4) received the intervention, and the other sites (n=4) remained as usual practice sites (i.e., control sites). Sites were not randomized but were allocated to receive the intervention based on preference and timing, as well as size and location (i.e., rural and urban). To ensure that all sites received the benefits of the intervention, all were offered the intervention following the study period. Location of sites included both urban (n=5) and rural (n=3), and included sites located within a school setting (n=4) and within the community (n=4). All sites were providing general after-school childcare, and none involved specialized programming (e.g., sports clubs, music clubs, religious study).

One aim of the SOLMo intervention was to improve care providers' ability to promote and improve HE and PA opportunities for children in the after-school setting. As such, the intervention provided HE and PA resources, workshops (two 1-hour workshops for each site as requested), and team coaching (at least one coaching session per site). The intention was to increase care provider knowledge and confidence to promote HE and PA. Workshops and coaching were scheduled flexibly to accommodate care provider availability. For three sites these occurred within the first six weeks of site recruitment. Due to scheduling challenges for one site, these occurred within ten weeks. Sessions were delivered by a registered dietitian with expertise in health promotion with the support of nutrition major students. Care providers were encouraged to use the resources, and apply the workshop and coaching lessons throughout the intervention period to deepen their experiential learning. Additional resources or training were provided throughout the intervention as requested by individual sites. Workshops focused on nutrition education (e.g., knife safety and healthy snack preparation). Coaching focused on how to use the resources provided and ways to encourage intake of vegetables and fruit at snack time as well as encouraging MVPA. The focus of the present study was to understand care providers' perceptions regarding their ability to promote healthy lifestyle behaviours. Specifically, the purpose was to examine changes in SOLMo care providers' perceived awareness, knowledge, confidence, attitude, and behavioural control towards promoting HE and PA, and their confidence in facilitating activities under challenged conditions in comparison to usual practice care providers.

Methods

Study Design and Population

Overview

This study used a two-group pretest-posttest design to assess care providers' perceived awareness, knowledge, confidence, attitude, and behavioural control towards their ability to provide HE and PA opportunities for children. The independent variable was the SOLMo intervention. Dependent variables included perceived awareness, knowledge, confidence, attitude,

and perceived behavioural control towards promoting HE and PA, as well as confidence in facilitating HE and PA activities under challenged conditions, such as '*when other site staff disagree with its importance'* or '*when children are not engaged.'* This study design was critical to distinguish changes resulting from the SOLMo intervention compared to the control sites. All after-school care sites approved the study, and all participants provided written consent. Ethical approval for this study was obtained from the Health Research Ethics Board from the participating university.

Participants

All care providers from participating sites were invited to participate in this study either in-person or via e-mail. Individuals were provided an information letter, given an opportunity to ask questions, and consented prior to participation. The pre-intervention survey was administered immediately following recruitment; the post-intervention survey was administered at 6-months. At pre-intervention 35 (SOLMo n=13; control n=22) of 41 (SOLMo n=18; control n=23) care providers returned the survey; at post-intervention 37 (SOLMo n=11; control n=26) of 44 (SOLMo n=15; control n=29) care providers returned the survey. Given the frequency of staff turnover in all sites (common in childcare (McDonald et al., 2018), a total of seventeen individuals returned the survey at both pre- and post-intervention and thus could be included in the analyses.

Instrument

A survey was used to examine care providers perceived awareness, knowledge, confidence, attitude, and behavioural control towards promoting HE and PA and confidence in facilitating activities under challenged conditions. Surveys were self-reported and administered either in-person or distributed by mail to all after-school care providers from both intervention (i.e., SOLMo) and control sites. Surveys were completed at both pre- and post-intervention. The survey was adapted from two previously validated questionnaires, the Healthy Opportunities for Preschoolers (HOP) questionnaire (Naylor & Temple, 2013), and the School Health Facilitator Self-Efficacy Survey questionnaire (Leurs et al., 2007; School-based Intervention Research through Changes in Lifestyles & Environments (SIRCLE), 2012). The HOP questionnaire is based on the theory of planned behaviour (Ajzen, 1991) and includes questions to measure two constructs, attitude and perceived behavioural control. Self-efficacy questions were included to measure awareness, knowledge, and confidence in care providers' perceived ability to promote HE and PA. Questions regarding confidence in facilitating activities under challenged conditions were adapted from the School Health Facilitator Self-Efficacy Survey. All modifications to questions were made to reflect the appropriate school-age range for children, and the after-school care setting. Modifications of the survey questions were reviewed by three experts in the field for face validity prior to conducting the study, as per the protocol by Bryman (2012).

