

A QUALITATIVE EVALUATION OF THE EFFICACY OF THE DELIVERY OF THE EDUCATIONAL COMPONENT OF A NUTRITION PROGRAM, IN A REMOTE FIRST NATION COMMUNITY¹

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ABSTRACT

Obesity is disproportionately affecting Aboriginal people in Canada. Physical activity and a healthy diet can help maintain a healthy body weight. We implemented a comprehensive school-based nutrition program in the remote community of Fort Albany First Nation that included these components: 1. health education; 2. healthy environment; 3. healthy policy; 4. community and family involvement; 5. program evaluation. In this paper, we evaluated qualitatively the efficacy of the delivery of the educational component of

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our program, through the examination of program integrity, and students' and teachers' impressions of the program. Results were triangulated and revealed that visual aids should be used extensively when presenting information, with the number of hands-on and group-work related activities being maximized, to fully engage the students. In Fort Albany First Nation and similar communities, future environmental health programs that have an educational component should incorporate the above recommendations.

Key words: Obesity; nutrition; environmental health education; First Nations; teaching styles

INTRODUCTION

Obesity among the Canadian population, especially Aboriginal people (i.e., First Nations, Inuit, and Métis) has become more prevalent (Garriguet, 2008). Higher rates of obesity increase the risk of health problems (e.g., type 2 diabetes, cardiovascular diseases) within any population (Garriguet, 2008). Environmental factors that influence childhood obesity include access to facilities (and/or programs) for physical activity and access to healthy food (Garriguet, 2008). A diet that is well balanced with selections from the four major food groups (grain products, vegetables and fruits, milk and alternatives, meat and alternatives), as described by Eating Well with Canada's Food Guide, along with physical activity can help to maintain a healthy weight, and reduce the risks associated with excess body weight (Health Canada, 2007).

Improving the Aboriginal child's intake of vegetables and fruit, as well as milk and alternatives, is challenging as there are many factors that act as barriers to accessing these healthy foods (Skinner et al., 2006; Lougheed, 2010). Many northern Aboriginal communities are remote; thus, the availability of fresh produce and dairy is limited, and when it is available it is often of poor quality. In addition, as food is transported by plane to remote communities, the cost of food increases; in northern communities, goods are often more than three times more expensive than in more southern communities (Tsuji, 1998; Skinner et al. unpublished data).

THE COMMUNITY

Our partner community, the remote First Nation of Fort Albany, is located in northern Ontario, Canada, and is only accessible year-round by airplane. Peetabeck Academy provides education to the children of Fort Albany First Nation. The school itself consists of an elementary section with a high

school attached where there is a gymnasium. Although the school is First Nation-administered through the Mundo Peetabeck Education Authority, the school follows the Ontario curriculum; however, Cree language classes, and other cultural activities are part of the school experience. Our research team has been working with Fort Albany First Nation for over 20 years with respect to school-based nutritional and health issues.

THE PROGRAM

Our nutrition program is based upon the US Center for Disease Control (CDC) framework for comprehensive school-based nutrition program development (CDC, 1996). The program was further guided by Social Cognitive Theory, which stipulates that behaviour change is dependent upon an interaction between knowledge, perceived self-efficacy, outcome expectations, health goals, perceived facilitators, and impediments (Bandura, 2004). As most young children spend six or more hours at school, five days a week, the school environment is an ideal place to teach the students about healthy eating – and can help children develop a healthy lifestyle – which can reduce the risk of obesity related diseases (CDC, 1996). We have incorporated these essential elements from the CDC framework into our Peetabeck Academy program:

