



Bouge - mange bien
Be active, eat well.

***Early Years Healthy Weight Strategy
Stratégie de poids santé en petite enfance***

Preliminary Evaluation Report

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for

Réseau Santé en français de la Saskatchewan (RSFS)
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Executive summary

It is well documented that early childhood sets the foundation for health and well-being; however, research indicates that very young Canadian children are not active enough and may not eat the most nutritious food for healthy growth and development. Since over half of Canadian parents rely on non-parental care for their children, childcare centers are well positioned to positively impact the health of young children; yet no systematic programming and monitoring of physical activity (PA) and healthy eating (HE) currently exist in childcare centres in the province of Saskatchewan.

Focused on children aged 3 to 5 years old, **Phase 1** project objectives were: 1) To strengthen partnerships and further engage stakeholders who participated in the SK Early Years symposium in the Fall 2007; 2) To expand the on-going early years' pilot projects in the 4 urban childcare centres (2 Francophone & 2 Anglophone centres) and include 6 additional rural sites (3 in each official language); 3) To increase the capacity of centres and families to promote healthy weights in children 3-5 years old attending those centres; 4) To evaluate the feasibility of key elements developed during the Phase 1 implementation and to assess the early impact of the strategy.

Based on an ecological model mapping key determinants of healthy weights, the *Healthy Start/Départ Santé* intervention was refined, implemented in 5 Anglophone and 5 Francophone, urban and rural centres. *Healthy Start/Départ Santé* is made of **six intertwined components**: a) creative, innovative and intersectoral partnerships conducive to participatory action that leads to promoting healthy weights in communities and early learning centres; b) the *Healthy Start/Départ Santé* guide for educators on implementing healthy eating and physical activity in young children (output of phase 1); c) customized training, role modeling and monitoring of *Healthy Start/Départ Santé* in early learning centres (booster sessions); d) an evidence-based resource LEAP-GRANDIR, which contains material for both families and educators; e) supplementary resources as needed, such as Ministry of Education (ELCC) Active Solutions information sheets (SK); and f) a knowledge translation and communication (KDE) strategy with specific targets, messaging and material aimed to raise awareness, to mobilize grassroots organizations and communities as well as to provide hands-on material (in development).

Overall, 14 classrooms at 10 childcare centres were involved in the project. Forty-seven staff (early years educators, directors and cooks) were trained. The children involved in the initiative ranged in age from 2.5-4 years old at the beginning of the project. Over the course of the project, approximately **230 children** attended the classrooms where they were exposed to an increased focus on physical activity and healthy eating as well as regularly participating in LEAP activities. **One hundred thirty seven children** whose parents gave written permission took part in the evaluation component of the project. Families came from very diverse socio-cultural and economic backgrounds.

Observation and interviews with volunteer staff and parents identified barriers and facilitators to the successful implementation of *Healthy Start/Départ Santé* and its perceived impact on the children's physical activity and healthy eating. Sample menus were reviewed. Analysis of quantitative measures such as the accelerometers worn by children and the test of

gross motor skills did not yield any significant results. However trends toward positive change in children, staff and the environment were noted. Lessons learnt and recommendations for additional refinement of the intervention were summarized. Finally the reinforcement and expansion of intersectoral partnerships ideally position *Healthy Start/Départ Santé* for further innovation, impact and long-term sustainability.

1) Introduction

Physical activity and healthy eating play an important role in the optimal growth and development of children and youth of all ages. While much attention has been paid to the physical activity and nutrition patterns of school aged children and youth, (i.e. 2010 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth¹ and Eating Well With the Canadian food guide²), little information is available regarding the types of programs early years children and their caregivers need in order to increase physical activity and optimize healthy eating in this age group. It is well documented that early childhood sets the foundation for health and well-being; however, research indicates that very young Canadian children are not active enough and may not eat the most nutritious food for healthy growth and development. Although parents have a large influence on the development of children's behaviours and lifestyle patterns, over half of Canadian parents rely on non-parental care for their children. Thus, childcare centres and caregivers play a critical role in providing children with opportunities for physical activity and healthy eating; in other words, they largely contribute to skills development that will lead to a healthy lifestyle. In addition, childcare centres and workers can offer families support and strategies to promote physical activity and healthy eating for their young children. While childcare centres are well positioned to positively impact the health of young children, no systematic programming and monitoring of physical activity (PA) and healthy eating (HE) currently exist in childcare centres in the province of Saskatchewan.

2) Long-term goal of initiative and Phase 1 project objectives

The long-term goal of this initiative is to establish and sustain an inclusive and evidence-based intervention (Healthy Start) promoting healthy weights through a physical activity and healthy eating strategy with children aged 0-5 and their caregivers.

Phase 1 only focused on children 3 to 5 years old. Phase 1 objectives were: 1) To strengthen partnerships and further engage stakeholders who participated in the SK Early Years symposium in the Fall 2007; 2) To expand the on-going early years' pilot projects in the 4 urban childcare centres (2 Francophone & 2 Anglophone centres) and include 6 additional rural sites (3 in each official language); 3) To increase the capacity of centres and families to promote healthy weights in children 3-5 years old attending those centres; 4) To evaluate the feasibility of key elements developed during the Phase 1 implementation and to assess the early impact of the strategy.

3) Strengthened existing partnerships and new stakeholders' support (objective 1)

In 2007 an Early Years Committee (EY Committee) was established to look at young children's physical activity and healthy eating in Saskatchewan. This committee built on the partnership between the Réseau Santé en Français de la Saskatchewan and Saskatoon *in motion*, and was expanded to include the Fransaskois Parent Association (APF), the Fransaskois

School Division (CÉF), the University of Saskatchewan (College of Kinesiology, and Department of Community Health & Epidemiology), and the *in motion/en mouvement* National Network of Researchers and Canadian Communities *in motion/en mouvement*. In addition, partnerships with selected interested childcare centres were established as these were a valuable opportunity to hear direct feedback from the early childhood educators and to pilot how the resource LEAP-GRANDIR would function on the ground. The early childhood educators involved in the project received resources and training, and had a unique opportunity to further emphasize and explore physical activity and healthy eating at their workplace.

During the implementation of this Phase I project, the EY Committee sought additional partnerships to obtain support for the initiative provincially. More specifically, the committee hosted an Early Years stakeholders' meeting in April 2011, inviting a variety of people connected to the early years including practitioners, policy makers and researchers. Participants were updated on the activities of the EY Committee (pilot project and research) and future plans were discussed including the role of provincial partners. Updates on other initiatives were also presented by representatives from the Saskatchewan Ministry of Education, Early Learning and Child Care branch (ELCC), and SPHERU (Saskatchewan Population Healthy and Evaluation Research Unit).

Subsequent meetings were also held with representatives from the Ministry of Education (ELCC) and the Ministry of Health (Public Health Department) who indicated support for the design and testing of the healthy weight intervention. Connections were established with other groups, and in November 2011, a second stakeholders' meeting was held with targeted provincial groups and departments such as the Saskatchewan Early Childhood Association (SECA), Saskatchewan Institute of Applied Science and Technology (SIASST) Early Childhood Education, the Heart & Stroke Foundation of Saskatchewan, SPHERU, the Saskatchewan Knowledge to Action Network for early childhood development (KidSKAN) a provincial network of researchers, practitioners and policy makers, and the College of Pharmacy and Nutrition at the University of Saskatchewan. A presentation outlining the work done from the adoption of the LEAP resource to the development of the Healthy start intervention brought the audience up to speed and current plans were shared. Groups were invited to partner with the evaluation of this novel intervention called Healthy Start/Départ Santé (see section 4.1 below). Unfortunately, no government ministries could attend due to the November 7th 2011 provincial election; however the other groups present at the meeting agreed to become involved. The EY Committee continues to expand its network of partners with new Healthy Start/Départ Santé initiatives that build on the work and results of this project.

