

# THE DEVELOPMENT AND IMPLEMENTATION OF A TYPE 2 DIABETES PREVENTION PROGRAM FOR YOUTH IN THE ALGONQUIN COMMUNITY OF RAPID LAKE, QUEBEC<sup>1</sup>

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## ABSTRACT

The Canadian Aboriginal population has experienced a recent increase in chronic diseases. Type 2 diabetes prevalence rates have been recorded to be 3–5 times greater in Aboriginal populations than in non-Aboriginal populations. Childhood obesity, one of the most significant modifiable risk factors for developing type 2 diabetes, is often preventable with healthy lifestyle choices including exercise and diet. The main goal of this study was to develop and implement a locally and culturally adapted diabetes prevention program for youth in Rapid Lake, an Algonquin community in Quebec, Canada. Using focused ethnography and participatory research principles, the study progressed in four phases. Data collection involved interviews, focus groups, and observations. Thematic analysis was iterative. Findings include three main themes: 1) There was a contradiction between adult assumptions about what youth knew and what youth really knew about dia-

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betes; 2) youth were highly receptive to interactive programming; and 3) youth took on the role of teacher for adult community members. Challenges and rewards to program development were also identified. The participatory approach employed during this project resulted in local Aboriginal youth and community worker empowerment, and will hopefully ensure the continuation of primary prevention diabetes program development and implementation within the community.

**Keywords:** participation, diabetes, primary prevention, Aboriginal, youth.

## INTRODUCTION

Over the past century, health problems among Canadian Aboriginal populations have included a disproportionate increase in chronic diseases, compared to the general Canadian population (Waldram et al., 2006). Among Aboriginal communities and populations living in Canada, the prevalence of type 2 diabetes has increased exponentially, with an incidence 3–5 times greater than in the non-Aboriginal Canadian population (Assembly of First Nations and First Nations Information Governance Committee, 2007; Health Canada, 2007).

The First Nations Regional Longitudinal Health Survey (FNRLHS) was initiated in 1997 by the Chiefs Health Committee and the Assembly of First Nations (AFN) with the intention of collecting data at four subsequent intervals, until 2014, in an effort to develop an overall picture of the status of Canadian First Nations health. In 2002 results from the Quebec segment of the project included an assessment of the modifiable risk factors associated with type 2 diabetes, including obesity, diet, and exercise. Results indicated an elevated incidence of obesity among all age groups, a limited amount of physical activity, in particular among adults, and a high rate of junk food consumption (Assembly of First Nations and First Nations Information Governance Committee, 2007). Lack of physical activity, unhealthy eating habits, and obesity are major modifiable risk factors for type 2 diabetes, and childhood obesity is strongly associated with various long term health consequences, including type 2 diabetes (Young et al., 1999; Sellers et al., 2008).

The project described in this paper was a joint effort between the McGill School of Nursing and the Kitiganik Health Clinic located in Rapid Lake, Quebec, home of the Algonquin of Barrier Lake. The team included a McGill Master's of Nursing student and three supervisors from McGill, the head nurse at the Kitiganik Health Clinic, and two local Algonquin community

workers. Initiated by the Kitiganik Health Clinic, this project was designed to assist the local community workers develop a type 2 diabetes prevention program for local youth in order to decrease the incidence of type 2 diabetes in the community. A pre-existing research partnership was developed by a McGill Master's of Nursing student who conducted a research project with this community focusing on maternal-child health in 2008 (Lang et al., 2010).

## DIABETES PRIMARY PREVENTION PROGRAMS FOR YOUTH

Intensive lifestyle interventions including exercise and dietary counseling with youth have been effective in increasing healthy lifestyle choices for children in Aboriginal communities in Canada (Sellers et al., 2008). The use of primary prevention programs in Aboriginal communities such as Kahnawake, Quebec, and Sandy Lake, Ontario, have been successful in increasing physical activity levels and awareness about healthy eating, as well as increasing awareness about the association of these activities with diabetes prevention (Macaulay et al., 2003). Both the Kahnawake Schools Diabetes Prevention Program (KSDPP) and the Sandy Lake Health and Diabetes Project (SLHDP) include interventions presented in schools as well as community-wide, building on pre-existing strengths, including traditions and the involvement of community organizations (Young et al., 2000; Macaulay et al., 2003).

A study conducted by Hanley and colleagues (2000) inquired into the prevalence of pediatric overweight (2–19 years old) and associated behavioural factors in a Canadian Aboriginal community with known elevated rates of adult obesity and type 2 diabetes. Behavioural factors included television viewing, fitness level, body image concepts, and dietary intake (Hanley et al., 2000). The community in this study was isolated, located approximately 2000 km from Toronto, Ontario, and inhabited by 1600 Aboriginal people (Hanley et al., 2000). Similar to the Algonquin of Barrier Lake in Rapid Lake, Quebec, this community has endured colonization, assimilation, and a subsequent conversion from a traditionally nomadic, subsistence style to a sedentary lifestyle and reliance on nontraditional foods (Hanley et al., 2000).