1. **Health Education.** The Vegetable and Fruit and Power4Bones modules were modified for Kindergarten to grade 5 from existing programs: the Northern Fruit and Vegetable Pilot Program (He et al., 2007); and the Power4Bones program (Dairy Farmers of Canada, 2005). The programs were modified to incorporate traditional foods relevant to Fort Albany, as well as introduce new foods. The nutritional program was delivered by the senior author of this paper from January to June, 2010, in coordination with the school's existing snack program. Each in-classroom lesson was a half an hour in length, and delivered one to two times a week, for each class. The Vegetable and Fruit module focused on educating the students on the importance of eating vegetables and fruit, increasing their daily intakes through a variety of lessons, and providing the opportunity to taste different types of fruit/vegetables. The module was delivered for six weeks and included a variety of teaching styles and materials in accordance with the Ontario curriculum. The Power4Bones module focused on teaching the students about the importance of consuming adequate milk and alternatives, the nutrients they provide (vitamin D and calcium) and weight-bearing exercises. The

Power4Bones module was originally designed for grade five students and heavily reliant on computer work; it was modified to be delivered without computer work and included traditional First Nations' foods and activities. A daily log was maintained by the instructor for both modules; what was taught, any modifications made to the lessons, and miscellaneous information was recorded.

2. **Healthy Environment.** Food provision was also part of the program; we have assisted with the breakfast and snack program that has existed for over 20 years.
3. **Healthy Policy.** J. Metatawabin, the coordinator of the snack program, was supplied with policy guidelines by two of the registered dieticians of our team, as well as sample shopping lists to aid in making healthy purchases.
4. **Community and Family Involvement.** The program included take home educational material (handouts), in order to include the families of the students in what was being taught at school. The community was also involved through a large community feast held at the end of the school year. At the feast, donated game was also served, while a raffle for fresh produce, milk products, and physical activity equipment was staged at the end of the event. It should be noted that students and community members helped with food preparation, set-up and clean-up.
5. **Program Evaluation.** In this paper, we will evaluate qualitatively the efficacy of the delivery of the educational component of our program, as program lessons must be engaging for the students, to be effective (CDC, 1996).

The present study was conducted in partnership with Fort Albany First Nation, the Mundo Peetabeck Education Authority, and Peetabeck Academy. Permission from the Office of Research Ethics at the University of Waterloo was also granted.

METHODS

All materials used in our program were previewed during a formative evaluation by the school's breakfast and snack coordinator, who is also a teacher, for cultural appropriateness and content. Any suggested changes were addressed prior to the start of the program. Program integrity (participation rate, lesson content, and in-classroom modifications to the original lessons) was recorded by the primary author, who delivered the lessons. To triangu-

late results on the efficacy of the delivery of the educational component of the program, students' and teachers' impressions of the program were also collected. The students in grades three to five were asked, as a class, what they liked and disliked about the program, and could comment on the instructor; the instructor of the program was not present during the oral evaluation to avoid biasing the results. Students in kindergarten to grade two were deemed too young to fully understand the evaluation process. However, the school as a group created a card for the instructor before she left the community. Each class wrote a message with some students writing their own personal message. The messages from the kindergarten to grade 2 classes will not be used in our evaluation, but will be presented, as the messages give insight into what parts of the program engaged the children. A focus group with the teachers at the completion of the program elicited their impressions of the efficacy of the delivery of the educational component of the program. Questions asked included the following: What lessons were the most interesting? What lessons were not useful?

Coding and analysis of the data was performed by the primary author (ADI) and confirmed by one of the co-authors (LST). Code creation was both deductive (or "theory driven" from prior research) and inductive (or "data driven" emerging from the raw data; Fereday and Muir-Cochrane, 2006). Data analysis was iterative.

RESULTS AND DISCUSSION

PROGRAM INTEGRITY

Participation rate

Program attendance was excellent for the Power4Bones module: 88% for week one; 88% for week two; 86% for week three; 85% for week four; and 89% for week five. Program attendance was more variable for the Fruits and Vegetables module: 93% for week one; 79% for week two; 81% for week three; 89% for week four; 68% for week five; and 77% for week six. School attendance was affected by a variety of events (e.g., an out-of-town basketball tournament in week 2, a funeral in week 5).