4) Implementation and expansion of the pilot project (Objectives 2 and 3)

The pilot project primarily consisted of adopting and implementing the resource LEAP-GRANDIR (described in 4.1.1.) to enhance physical activity and healthy eating in 4 pilot urban settings. Based on the lessons learnt, it became clear that a broader strategy was preferred and would better address key determinants of health known to influence healthy weights. An ecological framework was then selected to map all these influences³ and this led to the development of Healthy Start/Départ Santé, a multi-level, intersectoral bilingual intervention which was pilot-tested during Phase 1.

4.1 Healthy Start/Départ Santé, a multilevel intervention

It entails six intertwined components: a) creative, innovative and intersectoral partnerships (section 3) conducive to participatory action that leads to promoting healthy weights in



communities and early learning centres; b) the Healthy Start/Départ Santé guide for educators on implementing healthy eating and physical activity in young children (output of phase 1); c) customized training, role modeling and monitoring of Healthy Start/Départ Santé in early learning centres (booster sessions); d) an evidence-based resource LEAP-GRANDIR, which contains material for both families and educators (see description in 4.1.1); e) supplementary resources as needed, such as Ministry of Education (ELCC) Active Solutions information sheets (SK); and f) a knowledge

translation and communication (KDE) strategy with specific targets, messaging and material aimed to raise awareness, to mobilize grassroots organizations and communities as well as to provide hands-on material (in development).

4.1.1 LEAP-GRANDIR

The LEAP-GRANDIR resource was found to be the most comprehensive evidence-based approach to meet the physical activity and nutrition needs of this age group. Developed in 2006 under the direction of Dr. Vivienne Temple at the University of Victoria, LEAP is a set of resource guides for caregivers and families that focus on integrating Literacy, Education, Activity and Play for children 0-5 years old.⁴ Each LEAP resource guide focuses on learning through play and supports healthy child development thought activities that involve physical movement, physical literacy, language development, early literacy and healthy eating. As our project focused on children aged 3 – 5, the three LEAP resources used were the *HOP (Healthy Opportunities for Preschoolers) Family Resource*, the *HOP Early Learning Practitioners Resource* and *Food Flair*. HOP focuses primarily on physical activity, physical literacy and healthy eating activities that can be shared with families. In addition, early years' educators have access to two professional resources: Food Flair, which contains healthy recipes and focuses on ways to create healthy eating environments, and the HOP practitioner's resource supplying many physical activities ideas, rationale and advice. Each early learning centre also received one LEAP-GRANDIR activity bag, containing a number of simple supplies necessary for carrying out the activities described in the HOP binder. The French translation and adaptation of the resource was made possible through the coalition of Western Provincial Francophone Parents Associations. At the onset, two of our team members were trained in LEAP and their expertise has been invaluable to the success of our project.

4.1.2 Healthy Start/Départ Santé educator implementation guide

Initial training at the 10 participating childcare centres consisted of an introduction to the project and resources, an overview of the evaluation plan, and hands on experience with LEAP-GRANDIR activities. Training began with background information on the rise of obesity in Canada and the importance of early interventions to increase levels of physical activity and healthy eating. The importance of childcare environments in offering children opportunities to be active and to eat healthy was emphasized. Participants were then introduced to the LEAP-GRANDIR resources through a power point presentation while following along in the manual, exploring key concepts and looking at examples from each section. A LEAP-GRANDIR activity circuit was set up for staff to gain hands on experience in setting up and carrying out activities. This was an important part of the training where role modelling was emphasized. The importance of adapting LEAP to suit children and staff was discussed, and each centre was encouraged to adopt and use the resource according to their own realities and practices. Project objectives were outlined, including the daily use of LEAP (60 minutes accumulated throughout the day). In addition, the staff was encouraged to promote physical activity as much as possible by incorporating movement throughout the day, reducing sedentary time, and by modeling healthy behaviours such as taking part in activities and healthy eating with children. Sessions ended with an overview of the evaluation component of the project, including timelines and descriptions of data collection tools and methods. Finally, staff and trainers looked at each centre's daily schedule to brainstorm on where LEAP-GRANDIR could be integrated throughout the day. Healthy eating material was presented through flash cards and recipes from Food Flair.

Booster sessions were added to the intervention as staff needed a more in depth opportunity to ask questions about the Healthy Start initiative and to see LEAP-GRANDIR activities demonstrated by trainers in their classroom setting. This was especially true in classrooms where educators had not been present at the original training session, or where staff turnover had resulted in a knowledge gap. Booster sessions were shorter and more informal than the initial training sessions. Key concepts were reiterated as well as project objectives. Trainers visited educators in their classrooms to discuss their questions and concerns, and to find solutions to barriers faced by educators. For example, many educators felt restricted by the space in their classrooms and did not want to have to move furniture to carry out activities. In response, the trainers looked at adapting activities to suit the classroom environment and highlighted activities that did not require a lot of space. Other suggestions were made such as doing activities in the hallway, outside, and utilising other spaces available to the centres (school gym, empty classrooms, etc.) Locally grown food recipes were also suggested and demonstrated in some cases. Staff was encouraged to take time to go through the resources and find activities that would work in their classrooms, and also to freely adapt activities and create new ones based on their classroom contexts and the needs of children. Role modelling was stressed as being good for the educators themselves as well as for the children.

4.2 Participating centres

Four urban childcare centres were already participants in the project based on previously established relationships. In addition, six rural centres joined the project a few months later under the PHAC phase 1. The goal was to work with both Francophone and Anglophone centres in urban and rural settings. The participants in our project included three and four year old children attending childcare, their parents or guardians, and staff at the ten childcare centres involved.

In total, 14 classrooms at 10 childcare centres were involved in the project. Forty-seven staff (early years educators, directors and cooks) were trained. The children involved in the initiative ranged in age from 2.5-4 years old at the beginning of the project. Over the course of the project, approximately 230 children attended the classrooms where they were exposed to an increased focus on physical activity and healthy eating as well as regularly participating in LEAP activities. One hundred thirty seven children whose parents gave written permission took part in the evaluation component of the project. Families came from very diverse socio-cultural and economic backgrounds. See table 1 below for a summary of the sample distribution.

Table 1: Description of the evaluation sample

Sample		Urban	Rural	Total
Sex	Boys	39	43	82
	Girls	29	26	55
Ages	2-3	10	16	26
	3-4	36	30	66
	4-5	22	23	45
Language	French	30	30	60
	English	38	39	77
Number of early childhood care centres	Less than 15 children	1	6	7
	15 + children	3	0	3
Early childhood care centres	Francophone	2	3	5
	Anglophone	2	3	5
Number of staff trained		20	27	47

4.3 Implementation

The project coordinator worked closely with the childcare centre directors who acted as liaisons between the coordinator and childcare centre staff and parents. The first phase of the intervention began in late August of 2010 with Healthy Start/Départ Santé training for urban centre staff and parent contacts, followed by training at rural centres in May 2011, and running

until June 2012. These training sessions at the start of the project were our first and most in depth opportunity to connect with the staff who would be implementing the program at their centres. Initially the project objectives were to integrate 60 minutes of LEAP activities into the day. Personnel were also asked to make weekly journal entries on LEAP activities done with children and to fill out a physical activity checklist on a random week during each month of the project. These measures were meant to monitor the intervention delivery.