Results from the study indicated a high prevalence of overweight among children and adolescents (2–19 years old), and potentially modifiable risk factors were associated with overweight in participants aged 10–19 years old (Hanley et al., 2000). The authors reported a significant inverse associa-

tion between overweight and television viewing, fitness level, fibre intake in the previous 24 hours, and a moderate consumption of junk food in the previous 3 months among youth ages 10–19 years old. Similarly, a Quebec regional survey reported overweight and obesity rates for Aboriginal children (0–11 years old) of 12% and 40% and rates of 20% and 22% for youth (12–17 years old) (Assembly of First Nations and First Nations Information Governance Committee, 2007). Such results indicate a need to address physical activity levels and dietary intake among Aboriginal youth in an effort to decrease overweight and obesity rates, with a subsequent decrease in type 2 diabetes incidence.

## SETTING: THE ALGONQUIN OF BARRIER LAKE, RAPID LAKE, QUEBEC<sup>2</sup>

The community of Rapid Lake is located in northwestern Quebec in Parc de la Verendrye Provincial Park, 360 km north of Montreal. The semi-isolated community is home to 400 members of the Algonquin of Barrier Lake First Nation, with about 100 additional members living outside of the community. Traditionally, the Algonquin people of Quebec and Ontario were accustomed to a subsistence lifestyle, including hunting, fishing, trapping, and seasonal horticulture (Chute, 1999). They were nomadic, and settled only during the summer for a few months at communal grounds to participate in trade among bands, as well as for social purposes (Chute, 1999). Throughout the 18th and into the 19th century, colonialization of North America drastically altered the traditional lifestyles of Aboriginal peoples. In an attempt to assimilate Aboriginal peoples reserves were created and many hunter-gatherer societies, including the Algonquin, were forced into sedentary lifestyles and a reliance on nontraditional and European foods (Indian and Northern Affairs Canada [INAC], 1996a). Joint efforts between the government of Canada and churches of various denominations created the residential school system, where many children were placed in an effort to assimilate them (INAC, 1996b). The effects of colonialization and assimilation are still evident today, with nearly 20% of Aboriginal adults in Quebec reporting having attended residential schools, and 40% of these adults reporting negative impacts such as verbal abuse towards family and isolation

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2. Where references are missing, the contextual and historical description of Rapid Lake and the Algonquin of Barrier Lake is based on the student researcher's (JS) experiences in the community, including personal communications with nursing and clinic staff as well as community members.

from family (FNQLHS, 2006). In Rapid Lake, the majority of people over 50 years old attended residential schools.

Within Rapid Lake there is an elementary school, a volunteer fire department, a police detachment, and a federal government health clinic, the Kitiganik Health Clinic. The health clinic has four non-Aboriginal advance practice nurses on staff, a local Algonquin Community Health Representative (CHR), two Algonquin Wellness Counsellors, an Algonquin Youth Worker, an Algonquin Maternal-Child Health program co-ordinator, and an Algonquin National Native Alcohol and Drug Abuse Program (NAADAP) worker. The clinic offers health services to the entire community on a walk-in basis, as well as focused clinics, such as traditional healing methods or infant nutrition programming, which take place in the Day Centre. The Day Centre is a large room at one end of the clinic designed for community activities, and is furnished with tables, chairs, and a large kitchen area.

For more than a decade, the community has experienced internal conflict in the form of a leadership crisis, and external conflicts with the provincial and federal governments on both political and financial matters. Currently, the community is under federal third party management through Indian and Northern Affairs Canada (INAC). There is a high rate of unemployment, estimated at 80-90%, with a concurrent high rate of poverty. Most members of the community receive monthly social assistance payments and live in poorly maintained homes in crowded conditions. Due to the lack of a functioning high school, youth wishing to attend high school must billet with family or friends in Maniwaki or Val d'Or, each an hour and a half away, to attend high school.

Within the community there are no urban amenities: no grocery store, pharmacy, or recreation centre. There are limited organized activities for community members, including for children. The community is involved in some traditional activities including hunting, fishing, and trapping. The Algonquin of Rapid Lake are also one of the few remaining communities where Algonquin is the primary spoken language among community members, with both English and French as secondary languages.