Lesson content

Vegetable and fruit tasting

During the vegetable and fruit tasting lesson the students had the chance to taste five different vegetables and fruits and describe them. Lesson de-

livery was over two days, a half-an-hour each day per grade. The first part of the lesson introduced the task, as a role-playing experience, where the students were given the chance to see what it was like to be a taste tester. The students were then shown a list of words to describe food (e.g., colour, texture, and taste). The students read over the words out loud as a class and were told the meanings of those that were new. The class was then given one piece of vegetable/fruit to sample and then describe; this allowed the schoolchildren to practice what was just discussed, preparing them for the next lesson.

The second lesson involved the students trying five different fruits/vegetables. Each student in the class was given a worksheet that had descriptive words on it from the previous lesson. For each food, they circled the corresponding descriptive words they felt best described the food. The instructor also had a large chart in the same layout as the students, allowing the instructor to follow along with the students and show them what to do. The students tasted the fruits/vegetables raw and many tried ones they had never had or seen before, such as cauliflower and eggplant. The students were excited when they tasted foods they already knew and enjoyed. Although it was not new for them, it helped them put that excitement into words, hopefully, allowing them to remember that excitement when choosing an unknown fruit/vegetable. At the end of the lesson the class went over which ones they enjoyed and which ones they did not, they were then given a snack of the food they enjoyed the most.

As many children can be “fussy eaters” the lesson incorporated the term of being “brave.” Students were asked what being brave meant and any examples they had of being brave. It was then applied to tasting a new food or perhaps eating one they may not enjoy, this helped a lot of the students to become more comfortable with eating new foods. The students always had the chance to say no to a food, if they did not want to try it, but most were willing and excited to try them.

Overall, this lesson engaged the students and allowed them to see, feel, taste, and smell the different fruits/vegetables. This lesson was a fun and interactive way for the students to experience fruits and vegetables. It goes beyond simply just showing them pictures (visual) and talking about them (auditory). It allows them to actually interact with the food as they would at home and make an informed decision on whether or not they really enjoyed the fruit/vegetable that was being shown.

Physical activity

The Eating Well with Canada's Food Guide (Health Canada, 2007) recommends at least 90 minutes of moderate physical activity a day for children and youth. The importance of this point was emphasized in both the Vegetable and Fruit, and Power4Bones programs, in the context of students playing and having fun while being active. Although the school already had a well developed physical education program — after discussing with the physical-education teacher what the students had been taught in-class — a physical activity was adapted from the lesson into a game. When discussing with the students different activities they can do, it was important to keep it relevant to the season, and what equipment was available to them within their community (CDC, 1996).

Pizza making

The last lesson in the Power4Bones program brought the students into the kitchen to make a favourite meal healthy. It was important throughout the program to continuously allow the students to see and taste different fruits/vegetables and milk preparations (CDC, 1996); exposure to a variety of food types is important to eating healthy foods. This activity was a great way of tying the two modules together. The making of the pizza showed the students how some food incorporates all four food groups (vegetables and fruit, grain products, milk and alternatives, and meat and alternatives). Students created their own pizzas with a variety of healthy toppings; they were then able to take them home, warm them up, and eat them. Each class was then given a large pizza to decorate to be served at the community feast, as a contribution to the healthy meals being served. While making their pizzas, a review was done asking them which food group each of the components of the pizza was from, and why the component was good for our bodies (e.g., cheese is part of the milk food group and it makes our bones strong).