Presentations about the Healthy Start/Départ Santé project were made to parents at each centre at the beginning of the implementation, and information was given to parents who could not attend these sessions. All children in the targeted classrooms participated in LEAP-GRANDIR activities and benefitted from a greater focus on physical activity and healthy eating. Each classroom involved received a HOP and Food Flair binder, a large hockey bag of supplies that go along with the activities, as well as a copy of the Healthy Start/Départ Santé guide for educators. Directors also received a copy of HOP, Food Flair and the Healthy Start/Départ Santé guide. Once the centres had the resources, they began to integrate Healthy Start/Départ Santé into their regular programming. The project coordinator followed their progress and worked to support the implementation, staying in regular contact with directors as a link to all involved: staff, children and parents.

A second parent evening was held at each centre a few months later in order to invite parents to learn more about the Healthy Start-Départ Santé intervention, and copies of LEAP-GRANDIR family activity cards to do at home were distributed. A LEAP circuit of activities was set up so that parents could try them on the spot with their children during the evening.

The project ran until the end of June 2012.

5) Project Evaluation (Objective 4)

An integral component of our project was a rigorous evaluation plan. All participants were invited to take part in it. Parents were invited to participate in interviews and also gave consent for their children to participate in the evaluation component of the project. Directors and caregivers as well gave consent to be involved in the evaluation. As already mentioned, 137 children participated in the evaluation component.

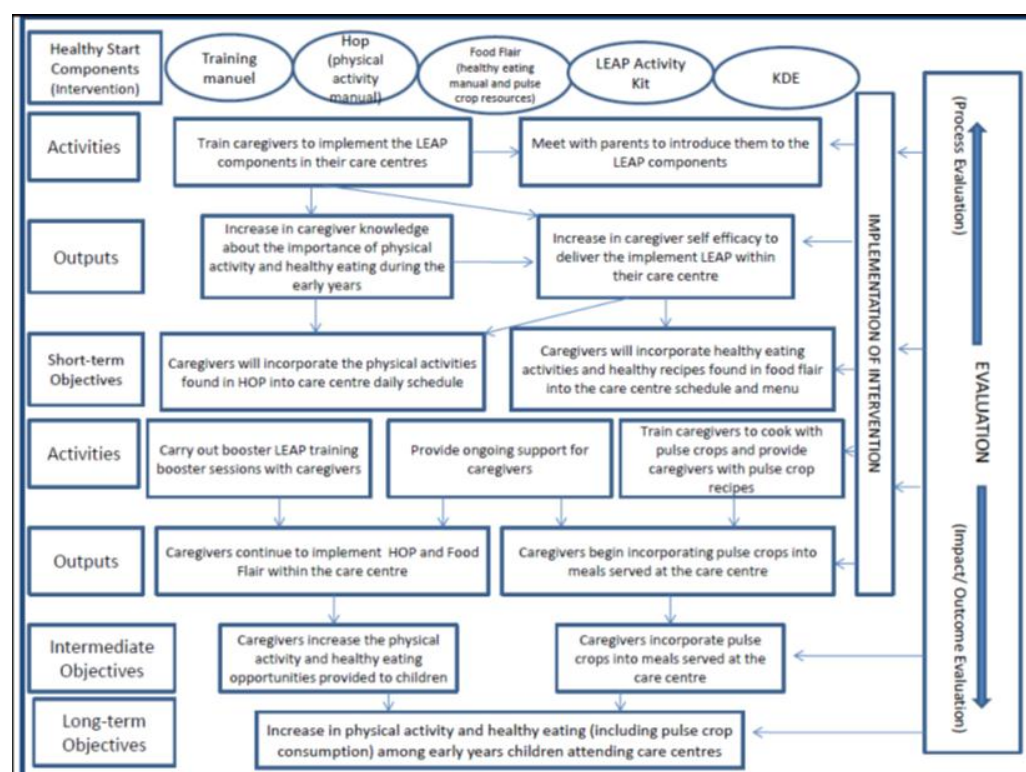
5.1 Design

A pre and post design was selected to evaluate the urban sites. This design is used to capture change before and after an intervention in the absence of an independent control group. Evaluation was completed in the 4 pilot urban childcare centres (2 Francophone and 2 Anglophone). With the expansion in Phase 1, three rural childcare centres received the intervention while three other centres deemed the “usual practice” (control group) allowed us to determine the impact of the intervention through a case-comparison approach. These “delayed control” sites will receive the intervention in the fall of 2012 after all data collection has been completed. Although no PHAC funding was dedicated to this delayed training, this was perceived as the appropriate way to repay the professionals and parents who volunteered

their child care center as a comparison site. This approach facilitated the recruitment of these centres as controls.

A program logic model was developed and context, process and impact indicators were identified. A mixed methods evaluation strategy was used.

Figure 1: Program logic model of the Healthy Start/Départ Santé intervention



Note: KDE means knowledge translation and communication strategy

5.2 Data collection

Data collection was conducted three times over the year of implementation. **Baseline** data collection occurred at each centre. Measurements consisted of the children wearing accelerometers⁵ for one week, tests of gross motor skills (TGMD-2)⁶, and an environmental scan of the childcare centre setting. The scan was done using the Early Childhood Environment Rating Scale (ECERS-R); a standardized scale commonly used in the early childhood sector to assess group programs for preschool to kindergarten aged children.⁷ For the purpose of this project, we looked at 10 items related to physical activity: Indoor Space, Furniture for routine care, play and learning, Room arrangement for play, Space for gross motor play, Gross motor equipment, Music/movement, Blocks, Sand and water, Supervision of gross motor skills, and Free play. We also reviewed weekly menus at the 3 data collection points. **Mid-point** data collection consisted of children wearing accelerometers for one week, and parent and staff interviews. During the **final** data collection period, all of the baseline measures were repeated (accelerometers, TGMD-2, environmental scan, physical activity checklists,

menus) and a second round of interviews with staff and parents was conducted. As a monitoring tool, educator notes/journals were also collected. This represented the end of the formal intervention at the care centres, although centres kept all of the LEAP resources and were encouraged to continue implementing Healthy Start/Départ Santé. For the expansion of the intervention into rural childcare centres, an additional data collection point was added in order to optimize the tracking of the impact of Healthy Start/Départ Santé full-fledged implementation. Moreover, the ECERS tool was replaced with the Environmental and Policy Assessment Observation Instrument (EPAO) to guide the environmental scans in the rural childcare centres at baseline and at the end of the intervention. The EPAO instrument is a comprehensive, standardized tool designed specifically for childcare centres to observe various aspects of the environment related to physical activity and healthy eating.⁸

The table 2 below summarizes the information that was collected at each data point.