## PROJECT OBJECTIVES

The objectives of this project were to gain a better understanding of local youth knowledge about diabetes and diabetes prevention, and to develop a culturally and locally adapted health promotion program for youth. The long term goal of this program is to decrease type 2 diabetes incidence

in the community. This project addressed these objectives with a focus on health promotion and the use of qualitative research methods. Previously successful diabetes prevention programs for Aboriginal communities, such as KSDPP mentioned above, have included specific quantitative outcomes such as fitness and body composition, and anthropometric measurements assessing body fatness (Macaulay et al., 1997). Community members of Rapid Lake, including nurses and local health care workers, requested a more qualitative approach in an effort to gain a better understanding of youth knowledge about diabetes pathophysiology and the effects lifestyle choices have on the prevention of diabetes. Given the early stages of program development in this community, the flexibility of data collection methods in a qualitative approach was attractive because it gave the researcher the ability to adjust her methods to ensure careful attention to community issues and better suit community participants.

A central research question and three subquestions were used to direct this project. The central question was: what are the challenges and rewards to building and implementing a type 2 diabetes prevention program for youth in Rapid Lake, Quebec? The subquestions were: 1) what do youth understand about diabetes? 2) what is understood about the relationship between lifestyle (exercise, diet) and diabetes prevention? and 3) how can the information gathered in answering the first 2 subquestions be integrated into a culturally sensitive community prevention program for youth?

## METHODS

This project was designed and completed under the auspices of a 3 month Masters in Nursing student research and clinical placement, September–December 2009. Given the time constraints, the focused nature of this study, and the cultural context of the health phenomenon being examined, focused ethnography was the guiding methodology (Polit and Beck, 2004; Speziale and Carpenter, 2007). Ethnography, with roots in cultural anthropology, seeks to understand and describe cultural patterns, experiences, and lifestyles of a group of individuals (Polit and Beck, 2004; Speziale and Carpenter, 2007). While the classical ethnographic study requires that long periods of time be spent living with a group of people of a different culture, a focused ethnography, as the name implies, allows the researcher to focus on a distinct problem within a single context involving a limited number of individuals (Speziale and Carpenter, 2007). The iterative nature of ethnographic research encourages ongoing participant recruitment, data

collection, and data analysis, which allowed the student researcher to adjust project methods throughout, based on ongoing data collection and analyses (Speziale and Carpenter, 2007).

This project was designed with a participatory approach, whereby the main objectives were identified by members of the community, notably local community workers and nursing staff at the Kitiganik Health Clinic. Throughout the project, community members were consulted to ensure that progress fit with community goals and needs, as well as to ensure cultural and local appropriateness. Further, the PRECEDE-PROCEED conceptual model, created by Green and Kreuter for health program planning and evaluation, was chosen as a guiding tool for this project (2005). This conceptual model has been applied in various settings, including KSDPP, for planning health education and health promotion programs as well as policy development (Salsberg et al., 2007). PRECEDE-PROCEED underlines the need to identify predisposing, reinforcing, and enabling factors in an effort to increase relevance of the project for the community and the target population, as well as encourage capacity building within the community (Salsberg et al., 2007). The goal in using this model was to assist community members to initiate and develop health promotion activities (Salsberg et al., 2007).

Within the framework of focused ethnography the methods of data collection used for this project included participant observation, interviews, and focus groups (Roper and Shapira, 2000). Among the defining features of an ethnographic study is the dual purpose of the researcher as both a researcher and research tool or instrument (Maggs-Rapport, 2001; Creswell, 2003). All interviews, focus groups, and pilot programs were facilitated by the student researcher. She also collected, amalgamated, and analyzed data throughout the project via fieldnotes, including methodological, analytical, and descriptive fieldnotes and by keeping a personal journal (Creswell, 2003; Polit and Beck, 2004).

The project proceeded in four phases (refer to Appendix A for schematic representation). In Phase 1, initial data collection included interviews and focus groups with key informants and youth. For the purpose of this project, youth were defined as individuals aged 8–17 years old. Interviews and focus groups were conducted with a prepared list of general, open-ended questions about diabetes, the association between diabetes and exercise and diet, and diabetes prevention. Written informed consent was obtained prior to all interviews and focus groups. When participants were under 18 years old, parental consent and youth assent were obtained.

Key informants were identified with the assistance of staff at the Kitiganik Health Clinic, and chosen via purposive sampling (Polit and Beck, 2004) based on their experience with youth in the community and/or involvement with diabetes education. Five key informants were invited to individual interviews, which took place in a quiet room at the clinic. Key informants included three members of the Algonquin community (an Elder and two community workers), and two non-Algonquin community workers. Individual interviews with key informants were audio-recorded and transcribed.