Lesson modifications

The lecture style of teaching was ineffective when used for long periods of time in the program. Although each lesson was only a half an hour long, most classes could only sit and listen for approximately 10–15 minutes. Thus, lessons were modified and divided into parts. The first half was dedicated to teaching new material, reviewing, and instructions. Even though this half of the lesson was lecture-based, visual aids and choral style answering were used so that the communication between the teacher and students

was less teacher dominated, as suggested by Foreman (1991). Allowing the use of choral style answering among the students relieved the pressure for one student to publicly announce an answer and possibly feel shy or embarrassed (Leith and Slentz, 1984). However, this style of answering was altered slightly, as vocal answering with a large class can easily become overwhelming. Instead, the instructor would format the question for a yes or no response with students giving a thumbs-up or thumbs-down response for the question. This type of response system allowed the student to evaluate him or herself without having to face the class individually.

The second half of the lesson was used as the active learning portion, where the students were able to apply what they had learned. This was done numerous ways, such as creating stories, drawings, and games. In addition, the second half of the lesson allowed teaching styles that have been found to be more effective with Aboriginal schoolchildren, such as giving students a chance to interact with each other (group work). Leith and Slentz (1984) report that many elementary Aboriginal students prefer group problem solving to individual assignments. Setting the students up to work in groups also allowed them to understand their individual strengths and collaborate on ideas (Foreman, 1991). Using this style of teaching was challenging, as many of the classrooms were not set up for the students to work in groups (the way the desks were positioned). This style of teaching was used throughout all the lessons in more subtle ways; when students were given a worksheet, discussion between the students was acceptable and allowed them to collaborate on ideas. Peer-to-peer help allowed the students to see each other as a resource rather than relying solely on the teacher. Group work was also used when playing games. In the Power4Bones program, a game was played where the students had to collect a certain amount of calcium in order to win. They played in groups of two or four, and worked to collect enough calcium. This game allowed the students to see what foods contain calcium and how much calcium they get from those foods.

Restricting the students' time to complete a task such as creating a story was ineffective, as most did not have enough time to complete and understand the focus of the lesson. The program's layout allowed for flexibility in the completion of certain lessons. If the students did not understand the material from the previous week there was time to review the material and allow the students to fully understand before moving on. The instructor also had the time to really get to know the students and their strengths/weaknesses; this allowed for work to be modified ensuring the students would be

able to complete it within the time frame and still understand the material. However, even with the modifications, time lines were a challenge. Many students in each class were at different levels in their reading and/or comprehension, which meant that during some lessons, time was spent going over instructions on the worksheet or explaining verbal instructions in a different way. This was when the use of group work was very helpful as the students were able to help each other out rather than relying on the one instructor.

STUDENT IMPRESSIONS

Kindergarten responses, as expected, lacked specificity, and related to their general happiness with the program: “Thank you for bringing snack every-day”; and “Thank you for teaching me about vegetables.” The responses from grades 1 and 2 were more specific and related to portions of the program involving hands-on activities:

We love your bone building [activities and the] food program. (grade 1)

Thank you for teaching us about vegetables and milk. The thing we liked best was putting the cheese on the pizza. (grade 2).

The class interviews with grades 3–5 yielded responses which could be placed into three codes: fruits and vegetables they enjoyed (e.g., grade 3 – lemon, strawberries, cottage cheese, yogurt; grade 4 – peppers, eggplant, yogurt; grade 5 – broccoli, cauliflower, turnip, peas) or disliked (e.g., grade 5 – raw mushrooms); hands-on activities (e.g., grade 3 – trying different fruits and vegetables, making pizzas; grade 4 – tasting fruits and vegetables, making pizzas, weight-bearing activities; grade 5 – cooking, sorting the bone-building foods, exercise circuit, the card game) and visuals (e.g., grade 3 – the comics from the Power4Bones; grade 4 – the agent bones comics).

Hands-on activities

Studies have suggested the use of hands-on activities or tactile learning when working with Aboriginal students. This style of teaching allows the students to become actively involved in the lesson, where the teacher is more of a guide who leads the students (Leith and Slentz, 1984). This type of activity also incorporates what has been reported as an Aboriginal style of teaching, where the student watches and models what has been shown to learn how a task is completed (Swisher and Deyhle, 1989). These lessons were the most memorable for many of the students in the present study:

I liked it when we made smoothies!