Table 2

Variables	Measures	Timing		
		Baseline	Mid-Point	End-point
Opportunities for Physical Activity	Staff meeting and interviews, Staff filled Activity Logs, Direct Observation	✓	✓	✓
Opportunities for Healthy Eating (including local grown food consumption)	Menu Review, Caregiver Interviews, Direct Observation (EPAO)	✓	✓	✓
Physical Activity levels	Accelerometers	✓	✓	✓
	TGMD II	✓		✓
Indoor and Outdoor Centre Environment	Environmental Scan using Early Childhood Environment Rating Scale (ECERS-R)	✓		✓
Meals and Snacks Served	Menu Review	✓	✓	✓
Feed-back from parents (process)	Interview		✓	✓
Feed-back from staff (process)	Individual interview or focus group format Notes or journals		✓	✓

5.3 Perceptions of program delivery and implementation (qualitative)

All of the interviews conducted in this project used a semi-structured interview guide. Semi-structured interviews bring out discussions and conversations and allow the interviewer to explore topics deemed important. A semi-structured interview guide also makes interviewing many different people more systematic and comprehensive as there is an attempt to cover all important topics with all participants. The interview questions in the focus groups were the same as in the one-on-one interviews for consistency. Sample questions from the interview guide for educators included:

1. How would you describe your experiences with the LEAP/Grandir resources to date?
2. Do you feel that your work with LEAP/Grandir is increasing the physical activity opportunities for the children in your care? *Can you provide examples?*
3. Do you feel that your work with LEAP/Grandir is increasing the healthy eating opportunities for the children in your care? *Can you provide examples?*
4. Do you feel that the physical activity levels of children have increased in and out of care because of LEAP/Grandir? *Can you provide examples?*
5. Do you feel that the physical literacy levels of children—their ability to move confidently and competently—has improved because of LEAP/Grandir? *Can you provide examples?*

Sample questions from the interview guide for parents include:

1. How would you describe your experiences with the LEAP/Grandir resources to date?
2. Do you feel that your participation in this program has influenced the physical activity opportunities you participate in as a family?
3. Do you feel that your participation in this program has influenced healthy eating opportunities for your family?
4. Do you feel that your children move in a more confident and competent manner?

All individual and focus group interviews were reviewed several times and information organized into categories. These categories were grouped into two themes that captured the experiences of the parents and early years educators. The first theme discusses the barriers and facilitators to the successful implementation of Healthy Start/Départ Santé and the second theme centers around the impact of the Healthy Start/Départ Santé intervention on the children's physical activity. Recommendations for future work with early years children, their educators and parents were also summarized.

5.3.1 Theme One: Facilitators and Barriers to the Implementation of Healthy Start-Départ Santé

Healthy Start/Départ Santé was very well received by all educators and parents. All of the participants understood the need to increase the physical activity and healthy eating of early years children. Educators and parents felt that the LEAP-GRANDIR resource was easy to understand and put into practice:

"I use the book a lot and I find it is so easy to understand, I mark down the activities that apply to the theme I am teaching and I do not have to go looking for ways to get the kids moving."

Several educators noted: *"LEAP is easy to follow and we have been able to make lots of adaptations for the ages and numbers of children we have in our center."* The variety of activities in LEAP-GRANDIR and the opportunity to do them indoors were well received by all

educators: *"It has been really good in the winter, because we don't get to go outside much so we have started using the hallway to do the LEAP activities. It has really helped us keep the kids active in those long cold winter months."*

While there was tremendous support for Healthy Start/Départ Santé, the participants also discussed the challenges they faced in its implementation. The main challenge involved the importance that parents, co-workers and post-secondary institutions place on physical activity: *"In my preparation there was very little talk about physical activity. Sure we played some cooperative games but we need to know so much more than that. We need to know how to teach kids to move."* Another commented: *"We are supposed to be following the kids lead, at least that is what they taught us at SIAST, but I think we need to teach the kids how to move."* Another challenge was to find the time to make LEAP-GRANDIR a routine: *"When we first started doing LEAP we were not doing it daily. We had staff changes and some resistance and it was tough to get into a routine. It seemed we had a routine for crafts, and books and music, but no routine for movement."* Some educators noted that while they supported increasing physical activity opportunities, many of their colleagues did not. Thus they had to convince them of the importance of movement for the children in their care. It is interesting to note that many of the participants felt that their colleagues who were not 100% behind LEAP-GRANDIR were themselves physically inactive.

It was also felt that staff had little say in what kind of food was served. However some *Food Flair* activities such as making a fruit salad with the children in the classroom were a huge success, thanks to the parents' cooperation.

While there was overwhelming support for the LEAP-GRANDIR resource, engaging parents was also found to be a challenge. Parents whose children were wearing the accelerometers seemed to be the most interested in the program. These parents were also the ones that were the most supportive of physical activity and healthy eating. Yet, educators sometimes felt that although parents had consented to having their children participate in the intervention, it was difficult to encourage them to be actively involved in the intervention. One rural educator explained that *"since we are in a small community we all know each other personally and parents trust us. So unless they hear otherwise, parents assume that it is all good and their children are enjoying the LEAP activities."* Furthermore, some parents explained that, *"getting my child to wear the activity belts was a challenge, especially near the end of the week."* However, a number of parents stated that they had looked at the LEAP activity cards which were sent home and from what they felt LEAP was a good resource. One parent stated: *"My kids really like LEAP; they talk about it all the time at home."* Another parent felt that *"Grandir activity cards were a good reminder of the importance of moving as a family."*

5.3.2 Theme Two: The impact of Healthy Start/Départ Santé

All of the people interviewed believed that Healthy Start/Départ Santé was an excellent approach and when implemented correctly it could make a positive impact on physical activity and healthy eating in early years children while in childcare. Educators really liked that the LEAP-GRANDIR resource gave them a chance to focus specifically on activities designed to improve children's motor skills; many recognized that before they were trained in LEAP-GRANDIR, they just let the children play games. They now understood that the children needed

to be taught how to move: *“I have learned that it is really important that we teach this stuff early. We need to teach these kids how to throw and catch, they do not naturally know how to do this.”* Many educators expressed joy in seeing the children improve their motor skills: *“I see kids learning and getting better and it feels so good. For example, children that could not do the hopscotch before can do it now. Lots of them take this home and show their parents what they can do.”* The focus on the instruction of motor skills was seen by many educators as a key reason why children who previously stood on the sidelines were now in the middle of the action: *“A year ago we would have looked and said, they don’t know how to throw and that is why they don’t join in. Now we know how to teach them how to throw and once they learn, they join in. LEAP has really encouraged us to teach kids how to move, we have really focused on that and we can see the difference it makes”.* Some educators commented on the impact LEAP-GRANDIR has had on the free play of children: *“Now when we say it is time to go out and play, the kids have learned all of these new activities and on their own they play the games they have learned. They even make up obstacle courses for each other; they did not do that before LEAP.”*

Many of the rural childcare centres had large outdoor play spaces, of which a significant portion was comprised of open areas. Following the intervention some centres rearranged their outdoor play areas and added elements to encourage active play. One rural educator explained that *“over the summer we built a dirt hill for the kids to run up and down and play on it.”* Additionally, some caregivers were enthusiastic about the program as they felt empowered and able to move with the children despite their own perceived inability and skepticism at the start of the program. A greater awareness of the impact of quality food was reported as well. Experiences varied as a function of the setting and the availability of a cook. Childcare staff also felt that Food Flair was extremely helpful in giving them ideas for healthy recipes that incorporated fruits and vegetables. Some rural care centres started their own gardens or had staff bring fresh produce from their home gardens. *“We really enjoyed the new recipes and each week we incorporate a few Food Flair recipes in our menu.”* Parents also indicated that they would like more activity cards with simple ideas for physical activity and healthy recipes. When asked about the impact of the intervention on the food served in the childcare centre, a few parents said they had noticed changes in the menu and felt the centre was serving healthy food. Finally, when asked if they would recommend the LEAP--GRANDIR resource to other childcare centres, educators unanimously said they would. One caregiver replied: *“definitely it is an amazing resource to have for any staff to use.”*

5.4 Observations of environment

At each childcare centre an environmental scan was completed at the beginning and end of the intervention. The scan was done using the Early Childhood Environment Rating Scale (ECERS-R); a standardized scale commonly used in the early childhood sector to assess group programs for preschool to kindergarten aged children. ECERS is comprised of seven subscales (Space and Furnishings, Personal Care Routines, Language-Reasoning, Activities, Interaction, Program Structure, Parents and Staff) which look at 43 items in total. For the purpose of this project, we looked at 10 items related to physical activity: Indoor Space, Furniture for routine

care, play and learning, Room arrangement for play, Space for gross motor play, Gross motor equipment, Music/movement, Blocks, Sand and water, Supervision of gross motor skills, and Free play. Our intention was to observe if the intervention had an effect on the environment with regards to access or barriers to physical activity.