The resulting survey included demographic questions and questions examining awareness (3 questions each for HE and PA), knowledge (4 questions), confidence (3 questions), attitude (4 questions regarding affective, 4 questions regarding cognitive), behavioural control (2 questions), and confidence in facilitating activities under challenged conditions to promote either HE (13 questions) or PA (13 questions). The questions pertaining to awareness, knowledge, confidence, attitude, and behavioural control were scored using a Likert-type scale. The questions pertaining to confidence in facilitating activities under challenged conditions was scored on scale from 0–100. The resulting score for each variable (i.e., awareness, knowledge, confidence, attitude, behavioural control, confidence in facilitating HE and PA activities under challenged conditions) was derived from the sum of responses from items in each variable divided by the number of items.

Data Analysis

Characteristic differences between intervention and control groups were measured using paired t-tests (child care, after-school care, site experience, age) and Fisher's exact test (gender, education). Linear regression was used to determine the average change in the effect of the intervention between the groups for each variable, controlling for baseline measures. Outcome variables measured in the survey included: awareness in promoting HE and PA, knowledge in promoting HE and PA, confidence level in promoting HE and PA, attitudes towards promoting HE and PA, and perceived behavioural control in promoting HE and PA. The outcome variable perceived confidence in facilitating HE and PA activities under challenged conditions were analyzed separately for each challenged scenario based on the analysis from the validated tool (Leurs et al., 2007; SIRCLE, 2012). The statistical analysis software program, Stata (Version 12, StataCorp, TX, USA) was used for analysis. A $p<0.05$ indicated significance.

Results

Participant Characteristics

Participant demographics are presented in Table 1. Paired t-tests and Fisher's exact test indicated non-significant differences between the intervention and control groups. Due to changes in staffing, a total of 17 participants completed both pre- and post-intervention surveys, and were included in the analyses. Ten participants (59%) were from the control group, and seven (41%) were from the intervention group. The majority of the participants were female (n=16), and between 19 and 60 years of age. Participants included full- and part-time staff, with varying years of experience in child care (ranging between one month to twenty years). Education level of participants ranged from high school to post-secondary.

Table 1
Characteristics of Intervention (SOLMo) and Usual Practice Care Provider Participants

Characteristic	Mean ± SD or % (n)			
	Total (n=17)	*Intervention (n=7)*	*Control (n=10)*	*p-value*
Gender, (%) male	6 (1)	0	10 (1)	0.588
Age, (yrs)	32 ± 13	37 ± 16	28.5 ± 10	0.062
Education				0.559
Secondary	24 (4)	29 (2)	20 (2)	
Post-secondary	76 (13)	71 (5)	80 (8)	
Child care experience (yrs)	8.2 ± 1.6	9.2 ± 2.6	7.5 ± 2.1	0.611
After-school care experience (yrs)	5.2 ± 0.9	5.6 ± 1.3	4.9 ± 1.2	0.674
Site experience (yrs)	4.8 ± 1	6.4 ± 2	3.6 ± 1	0.167

Perceived Awareness, Knowledge, Confidence, Attitude, and Behavioural Control towards Promoting HE and PA

Table 2 presents the changes in the mean values for the intervention and control groups regarding the care providers' perceived awareness, knowledge, confidence level, attitude, and perceived behavioural control towards promoting PA and HE from pre- to post-intervention. Differences in the changes of the mean values between the groups were calculated from a linear regression model for each variable, controlling for baseline measures. The intervention resulted in a significant change in care providers' attitudes towards promoting PA (p<0.05). The change in attitude towards promoting PA increased by 0.518 in the intervention and decreased by -0.083 in the control. The difference in the changes were statistically significant [Adjusted difference: 0.562 (0.12-1.01)]. Similarly, the change in attitude towards promoting HE increased by 0.143 in the intervention and decreased by -0.021 in the control. The difference in the changes were also statistically significant [Adjusted difference: 0.407 (0.05-0.76)]. The intervention did not have a significant effect on the other variables (i.e., awareness, knowledge, confidence, behavioural control) regarding care providers' perceived ability to promote PA or HE.