Using convenience sampling (Polit and Beck, 2004), the grade 5/6 class was invited to participate in a group interview that took place in a classroom at the elementary school, and included 11 students aged 9–13 years old (3 girls and 8 boys). In the absence of a functioning high school in Rapid Lake, adolescent youth were recruited with the assistance of the youth worker via snowball sampling (Polit and Beck, 2004), and were invited to a focus group interview at the clinic in the Day Centre. Five youth attended the focus group, 1 girl and 4 boys, between 13–17 years old. All youth participants were Algonquin members of the Rapid Lake community. The student researcher recorded responses and observations in fieldnotes during the group interview and focus group.

Phase 2 of the project involved the development of a diabetes prevention pilot program based on initial data analysis of Phase 1 data. The program included an interactive segment on basic diabetes physiology education followed by a cooking class activity. There were 15 participants, aged 8–12 years old, including 8 girls and 7 boys. Parental consent and youth assent from Phase 1 included participation in the pilot program; however there were 5 participants in the pilot program that did not have parental consent. They were allowed to participate, but were not questioned for feedback. The program took place in the Day Centre at the clinic.

Feedback and observations from the pilot program were then analyzed to develop Phase 3 of the project. This involved the grade 5/6 students performing the interactive diabetes physiology program as a play for other youth and adults in the community. Advertising for the play took place through word of mouth, some pamphlets handed out in the school, and a poster created by the grade 5/6 class displayed at the clinic. The play took place in the Day Centre at the clinic, and healthy snacks were provided for participants as well as audience members (vegetables, fruits, cheese, and crackers). Again, parental consent and youth assent from Phase 1 included



participation in Phase 3. From the grade 5/6 class, 12 students participated in the play, ages 9–12, 5 girls and 7 boys. There were between 20–30 audience members, including children and adults.

Phase 4 of the project involved a presentation of overall findings to the community. All members of the community were invited to participate via word of mouth and pamphlets. Participants were invited to offer feedback and suggestions at the end of the presentation with an open discussion period. The presentation took place in the Day Centre at the clinic, and was attended by the grade 5/6 class from the elementary school, as well as 15 adult members of the community. There were no objections to the findings or further suggestions made after the presentation.

Data analysis was ongoing throughout the project. In accordance with the iterative nature of ethnographic research, data was gathered, analyzed, new questions were developed, and subsequent data collection and analysis occurred (Speziale and Carpenter, 2007). In Phase 1, case-by-case analysis occurred after each interview, for which the student researcher conducted preliminary coding and classification of themes via multiple closed readings of fieldnotes. When a data set was complete, recurrent themes were identified and analyzed via an adapted form of axial coding, whereby data was analyzed for causal relationships, and key concepts were identified (Strauss and Corbin, 1990). After the completion of a subsequent data set, cross-case analysis identified recurrent themes across data sets which were then assembled and analyzed together (compared and contrasted) (Ayres et al., 2003). Additional codes for emerging topics were created as needed.

During Phase 2, the student researcher presented identified themes to the two involved community workers for member-checking and the development of the pilot program. After the pilot program, feedback and observations were triangulated with previously identified themes for the development of Phase 3, the play. Feedback and observations were again triangulated with previous themes, and after a final cross-analysis, major themes and subthemes were identified. These themes were then presented to the community in Phase 4.

Methodological rigour was maintained via numerous strategies, including: prolonged engagement in the field (3 months); data triangulation among data sets, feedback, and observations; member-checking with the clinic staff and youth; and peer debriefing with McGill supervisors (Stewart, 1998; Mays and Pope, 1995; Cutcliffe and McKenna 1999; Ingleton and Seymour, 2001; Creswell, 2003). An audit trail was maintained via con-

tact between the student researcher and supervisors at McGill, including electronic copies of fieldnotes (Sandelowski, 1986). The student researcher used a personal diary for personal reflexivity on personal biases, values, and interests (Polit and Beck, 2004). This project received approval from the Institutional Review Board of the McGill Faculty of Medicine prior to commencement.

## RESULTS

Three main themes were identified from audio and observational data: (1) there was a contradiction between adult assumptions about what youth knew and what youth really did know about diabetes; (2) youth were positively receptive to interactive programming; and (3) youth were able to act as teachers for adult community members. A number of rewards and challenges were also identified in the data. These findings are discussed below.

### THEME #1. CONTRADICTION BETWEEN ADULT ASSUMPTIONS OF YOUTH UNDERSTANDING AND ACTUAL YOUTH UNDERSTANDING OF DIABETES AND DIABETES PREVENTION

When key informants were asked what they thought youth knew about diabetes, responses included: "I don't think they know anything about diabetes, nobody ever taught them," and "they don't know too much about it." A non-Algonquin community worker replied "I think you would be surprised by how much they know ... I think they're quite aware of what it means to have too much sugar in your blood ... but not an in-depth knowledge." In contrast, during the group interview in the grade 5/6 classroom, student responses to "what do you know about diabetes?" included "it can kill you" and "you have to check your blood." None of the students were able to identify how many types of diabetes there are, and only one student replied to a question about treatment, "pills and needles." The adolescent youth group elaborated a little more on diabetes, with answers like "you shake," "your heart beats faster," and "high blood pressure"; they were also unaware of how many types of diabetes exist.