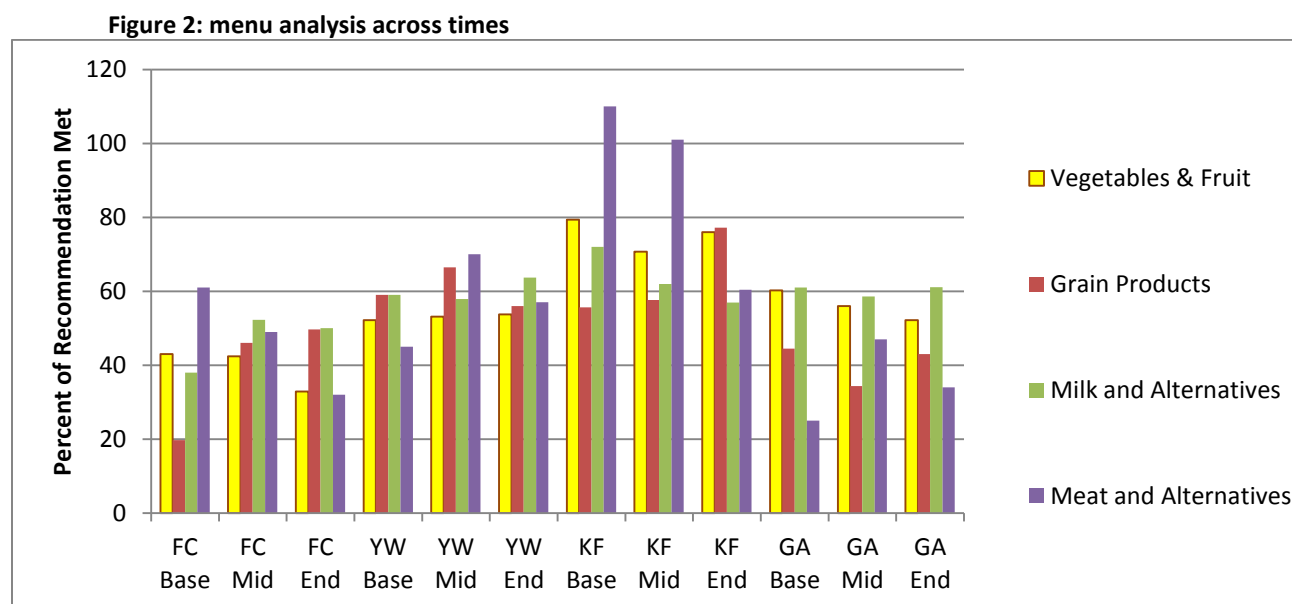
ECERS scores for each classroom and centre increased or stayed the same from pre to post intervention; however because ECERS is a standardized and very specific tool, numeric scores did not reflect all of the nuances we observed at the centres in relation to the intervention. ECERS items related to the physical environment and equipment often looked at indicators unrelated to or beyond the scope of the Healthy Start/Départ Santé intervention, such as ventilation and whether or not there was direct classroom access to an outdoor play space. However combining ECERS with informal observation and discussions with staff and directors gave a descriptive picture of how the intervention affected opportunities for physical activity in the childcare environments. For example, at one centre LEAP-GRANDIR became part of their core programming and was integrated into the weekly schedule for all preschool and toddler classes. At another centre, an educator created a physical activity play station in her classroom after a suggestion made at a booster session held at this centre. A corner area was cleared and interlocking foam mats were laid on the floor with LEAP-GRANDIR materials such as scarves and skipping ropes available for children's free play. This addition to the classroom environment was a direct result of the intervention. This educator was a Healthy Start/Départ Santé champion and embraced integrating opportunities for physical activity into the day. She equated the success of this physical activity station to the children's familiarity with LEAP-GRANDIR activities and materials. She also made several easy recipes in the classroom with the children for their snacks. Another educator rearranged her classroom to have more open space for movement throughout the day.

5.5 Menu reviews

The purpose of the menu review analysis was to evaluate the number of food group servings provided at each centre at the three time points: baseline, mid-point, and end-point in relation to the daily recommendations in the Canada food guide. The age range chosen for analysis was 4-8 years. The analysis main challenge was that menus had not been completed with enough meaningful and detailed information by the participating centres. Therefore, the first step required was to agree on a reasonable set of assumptions about volumes, specific types of food and recipes. For example, assumptions about specific foods were based on: a) reasonable estimates and prior experience with the age group (Ex. Twenty-four hour recalls from the *Healthy Immigrant Children* study⁹ indicate that children ages 4-8 are most likely to drink small amounts of fluid at one meal (i.e. ½ cup milk); b) notes about specific foods provided by the study coordinator who had observed the centres on several occasions (Ex. Cheerios are a common cereal choice and bread served is commonly white bread; c) known foods preferred by children of this age range. (Ex. Children tend to like fruits such as apples, bananas and grapes); d) commonly available and cost effective foods (Ex. Carrots, celery and cucumbers are vegetables that are available all year round and tend to be less costly than other vegetables). All these assumptions were validated by the research team and used to fill missing

data. Coded data were then entered into the food processor software and calculations made to categorize foods by food groups and serving size.

The graphic below shows a snapshot at baseline, mid-point and end-point of the 4 centres' in-depth review of sample menus.



Daycare centres provided from 20% to 70% of the daily recommendations depending of the food groups. Overall, no trend could be identified from baseline to the end of the intervention. Several limitations should be acknowledged such as to the volume of food actually eaten by the children may not correspond to the chosen amounts for this analysis. In addition, it is important to note that food served in these centres do not represent a full day's intake; thus, we cannot expect that the recommended daily servings will be reached.

5.6 Quantitative results

In order to track physical activity levels and literacy, two measurements tools were used during the project:

5.6.1 The Test of Gross motor Development (TGMD-2)

It is a standardized measure to assess gross motor development in children aged 3-10. Standard scores are provided for each of the two sub-tests (Locomotor and Object control). The Gross Motor Quotient is formed by combining the standard scores of the Locomotor and Object control subtests and is the best measure of an individual's overall gross motor ability.

Using normative information to control for age, the mean gross motor quotient improved from baseline to end of project by 16% and individual data showed the same trend. However no correlation was found between the level of physical activity and the gross motor quotient at any of the 3 data points.