Table 2
The Effect of SOLMo on the Six-Month Change in Care Providers' Perceived Ability to Promote Physical Activity and Healthy Eating from Pre- to Post-Intervention (n=17)

	Six-month change from pre- to post-intervention		Difference in the change between intervention and control groups			
			Unadjusted	*Adjusted*[†]		
Variable for Physical Activity	Intervention n=7 *Mean (post-pre)*	Control n=10 *Mean (post-pre)*	*β-coefficient*	*β-coefficient*	*95% CI*	*p-value*
Awareness	-0.111	-0.033	-0.078	0.0157	[-0.68, 0.71]	0.962
Knowledge	0.357	-0.194	0.552	0.240	[-0.33, 0.92]	0.332
Confidence	0.333	-0.167	0.500	0.267	[-0.33, 0.86]	0.350
Attitude	0.518	-0.083	0.601	0.562	[0.12, 1.01]	0.017
Behavioural control	0.262	0.167	0.095	0.160	[-0.27, 0.59]	0.443
Variable for Healthy Eating						
Awareness	-0.238	-0.033	-0.205	-0.141	[0.72, 0.44]	-0.52
Knowledge	0.214	-0.281	0.500	0.099	[-0.39, 0.58]	0.665
Confidence	-0.143	-0.400	0.257	0.15	[-0.53, 0.83]	0.642
Attitude	0.143	-0.250	0.393	0.407	[0.05, 0.76]	0.029
Behavioural control	0.048	-0.021	0.068	0.096	[-0.55, 0.74]	0.750

Note: Range for awareness, knowledge, confidence, attitude, and behavioural control = 1 to 5
[†]*Adjusted for baseline*

Perceived Confidence to Facilitate HE and PA Under Challenged Conditions

Tables 3 and 4 present the changes in the mean values for each of the 13 scenarios related to challenging conditions. These summarize care providers' perceived confidence to facilitate HE and PA activities, respectively, under challenging conditions from pre- and post-intervention. The change in the differences in the mean values between the groups were calculated from a linear regression model for each scenario separately, controlling for baseline measures. Non-statistically significant differences were detected for all of the challenged condition scenarios on perceived confidence to facilitate PA (Table 3). The intervention had a significant effect ($p<0.05$) on care providers perceived confidence to facilitate HE under challenged conditions for five of the challenging scenarios involving parents, children, and policy (Table 4). The change in *'when parents/guardians disagree with its importance'* scenario decreased in both the intervention and control groups. The difference in the changes were statistically significant. The change in *'when the children disagree with its importance'* scenario increased in the intervention and decreased in the control group with a statistically significant difference between the groups. Similarly, the change in the *'when children are not engaged'* scenario increased in the intervention and decreased in the control group. The difference in the changes were statistically significant. The change in the *'when parents are not involved'* scenario decreased in both intervention and control groups and the differences in the changes were statistically significant. Changes in *'when supportive polices are not in place'* scenario increased in the intervention group and decreased in the control group. The change in the differences for this scenario were also statistically significant. Non-significant differences were detected for the other scenarios regarding care providers' perceived ability to facilitate HE activities under challenged conditions.

Table 3

The Effect of SOLMo on the Six-Month Change in Care Provider's Perceived Confidence to Facilitate Physical Activity Under Challenged Conditions from Pre- to Post-Intervention (n=17)

Variable	Six-month change from pre- to post-intervention		Difference in the change between intervention and control groups			
	Intervention n=7 *Mean (post-pre)*	Control n=10 *Mean (post-pre)*	*Unadjusted β-coefficient*	*Adjusted*[†]		
I am able to facilitate moderate-to-vigorous PA for children in my after-school care site…				*β-coefficient*	*95% CI*	*p-value*
…when other site staff disagree with its importance	0.0	-7.0	7.545	-0.045	[-0.41, 0.32]	0.797
…when site administration disagrees with its importance	2.9	-13.5	20.75	-0.342	[-0.87, 0.18]	0.184
…when parents/guardians disagree with its importance	7.1	-3.0	15.68	-0.386	[-0.86, 0.09]	0.101
…when the children disagree with its importance	5.7	-4.5	14.77	-0.307	[-0.72, 0.11]	0.137
…when children are not engaged	7.1	-5.5	18.74	-0.339	[-0.69, 0.01]	0.055
…when parents are not involved	7.1	-5.0	15.57	-0.337	[-0.78, 0.05]	0.079
…when community stakeholders are not involved	4.3	-7.5	12.53	-0.192	[-0.056, 0.17]	0.280
…when lacking supporting materials (e.g., equipment, facilities, etc.)	1.4	-2.0	3.989	-0.030	[-0.81, 0.75]	0.935
…when supportive polices are not in place	4.3	-5.0	5.778	0.246	[-0.30, 0.79]	0.351
…when the children find the concepts difficult	2.9	-7.0	6.588	0.272	[-0.30, 0.85]	0.325
…when I find the concepts difficult	1.4	-4.0	2.822	0.150	[-0.31, 0.60]	0.492
…when the overall workload is high	4.3	-8.0	14.359	-0.172	[-0.54, 0.19]	0.330
…when site staff turnover is high	2.9	-13.0	20.983	-0.361	[-0.83, 0.11]	0.121

[†]*Adjusted for baseline*

Table 4

The Effect of SOLMo on the Six- Month Change in Care Provider's Perceived Confidence to Facilitate Healthy Eating Activities Under Challenged Conditions from Pre- to Post-Intervention (n=17).