I like it when we made pizzas! (grade 5)

Visuals

In studies examining teaching in Aboriginal communities, many researchers have reported that using the visual approach aided greatly in the students' success in learning the material (e.g., Wauters et al., 1989; Deyhle and Swisher, 1997). In the present initiative, comics were utilized in the Power4Bones program and were a very helpful visual aid when teaching the students about milk and alternatives, and weight-bearing exercises. The comics mirrored what was being taught in that lesson; it gave a fun way for students to understand the material being presented to them. The older students (grades 3–5) actively participated in the class by reading out loud and acting out the different parts. In the younger grades (kindergarten–grade 2), stories were used as a teaching aid, getting the students to link together what was read in the story and what was taught in the lesson. The comics allowed the instructor to use a teaching style that worked well with the students; however, the layout of the comics was very difficult for the younger students to follow.

Using visual aids was also helpful when teaching about foods that help to build strong bones. The main sources of “bone-building” foods that were discussed in these lessons were milk, cheese, and yogurt. It was important for the students to understand that there are a variety of different ways to eat these foods. The flashcards showed a variety of options for milk (e.g., chocolate milk, UHT milk, and fresh milk), yogurt (e.g., yogurt tubes, yogurt drink, frozen yogurt) and cheese (e.g., cheese strings, pizza, and grilled cheese). By showing the students the variety of bone-building foods, they were able to better understand the recommendation of having three to four servings of bone-building foods a day (Health Canada, 2007).

TEACHER IMPRESSIONS

The response rate was 94% (n=16) for the focus group. The codes emerging from the focus group session were the same as the students, hands-on activities and visuals, although the teachers did not comment on what foods the children liked or disliked.

Hands on activities

Similar to what has been reported previously by the instructor and the schoolchildren, teachers also identified hands-on activities as the favoured activities:

Kids really liked the taste testing.

Got to see fruits and vegetables they wouldn't be exposed to on a regular basis which was good (liked the tasting).

Bone building activity was a favourite in grade 1.

Kids liked the physical activity components.

The hands-on activities allowed the students to become involved with what was being taught and use more than just their skills of listening to understand what was being presented; this of course allowed students who learn kinesthetically to maximize their ability to understand the lessons.

Visuals

Culturally relevant materials and resources were included throughout both modules. When discussing healthy food options, traditional game meats (e.g., caribou, goose) and fish were always mentioned, as these foods were and are still an important part of many household diets. The importance of the act of hunting, trapping, and fishing was also stressed from a physical activity perspective. However, teachers noted that there was a need to include more visual aids in the program:

Having more visuals with moose, goose and other meat sources would be useful.

Need more visuals — especially since it's difficult to get those kind of things up here — like food models etc.

Nevertheless, overall, the teachers had very positive comments about the program:

Went well with Ontario curriculum.

Huge difference seen in students. They know the four food groups now, it is exciting that they're thinking this way about nutrition now.

RECOMMENDATIONS

Taking into account that Gates et al. (2011) report similar findings for grades 6–8 schoolchildren in Peetabeck Academy, the following are the major recommendations for the delivery of future environmental health programs that have an educational component, in the community of Fort Albany First Nation and similar communities:

1. Visual aids should be used extensively when presenting information. All grades benefited greatly from having visual examples of what was being taught.

2. The number of hands-on and group-work related activities should be maximized to enhance the students' learning environment. These types of activities engage the youth to a greater degree in the learning process.