5.6.2 The Actical accelerometers

Of the size and dimensions of a small pager, the accelerometers objectively capture movement and are considered a robust measure of physical activity. They were attached on a belt worn by participants around the waist. The children and their parents were instructed both verbally and in written form on how to attach the accelerometer. During data collection periods, children wore the monitor at all times while awake except when involved in water activities like bathing and swimming. Parents were asked to record the times when the monitor was attached and removed for the purpose of calculating activity time and sleeping time. The data were electronically downloaded into a data file which contains 15 seconds by 15 seconds movement counts for each child. The total amount of physical activity from the Actical was expressed as the average movement counts per minute and the number of minutes beyond certain activity thresholds.

According to the Canadian Society for Exercise Physiology (CSEP), the Moderate to Vigorous Physical Activity (MVPA) consists of activities such as running and jumping, and light activity (LA) includes activities such as walking and moving. Sedentary time (SED) mainly corresponds to time spent while sitting or standing. The table below summarizes the relevant definitions and cut-points used in the study.

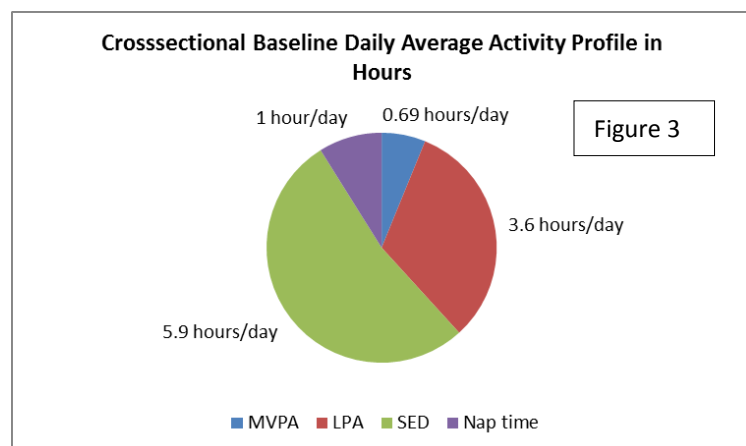
Table 3: Physical Activity Intensity Cut-points for Actical Accelerometer¹⁰

Intensity	Activity energy expenditure (kcal·kg ⁻¹ ·min ⁻¹)	Physical activity ratio (EE/BMR)	Example	Accelerometer count range (counts per minute)
Sedentary	Less than 0.01	Less than 1.5	Car travel, sitting, reclining, standing	Less than 100*
Light	0.01 to less than 0.04	1.5 to less than 3.0	Walking less than 3.2 km/h, light play	100 to less than 1,500
Moderate	0.04 to less than 0.10	3.0 to less than 6.0	Walking more than 3.2 km/h, aerobics	1,500 to less than 6,500
Vigorous	0.10 or more	6.0 or more	Jogging, running	6,500 or more

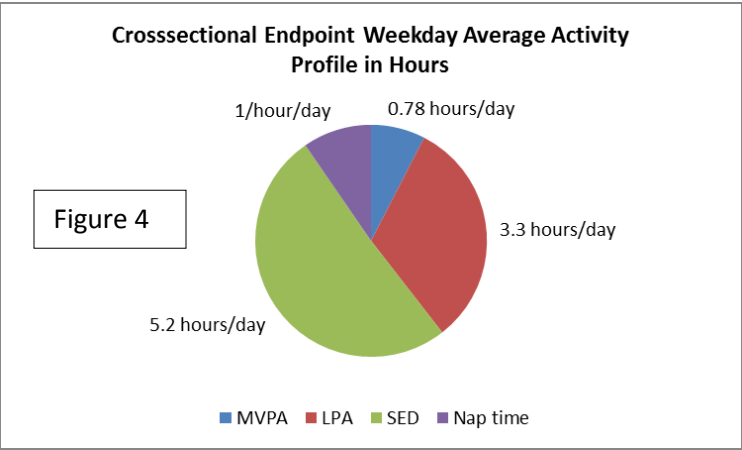
EE = energy expenditure
BMR = basal metabolic rate

* Including wear-time zeros

The raw data were analyzed using custom software, KineSoft version 3.3.63 (KineSoft, Loughborough, UK) to produce a series of accepted standardized outcome variables as shown in the table above. This ability to categorize accelerometer data results in the segregation of Physical Activity (PA) from sedentary time (SED). All activity outcome variables are measured in minutes. Considerable emphasis was placed on setting operational definitions, quality control and data reduction techniques of accelerometer data, as



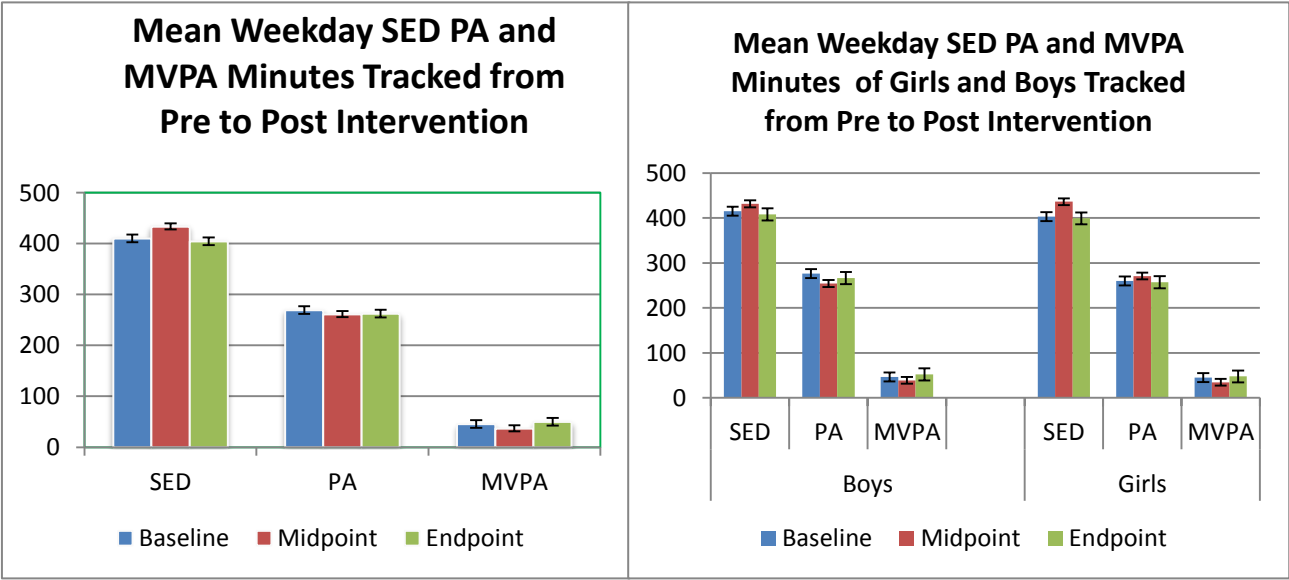
minor alterations could lead to substantial differences in the interpretation of derived data. In order to avoid including days when the children did not wear the device, or wore the device for a period which is deemed insufficient to interpret levels of activity, the concept of ‘valid days’ was adopted.¹¹ A valid day for accelerometer data measurement purposes is when the device is worn for 10 or more hours per day excluding sleep time. To be included in the analysis, a participant should therefore have at least 3 valid days across the three data collection points.



First, cross sectional analysis combining all centres were done at baseline, mid-point and at the end of the Healthy Start/Départ Santé intervention. The pie charts represent the daily average activity profile which is defined as the amount of time kids spent in various activities during the day (when they wore accelerometers).