Although key informants associated having diabetes with being unhealthy, there was a limited understanding that diabetes is preventable. In contrast, youth seemed to have a better understanding. When asked if Rapid Lake youth know that diabetes is preventable, an Elder replied "I don't think so. I didn't know it was." The students in the grade 5/6 class were asked if they thought everyone gets diabetes, and they replied "no." The adolescent

youth group gave the same response. The grade 5/6 students were asked if they thought they might get diabetes, and most students replied “no.” When asked why, one student replied “because I don’t eat sweets.”

When the grade 5/6 class was asked what they can do to prevent diabetes, multiple students replied with answers like “eat healthy stuff” and “no sweets.” In the adolescent youth group, responses to the same question were “eat healthy,” “eat right,” “take care of your body,” and “exercise.” The majority of the participants associated a healthy diet with diabetes prevention; a few included exercise. When the adolescent group was asked if they eat healthy, one boy replied “no, I don’t think I eat healthy. I eat cheeseburgers all the time.” The overall understanding of youth appears to be that diabetes is preventable; however, the association with diet is significantly stronger than the association with exercise.

## THEME #2. THE POSITIVE RECEPTIVITY OF YOUTH FOR INTERACTIVE LEARNING

At the end of the group interview with the grade 5/6 class, as well as at the end of the focus group with the adolescent youth, participants were asked what kind of activities they would like. Both groups suggested a cooking class, and a few individuals wanted to “learn how to cook healthy food.” The youth worker reported the same responses from youth when he asked this question outside of the project. When the youth were asked when they would like the activity, responses included “after school” and “in the evening.” Taking into consideration that youth both reported and were observed to be physically active almost daily, the primary focus of the program was basic diabetes physiology education, encouragement of a healthy lifestyle, and a cooking class.

In discussing the program with a local community worker, it was decided an interactive educational activity would be ideal for the youth. The various educational and literacy levels of the students in the grade 5/6 class, which in reality has students in grades 4–7, and the desire for students to participate in the activity, led to an interactive program designed to explain what happens to food when it enters the body, how energy gets to the muscles and brain, and how being overweight affects this process. The program was developed with influence from the Sugar Man program, developed by an Australian nurse as an educational tool for use with diabetes education for Australian Aboriginal populations that were not receptive to traditional pamphlets and education sessions (Porter, 2007). The main prop

is a large canvas drawing of a man, the Sugar Man, which is placed on the ground. Participants are then guided through body processes, and included in the demonstrations as blocks of sugar or other body organs and processes (Porter, 2007). This project's pilot program included an interactive program based on the idea that acting out the basic physiologic processes of diabetes would enhance the learning experience for participants. Two community workers were involved in preparing and facilitating the pilot program.

The activity involved props made out of various colours of poster board including: a pancreas, 2 insulin keys, 2 keyholes, 2 sugars, a brain, a muscle, a large mouth, a piece of pizza, an apple, broccoli, and 2 blobs of fat (see Appendix B). Eight chairs were lined up in the Day Centre to form a tunnel, with an opening on each side, representing a blood vessel and access to muscles and the brain. The participants were each given a prop, and therefore each played a role in the activity. Prior to beginning the activity, the student researcher briefly explained that the pancreas is a body organ, and insulin a hormone. The muscle participant and the brain participant were placed on the outside of the tunnel at each of the openings, and were each blocked by a keyhole participant. The pancreas was posted on the wall near the far end of the tunnel, and the 2 insulin key participants waited there until prompted. The mouth participant was placed at the beginning of the tunnel, and one of the participants was given the three food items and instructed to feed the mouth. The food passed through the mouth, and turned into sugar. The 2 sugar participants then travelled down the tunnel/blood vessel, and attempted to access the brain and muscle to provide energy. They were blocked by the keyholes. The insulin key participants were then prompted to leave the pancreas to open the keyholes, and the sugar was able to access the brain and the muscle. Participants were asked what happens when the brain has energy, and responses included "You think" and "You're smarter." Participants were also asked what happens when muscles have energy, and responses included "You can exercise" and "You can play."