Variable	Six-month change from pre- to post-intervention		Difference in the change between intervention and control groups			
				Adjusted[†]		
I am able to facilitate HE activities for children in my after-school care site…	Intervention n=7 *Mean (post-pre)*	Control n=10 *Mean (post-pre)*	*Unadjusted β-coefficient*	*β-coefficient*	*95% CI*	*p-value*
…when other site staff disagree with its importance	-2.9	-4.0	4.823	-0.348	[-1.20, 0.50]	0.394
…when site administration disagrees with its importance	1.4	-15.5	19.715	-0.411	[-0.95, 0.12]	0.122
…when parents/guardians disagree with its importance	-1.4	-12.0	17.735	-0.796	[-1.44, -0.15]	0.019
…when the children disagree with its importance	7.1	-14.0	17.721	-0.887	[-1.35, -0.43]	0.001
…when children are not engaged	5.7	-15.0	23.861	-0.760	[-1.17, -0.34]	0.002
…when parents are not involved	-1.4	-3.0	6.335	-0.804	[-1.35, -0.26]	0.007
…when community stakeholders are not involved	-2.9	-11.0	5.902	-0.560	[-1.27, 0.15]	0.113
…when lacking supporting materials (e.g., access to health food, kitchen space and equipment, etc.)	-15.7	7.5	-20.040	-0.113	[-0.96, 0.73]	0.780
…when supportive polices are not in place	2.9	-2.5	9.667	-0.635	[-1.25, -0.02]	0.043
…when the children find the concepts difficult	7.1	-9.0	16.88	-0.258	[-0.65, 0.13]	0.181
…when I find the concepts difficult	10.0	-11.5	22.407	-0.189	[-0.77, 0.39]	0.492
…when the overall workload is high	12.9	-15.0	27.260	-0.380	[-0.96, 0.20]	0.185
…when site staff turnover is high	1.4	-9.5	17.169	-0.529	[-1.21, 0.15]	0.117

[†]*Adjusted for baseline*

Discussion

This study used the constructs of the theory of planned behaviour and self-efficacy to measure the effects of the SOLMo intervention on care providers' perceived ability to promote HE and PA in the after-school setting. The variables measured included: perceived awareness, knowledge, confidence, attitude, and behavioural control towards promoting HE and PA, and perceived confidence to promote HE and PA under challenged conditions. The aim of the SOLMo intervention was to improve the care providers' ability to promote and improve HE and PA opportunities for children in the after-school setting. This study was the first known study to objectively measure how a health promotion intervention taking a CSH approach within an after-school care setting affected care providers' perceived awareness, knowledge, confidence, attitude, and behavioural control towards promoting HE and PA.

The results demonstrated the six-month health promotion intervention SOLMo, had a significant effect on care providers' attitude towards promoting both HE and PA when compared to usual practice care providers, after adjusting for baseline. These results are consistent with other studies in the literature reporting on the relationship between teacher and care provider attitudes towards health and children's health behaviours (Prelip et al., 2011; He et al., 2014). Consistent with the theory of planned behaviour, attitude is one of three constructs which determines behavioural intentions, and is essential to performing a behaviour (Ajzen, 1991). Attitudes regarding health, from the care providers' perspective, are thus an important consideration when implementing health promotion interventions within the after-school care setting. Based on our research, designing interventions which aim to support the development of positive attitudes of care providers towards health can support the promotion of health behaviours of children within the after-school setting.

Though not significant, small positive changes were found in the perceived knowledge to promote HE and PA, confidence level to implement PA opportunities, and perceived behavioural control to promote HE and PA. Previous studies have discussed the importance of providing training for care providers prior to implementing health promotion interventions in order to improve HE and PA knowledge (Zarrett et al., 2018; Kenney et al., 2014). Recommendations from other health promotion interventions with after-school care settings include training for care providers to improve staff skills, confidence, and competence in delivering health interventions, and to improve implementation fidelity (Thaw et al., 2014).