The sedentary time at baseline was 5.9 hours and the MVPA at 0.69 hour. At the end of the intervention, the daily sedentary time on average was a bit smaller at 5.2 hours and the MVPA showed a small increase at 0.78 hour or an additional 5 minutes per day on average. These differences were not significant. It is worth noting that the mean physical activity combining the MVPA and LA at these centres was found to be within the recommended guidelines of 180 minutes per day minimum.¹² For the tracked analyses, physical activity (PA) was defined as the sum of LA and MVPA and was graphically compared to SED and MVPA alone.

Figures 5 and 6



The results indicated that there was a significantly higher accumulation of SED at midpoint in both the overall sample and in girls as illustrated with the confidence intervals. Seasonal effects were observed with a noticeable dip in level and intensity of physical activity in all daycares during the winter data collection. Graphs 5, 6, 7 show these results.

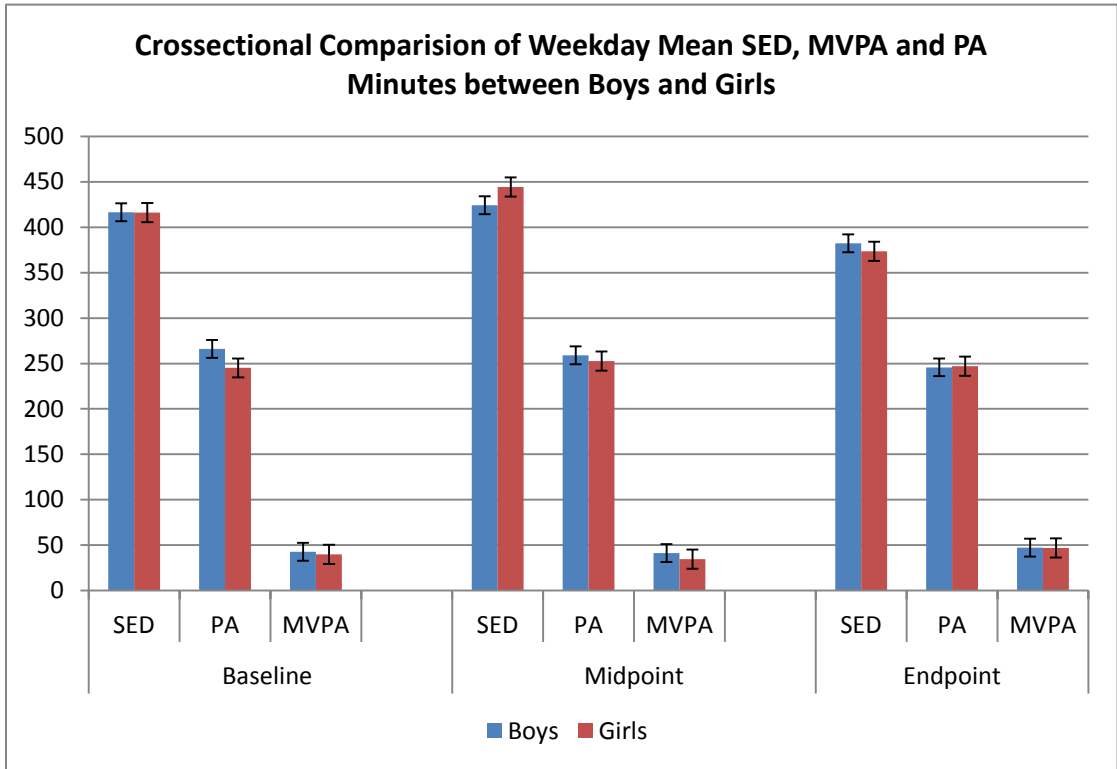


Figure 7

A final analysis looked at similarities and differences between weekday physical activity (PA and MVPA) and sedentary time (SED) compared to week-end physical activity and sedentary time for girls and boys.

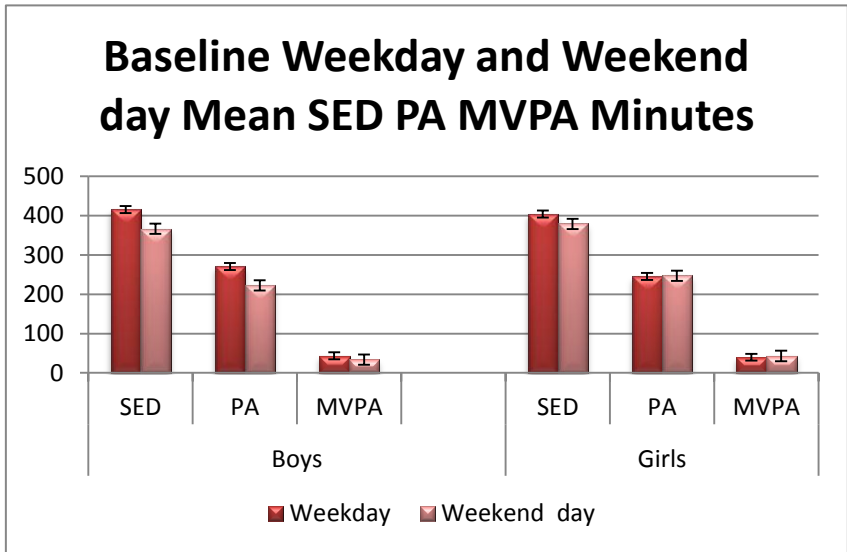


Figure 8

At baseline, in boys, significant difference was observed between SED and PA accumulation on weekdays and weekends. Both SED and PA were higher on weekdays. (Figure 8)

At midpoint, in both boys and girls, significant weekday and weekend differences were observed in SED and PA accumulation. (Figure 9)

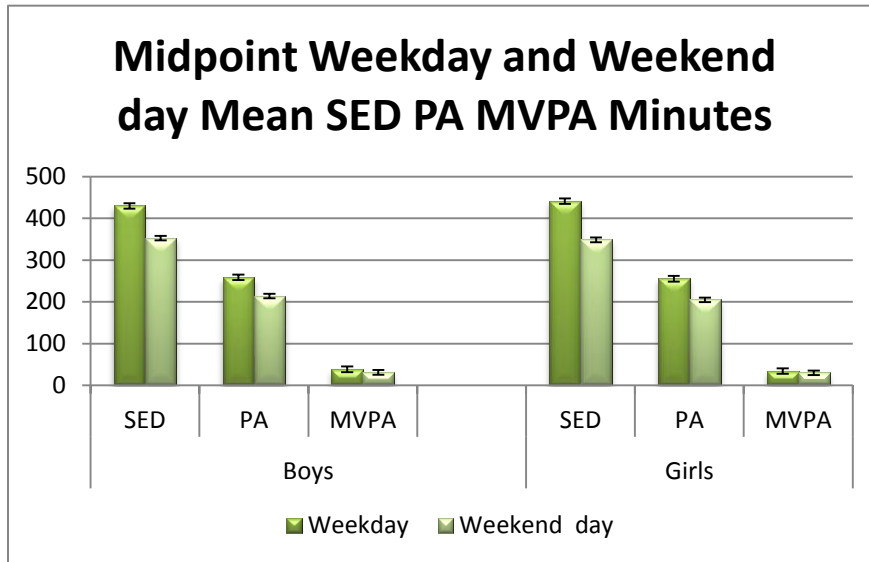


Figure 9

The difference in physical activity was more important among girls who showed a significant drop in combined levels of physical activity on week-ends compared to their combined levels of week-days physical activity ($p=0.002$). (Figure 10) This observation may mean that girls are less active during the week-end; it may also be attributable to wear time during the week-end and water-related physical activities. Parents' recorded schedule of accelerometers' wear time would also provide insight if filled appropriately. In this study, compliance with recording this type of information was not very good unfortunately. More in-depth analyses need to occur to tease out the effect of accelerometer wear time on the results.