The participants were then sent back to their starting points, and the 2 fat blob participants were placed in front of the keyholes to represent an overweight body. The entire exercise was repeated, but this time the insulin keys were unable to open the keyholes, and the sugar was trapped in the blood vessel. The participants were asked what happens when the sugar is unable to get past the keyholes to the muscles and brain, and responses included "too much sugar in your blood." When asked what happens next, participants replied "diabetes." Participants were then asked what happens

to the brain when it has no energy, and responses included “can’t think,” and “tired.” The same question was asked about the muscles, and responses included “can’t exercise” and “get tired.”

The participants then returned to the tables and sat down, and were asked what could be done to prevent fat blocking the key holes. Responses included “eat healthy,” “exercise,” and “don’t eat sweets.” The participants then provided the student researcher with suggestions of healthy and unhealthy foods which were written on a white board. Following this, the group participated in a pizza-making class, during which participants were involved in chopping vegetables, making tomato sauce, grating low-fat mozzarella cheese, making caesar salad, and ultimately preparing pizzas on English muffins, hamburger buns, pitas and homemade pizza dough. Toppings included many vegetables as well as locally smoked moose meat.

Near the end of the program, participants were asked for feedback on the program. Responses included “it was fun,” “I liked making the pizza,” and “next time, bigger pizza.” All of the participants replied that they would like another cooking class. Feedback from the community workers was positive as well, and suggested that they could repeat these activities and build on them in the future.

Outcomes of the pilot program included the participants exhibiting an enhanced understanding of basic diabetes physiology. Participant responses about developing diabetes when there is too much sugar in the body, and being able to avoid the fat build-up with exercise and a healthy diet, suggested the participants understood the basic process that was demonstrated to them. The positive reactions to the pizza cooking class, from both the participants and the community workers, suggest that this type of activity may continue in the future. Several participants learned how to cut vegetables for the first time, how to use a cheese grater, and roll out pizza dough. For many participants, this was their first experience with cooking their own food. Participants with experience helped out those without, exhibiting the strong sense of community that exists within Rapid Lake. The presence of the community workers during the activity offered positive role models for the youth participants from within their own community.

### THEME #3. YOUTH AS TEACHERS

The success of the pilot program inspired one of the non-Aboriginal key informants to suggest the idea of presenting the diabetes activity as a play to adults and other youth from the community. The grade 5/6 class was

approached with the idea, and the entire class agreed to participate. The students prepared a poster that was placed in the window of the clinic to advertise the play, and small pamphlets were handed out as well.

There were two play practices prior to the play which took place in the students' classroom at the elementary school. During these play practices, many of the students remembered the program and were able to walk through the healthy and overweight body processes with minimal prompting, indicating an increased understanding of the processes presented to them two weeks earlier. The play was organized to be presented in the Day Centre, and healthy snacks were prepared based on suggestions from the students (vegetable and dip platters, fruits, cheese and crackers). The play was facilitated by the student researcher. Students introduced the pancreas as a body organ, insulin as a hormone, and acted out the healthy body process followed by the overweight body process, resulting in diabetes. The play was performed twice within a half hour, initially to younger children, and later to adults. Feedback from the play was positive, and an adult spectator said "I didn't know that was how diabetes happened," indicating an increased understanding of the basic physiology of the disease. The students from the grade 5/6 class reported having fun. The use of a visual and interactive educational tool was ideal, as there is a wide variety of literacy and educational levels among community members in Rapid Lake. The acting student participants received positive reinforcement from both the audience and student researcher for their enhanced understanding of diabetes physiology, and other youth were eager to participate in the future, asking to get a role in the play.

## DISCUSSION

There are a number of important elements responsible for the success of this project. First, this project was initiated by a request from the Kitiganik Health Clinic for a youth specific type 2 diabetes prevention program, and was therefore not imposed on the community. Second, a participatory philosophy guided the project from start to finish. Third, the flexible ethnographic methodology used to guide this project allowed the researcher to develop an understanding of the community through interviews, focus groups, observations, a pilot program, and a play. Fourth, youth and adults in the community were keen as participants throughout.

In Canada, an elevated incidence of type 2 diabetes among Aboriginal populations, significantly higher than among non-Aboriginal populations,

is increasing significantly yearly (Assembly of First Nations and First Nations Information Governance Committee, 2007; Health Canada, 2007). Within the past 15 years, 2 community wide diabetes prevention programs have been developed with long-term success (Macaulay et al., 2003). These programs, in the suburban community of Kahnawake and the isolated community of Sandy Lake, were initiated by the communities and included partnerships with University research teams (Macaulay et al., 2003). The program that was developed in Rapid Lake, although smaller in scale and focused on the subgroup of youth, was guided by successful components of these 2 programs. Commonalities include project initiation by the community, namely staff at the Kitiganik Health Clinic; principles of participatory research guiding the partnership between the student researcher and the two involved community workers; presentation of preliminary analyses to the community for feedback and comment throughout and also prior to external dissemination, and development of the program based on the principles of health promotion (Macaulay et al., 2003).