REFERENCES

- Bandura A. (2004). Health promotion by social cognitive means. *Journal of Health Education and Behavior*, 31(2), 143-164. doi: 0.1177/1090198104263660.
- Center for Disease Control and Prevention. (1996). Guidelines for school health programs to promote lifelong healthy eating. *Journal of School Health*, 67(1), 9-26. Retrieved from <http://www.cdc.gov/mmwr>.
- Dairy Farmers of Canada. (2005). *Power4Bones*. Retrieved August 15, 2010, from <http://www.power4bones.com>.
- De Bourdeaudhuij, I., Klepp, K.-I., Due, P., Perez Rodrigo, C., de Almeida, M.D.V., Wind, M., et al. (2005). Reliability and validity of a questionnaire to measure personal, social and environmental correlates of fruit and vegetable intake in 10-11-year-old children in five European countries. *Public Health Nutrition*, 8(2), 189-200. doi: 10.1079/PHN200467
- Deyhle, D. and Swisher, K. (1997). Research in American Indian and Alaska Native education: From assimilation to self-determination. *Review of Research in Education*, 22, 113-194. doi: 0.3102/0091732X022001113
- Foreman, K. (1991). A dramatic approach to Native teacher education. *Canadian Journal of Native Education*, 18(1), 73-80.
- Fereday, J. and Muir-Cochrane, E. (2006) Demonstrating rigor using thematic analysis: a hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5(1), 1-11. Retrieved from <http://ejournals.library.ualberta.ca>.
- Garriguet, D. (2008). Obesity and the eating habits of the Aboriginal population. *Health Reports Statistics Canada 82-003-XWE*, 19(1), 21-35. Retrieved from www.statcan.gc.ca.
- Gates, A., Hanning, R.M., Gates, M., Isogai, A., Metatawabin, J., and Tsuji, L.J.S. (2011). A school nutrition program improves vegetable and fruit knowledge, preferences, and exposure in First Nation youth. *The Open Nutrition Journal*, 5, 1-6. doi: 10.2174/1874288201105010001.
- He, M., Beynon, C., Sangster Bouck, M., St. Onge, R., Stewart, S., Khoshaba, L., and Lemieux, S. (2007). *Northern Fruit and Vegetable Pilot Program: Final Report*. London, Ontario: Middlesex London Health Unit. Retrieved from <http://www.mhp.gov.on.ca>.

- Health Canada. (2007). *Canada's Food Guide*. Retrieved January 20, 2010, from <http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php>.
- Leith, S. and Slentz, K. (1984). Successful teaching strategies in selected northern Manitoba schools. *Canadian Journal of Native Education*, 12(1), 24–30.
- Lougheed, T. (2010). The changing landscape of Arctic traditional food. *Environmental Health Perspectives*, 118(9), A386–A393. Retrieved from <http://dx.doi.org/10.1289/ehp.118-a386>.
- Owen, S., Schickler, P., and Davies, J. (1997). Food choice: how to assess attitudes of preadolescent children. *Nutrition and Food Science*, 99, 5–11. doi: 10.1108/00346659710157240.
- Rinke, W.J. (1986). Holistic education: a new paradigm for nutrition education. *Journal of Nutrition Education*, 18(4), 151–155.
- Skinner, K., Hanning, R.M., and Tsuji, L.J.S. (2006). Barriers and supports for healthy eating and physical activity for First Nation youths in northern Canada. *International Journal of Circumpolar Health*, 65(2), 148–161. Retrieved from <http://ijch.fi/>.
- Swisher, K. and Deyhle, D. (1989). The styles of learning are different, but the teaching is just the same: Suggestions for teachers of American Indian youth. *Journal of American Indian Education*, Special Issue, 1–14. Retrieved from <http://jaie.asu.edu>.
- Tsuji, L.J.S. (1998). Mandatory use of non-toxic shotshell for harvesting of migratory game birds in Canada: cultural and economic concerns. *Canadian Journal of Native Studies*, 18, 19–36. Retrieved from <http://www2.brandonu.ca>.
- Wauters, J.K., Bruce, J.M., Black, D.R., and Hocker, P.N. (1989). Learning styles: A study of Alaska Native and non-Native students. *Journal of American Indian Education*, Special Issue, 53–62. Retrieved from <http://jaie.asu.edu>.

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