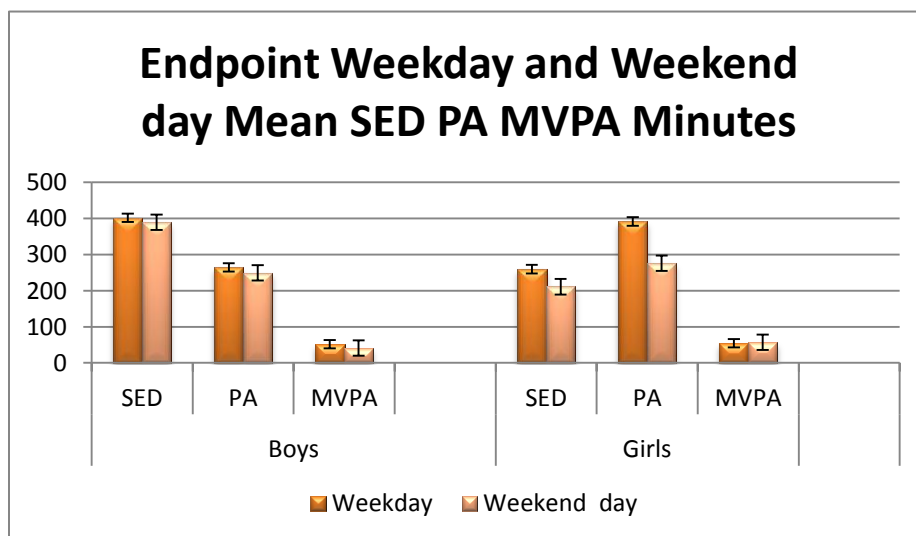


Figure 10

6) Lessons learned

Four kinds of accomplishments and lessons can be drawn at the end of this Phase I project.

6.1. Strengthened partnerships

A strong network of partners was developed. We held two large meetings in 2011 (April and November) with a wide range of interested stakeholders and added people with expertise in healthy eating (College of Pharmacy and Nutrition), in early childhood development, population health intervention research and knowledge translation (SPHERU), as well as colleagues from New Brunswick in order to strengthen our intervention, evaluate the implementation of these resources, better integrate knowledge translation and get ready for the additional expansion of Phase 2. To reach more children, and a more varied population, we also established a partnership with the Saskatchewan Early Childcare Association (SECA).

6.2 Lessons learnt about the implementation of Healthy Start/Départ Santé

- We have developed an increased understanding of how to implement this intervention in multiple settings. For example, in rural settings, it is important to work around the seasonal schedules of seeding and harvesting, and with smaller childcare centres that include a wide age range of children grouped together, a common occurrence in rural Saskatchewan.
- The early years care centers who fully implemented Healthy Start/Départ Santé were centres that made physical activity and healthy eating a priority for their children. They designated LEAP time and LEAP spaces and the children at these centres had more opportunities to be active than those at centres who did not designate LEAP time and space. They also were very keen in trying new recipes with locally grown food.
- We have identified the need to train and support early years educators using the Healthy Start/Départ Santé program resources to provide for the implementation of physical and healthy eating activities for children in their care. “Booster” training sessions were added to provide ongoing support throughout Phase I. These sessions reinforced the key factors in delivering the program, offered ideas to address any barriers caregivers were facing, and gave us a way to train new staff in childcare centres resulting from staff turnover.
- Issues relating to cultural differences emerged. It was found for example that the French version of LEAP (GRANDIR) contained many lyrics and rhymes adapted to traditional French and French Canadian songs. Some educators were newcomers to Canada, and not all were familiar with the songs which posed a barrier to encouraging movement through dance and music. Therefore in 2011 a music CD to accompany GRANDIR was produced and made available to the francophone centres (Fall 2011). Cultural differences also appeared in the food availability and it created some tensions on occasions.

6.3 Impact measurements

- Most participants felt that some aspects of the project were onerous. They reported feeling overwhelmed by the record keeping that was required as part of the evaluation phase of this project. Although monitoring is important, any record tool has to be user friendly and simple to use.
- More specific nutrition protocols need to be established for the Healthy Start/Départ Santé nutrition component. In order to better track food availability, we must ensure that menu data specifies the type and volume of foods offered at each centre. It is also strongly suggested to provide menu templates to cooks at each childcare centre. Templates may specify which food guide category each menu item falls under and may provide a space to write more detailed recipes for mixed dishes.
- Hold a specific training session for cooks to explain menu analysis, goals of Healthy Start/Départ Santé, menu templates, etc.
- Other measures might include plate waste and garbage monitoring as well as use of photographs. In addition observations and data collections may be done on random dates to gain a more comprehensive understanding of actual quantities of food consumed by children.

6.4 Other Recommendations

- The importance of including parents in all aspects of promoting physical activity and healthy eating was emphasized by many caregivers and directors. Meeting with children's parents and guardians is crucial to program success, however this proved challenging and taught us that alternative ways to reach parents need to be explored such as on online communications, a robust website, regular electronic newsletters with links to the website, and social media use (YouTube, Facebook, Twitter), both for families with children in the intervention, and more widely.
- Caregivers repeatedly noted that they felt ill prepared to offer opportunities for children to increase their physical skills and healthy eating. They felt these areas were not emphasized in their training and they stressed that these components should be reinforced in theory and practice. Also encouraging all caregivers to increase their own physical activity is an area that should be addressed in future work.
- Care centres that wish to participate in future projects with a robust evaluation process should be required to sign a memorandum of understanding that clearly delineates the expectations of program implementation.

7) Limitations

Some of the challenges that we encountered are an integral part of an intervention in real life circumstances and settings. Abundant notes and observations were made, encouragements were provided and yet, we were not able to avoid missing data, thus leading to only 3 valid days and one week-end day for analysis during each data collection period. It should be noted that

small sample size may not be ruled out as a reason for non significant results. Unfortunately, the final comparison analysis for all the rural sites has not been completed yet and therefore was not reported here. An on-going challenge was to monitor the adherence of participants to the program as taught. Fidelity of the intervention could be enhanced with a standardized, yet user friendly way to record and report in more detail how the intervention was implemented as well as how long per day the accelerometers were worn. For example, nap times may have been sometimes misinterpreted as a sedentary time during the day.

8) Conclusion

With scarce information on physical activity and healthy eating in 3-5 years old in the literature, this project clearly represents some ground breaking and innovative work. This Phase I has resulted in the development of a focused, inclusive and evidence-based strategy called Healthy Start/Départ Santé that promotes physical activity and healthy eating with Anglophone and Francophone 3-5year olds in childcare settings, living in both urban and rural areas in Saskatchewan. Over the course of the Healthy Start/Départ Santé intervention, improvements were seen in children's physical literacy. Changes were also made in childcare environments to offer children more opportunities to be physically active and more healthy eating choices were provided. Child care workers enjoyed their experiences with the resource LEAP-GRANDIR and understood that change starts with their own involvement and example. Strong partnerships were created and sustained with much anticipation of the expansion of the project during the next phase. Early results are promising as children and staff are moving more and the environment is changing. The lessons learnt and recommendations as proposed will address the limitations acknowledged for this Phase 1.

Acknowledgment

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