The PRECEDE-PROCEED conceptual model was applied in the development of the KSDPP (Salsberg et al., 2007). The KSDPP identified children's knowledge and skills as predisposing factors, the support of teachers and family as reinforcing factors, and the availability of healthy foods and opportunities for physical activity as enabling factors (Macaulay et al., 1997, p. 781). The Rapid Lake project identified similar factors, reinforcing the potential for future development of this project into a community wide program.

Interviews with Community Health Representatives (CHR) from various Inuit and First Nations communities conducted by Richmond and Ross (2008) suggest that social support in smaller, more remote Aboriginal communities may have both negative and positive impacts on health behaviour. Although social support was reported to be "fundamentally connected to sense of belonging which is established through embeddedness of individuals within their family and context" (p. 1431), the CHRs also noted that this embeddedness may restrict individuals from healthy behaviour changes (Richmond and Ross, 2008). These restricting forces include peer pressure, lack of education, and social obligations that prevent the individual from altering behaviour (Richmond and Ross, 2008). The youth in Rapid Lake may have strong social bonds with their families and community; however, these influences may be both positive and negative. Encouraging positive relationships and addressing negative ones, may require developing a community wide program to incorporate the effects of diverse relationships.

According to Gahagan and Silverstein (2003), major barriers to prevention and treatment of type 2 diabetes among American Indian and Alaska Native youth, include a dysfunctional family situation, environmental obstacles such as limited access to resources, and lack of healthy role models. Similar factors were identified as challenges to the program in Rapid Lake. Solutions suggested by Gahagan and Silverstein (2003) include cultural competence training for staff and health care professionals, and inclusion of members of the community in the design of clinical services. The Rapid Lake project was a team effort that included the student researcher, two community workers, and the nursing staff at the clinic. This allowed the student researcher to ensure that program elements were culturally and locally appropriate, and that participants were comfortable during the pilot program with local community members present who were fluent in the Algonquin language.

The long-term success of the KSDPP and SLHDP programs is partially attributed to the target group including the entire community as a unit (Macaulay et al., 2003). Due to the time constraints of this project, identifying and focusing on youth diabetes prevention using focused ethnography as a guiding methodology was not a realistic option. Macaulay et al. (2003, p. 467) also attribute building on pre-existing strengths, using an iterative process, the promotion of co-learning and empowerment, and the dissemination of findings and knowledge internally and externally as key factors to program success. These remaining factors were used in the Rapid Lake project, where pre-existing strengths such as youth exercise levels and associations between diet and being healthy were built upon and encouraged; data analysis occurred via an iterative thematic analysis; co-learning and empowerment were encouraged via the production of a play and the active partnership between the student researcher and the community workers; and findings were presented to the community prior to dissemination externally. The partnership between the Kitiganik Health Clinic and the McGill School of Nursing remains active, encouraging external dissemination of information, as well as future research opportunities on projects identified by the community.

Over the three months of data collection, program design, and implementation, a number of challenges and rewards to developing this program were identified. To begin, there is an overall lack of exposure to health-specific education. By developing the pilot program with the intention of continued diabetes prevention education, this lack of education may be



addressed. Second, it became clear early on that mixing ages in activities was not appropriate, as was demonstrated during the pilot program, when older youth left early, presumably because of the number of younger participants. The need for age appropriate programming can be addressed by developing similar programming specifically for adolescent youth. There is also a lack of youth 13–16 years old in the community due to the absence of a high school. Adolescent youth requested a cooking class as well; making a class specifically for this age group may increase adolescent attendance.

Another challenge was the lack of youth and Aboriginal specific diabetes physiology education tools available. We therefore adapted the Sugar Man program for our age group. One challenge which emerged is more difficult to address: the geographical environment. The distance to amenities makes it difficult for many community members to keep healthy food options such as fresh fruits and vegetables in their homes on a regular basis. During a key informant interview, the following comment was made: “Some people have no fridge, it’s easier for them to use white bread and pizza because it’s cheap ... if you want to buy some fresh [food], you have to go an hour and a half.” This quote emphasizes the challenges faced by all members of the community due to both location and financial status.

Despite these challenges, a number of rewards demonstrate the potential to support the development of future programming in the community, as well as the continuation of the developed program. Encouraging youth to continue to exercise through adolescence and into adulthood promotes this already present preventive behaviour. The strong association between diet and being healthy has led youth identifying a need for cooking classes, an activity that is relatively simple to organize in the Day Centre at the clinic. The eagerness and interest of the youth to participate and learn encourages the facilitators to provide future programming. Both the CHR and youth worker expressed a desire to organize activities for youth in the future. The involvement of these two Algonquin individuals resulted in capacity building for future community initiated activities.