The intervention had a significant effect on care providers perceived confidence to facilitate HE under challenged conditions for five of the 13 scenarios involving parents, children, and policy: *'when parents/guardians disagree with its importance';* '*when children disagree with its importance'*; *'when children are not engaged'*; *'when parents/guardians are not involved;'* and *'when supportive policies were not in place.'* Non-significance differences were found for the other eight scenarios regarding perceived confidence to facilitate HE activities under challenged conditions. Similarly, perceived confidence to facilitate PA activities under challenged conditions were non-significant among groups for all 13 scenarios. These subtle positive changes suggest a need to increase efforts to influence and support these factors among care providers, as they contribute to after-school care providers' ability to promote PA and HE for children. Examples include: supporting the engagement of children, and their parents/guardians, in conversations related to the importance of PA and HE, providing activities and resources that are both simple to deliver in the ASC setting and enjoyable for children, and the establishment of standards or

guidelines for HE and PA best practices in the after-school care setting. In addition, the inclusion of course material specific to addressing PA and HE during formal training (e.g., early learning and child care certification) for care providers would be of benefit in building skills and confidence. Helping to build their knowledge during pre-service education may better prepare them to overcome challenges encountered in practice.

The non-significant changes found for the perceived awareness, knowledge, confidence, and behavioural control variables may be due to a number of other reasons besides low statistical power. The high score reported by care providers at pre-intervention for those variables might explain the unexpected negative change observed regarding the awareness to promote both HE and PA. One of the challenges in comparison trials concerns the characteristics of participants. Participants or sites that volunteer to take part in HE and PA research studies may have an interest in the area and perhaps an elevated awareness regarding the importance of HE and PA (Salkind, 2010). This may explain the high baseline scores. Additionally, implementation fidelity may also explain the lack of significance. While all sites were expected to meet the two main goals of the intervention, use of the CSH approach permitted flexibility in how sites delivered the intervention (i.e., what initiatives or activities they undertook). Thus, the intervention varied slightly across sites. This variation may have created differences in experiential learning opportunities for care providers. Challenges of taking a CSH approach within the school setting have been discussed in the literature. Storey et al. (2016) reported challenges due to community support, professional development, time, and readiness for the intervention, which also may have contributed to implementation fidelity of the SOLMo intervention. Time constraints have been commonly reported as an obstacle observed in school-based interventions using a multi-component study design (McIsaac et al., 2017; Storey et al., 2016). While attitude and enthusiasm have been reported as significant components to the effectiveness of taking a CSH approach (Storey et al., 2016), it is unlikely that attitude had an effect on implementation fidelity based on our results.

Strengths and Limitations

Strengths of this study include the use of a previously validated questionnaires and the review of the modified questions by three experts in the field for face validity. Additionally, a diverse range of care providers participated in this research, representing a diversity of perspectives and experience; participants varied in age and child care experience and included site leaders, as well as full-time and part-time staff. This study had some limitations. First, the sample size was small and likely limited the ability to detect significant differences in the variables resulting in no significant differences. This was due to high staff turnover during the study period, which was anticipated but nonetheless a limitation. Given that the study was powered based on student-level outcomes, recruitment of care providers was limited by the number of participating sites. However, despite this small sample size, results are compelling with an indication of an effect. We found clear differences between intervention and control groups and this research provides a foundation for future studies. Lastly, intervention fidelity and duration are considerations. A longer intervention period may have impacted the ability to detect a significant difference in the overall results.

Implications for Practice

Our results demonstrated the ability of an after-school health promotion intervention, SOLMo, to significantly impact the attitude and confidence of after-school care providers.
Involvement of care providers in an after-school health promotion intervention (i.e., SOLMo) is a promising approach to support health promotion efforts during the critical hours of 3:00-6:00 p.m., and ultimately improve child and youth health. Future interventions targeting the after-school

setting should focus on engagement and training of care providers in order to improve HE and PA knowledge, skills, confidence, and competence in delivering health promotion interventions. Such training could occur during formal pre-service training, or through investment in ongoing professional development and learning opportunities for staff at the site level. This however, requires funding, time and access to qualified instructors. Increased standardization and supporting policy for HE and PA in the ASC setting, alongside implementation supports, would be of benefit. Provincial health services can also support professional learning and implementation for care providers, leveraging existing health promotion resources that have been developed for schools, communities and workplaces. Given the essential role after-school care providers play, and limited research on factors affecting their ability to promote health behaviours in the after-school care setting, more research is recommended. There is a need to better understand the support required by care providers to implement health promotion interventions in the after-school care setting.

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