Findings from this project suggest a need to address the community as a whole in the future. Local individuals will periodically open small stores where they will sell candy, soda, and chips. Encouraging these stores to include healthier options may give the local population better access to healthy food options. Addressing the diet of youth at the elementary school by working with the kitchen staff, teaching staff, and students may result in healthier options that appeal to all students and staff. Integration of

the developed program into school curriculum is another possible development. One of the community workers mentioned an interest in developing a youth specific, healthy diet cookbook for distribution to Rapid Lake youth.

## LIMITATIONS

This study has three main limitations. First, ethnographic research requires extensive periods of time be spent in the field of study, with total submersion in the participants' way of life (Maggs-Rapport, 2001). The student researcher was limited to a three-month clinical placement on site. The restricted length of time required that trust be established rapidly. Fortunately, the student researcher was able to work closely with key informants, and to spend 2–3 days a week working in the health clinic with the nursing staff which facilitated this process. Also, she spent time in the elementary school to allow the grade 5/6 students to get to know her.

Second, inherent in ethnographic research is the dual role of the researcher as researcher and research instrument or tool, which can increase the risk of personal bias (Maggs-Rapport, 2001; Creswell, 2003). To reduce the effects of personal biases, the student researcher kept a personal journal. This journal, as well as regular contact with supervisors at McGill University, encouraged personal reflexivity and critical reflection on how her own biases, preferences, and preconceptions may have influenced data choices and analysis (Polit and Beck, 2004). Reflexivity, an important part of ethnography, is defined as a "process in which an investigator seeks to understand how personal feelings and experiences may influence a study and then strives to integrate this understanding into the study" (Lamb and Huttlinger, 1989, p. 765).

Third, responses during the group interview with grade 5/6 youth and during the focus group with the adolescent youth group were generally short sentences or single words. The use of group interviewing methods may have resulted in some individuals feeling "uncomfortable about expressing their views in front of a group" (Polit and Beck, 2004, p. 343). This was addressed at the beginning of each group interview, during which participants were discouraged from using personal experiences or stories including names of individuals. This limitation is balanced by the benefits of group interviewing such as an increased comfort level for participants surrounded by peers, participant reactions to what is said, and rich data collection based on answers as well as observations of interactions (Polit and Beck, 2004, p. 343).

## KNOWLEDGE TRANSLATION AND IMPLICATIONS

With an increased understanding of the basic physiology of diabetes and the association between exercise and diet and maintaining a healthy weight, the youth in Rapid Lake will benefit from the continuation of a program like this one. Working closely with the community workers enabled the student researcher to ensure cultural and local adapted programming, and empowerment of the community workers who will likely continue the developed programming, ensuring sustainability. The presentation of a play performed by the youth on basic diabetes physiology gave community members a chance to learn about diabetes, as well as participate in a community activity led by local youth. In turn, the youth were able to share their new knowledge with other community members, achieving empowerment for the youth and education for the audience members from within their own community.

Upon completion of the study, results were presented to the community. Community members were given the opportunity to respond to findings, and make suggestions for future program development. The findings were well received by audience members at the presentation, including the grade 5/6 students, who expressed a desire to continue with similar programming such as more cooking classes. The student researcher prepared a written document describing in detail the process of the program, and left this document as well as the program materials with the Kitiganik Health Clinic staff for future use. A presentation was given to staff at Health Canada in Montreal in April, 2010, by the student researcher, and an abstract has been submitted for presentation at Aboriginal nursing and health conferences.

## CONCLUSION

The elevated rates of obesity and overweight among Aboriginal youth are a cause for concern, in particular as a modifiable risk factor for the development of type 2 diabetes. This project was initiated by community workers in Rapid Lake, who identified a need for a type 2 diabetes prevention program for youth in the community. Through a partnership between the McGill School of Nursing and the Kitiganik Health Clinic, a McGill Masters of Nursing student spent three months on placement in Rapid Lake organization and implementing the project. Using focused ethnography as a guiding methodology, the student researcher was able to collect and analyze observational and interview data in a flexible manner suitable to the setting. Incorporating the PRECEDE-PROCEED health promotion frame-

work, which has been successfully applied in the past for the development of diabetes prevention programs for youth in other Aboriginal communities (KSDPP, SLHDP), allowed health promotion based on community strengths. The three main themes identified were: (1) there was a contradiction between adult assumptions about what youth knew and what youth really knew about diabetes; (2) youth were receptive to interactive programming; and (3) youth were able to act as teachers for adult community members. A number of challenges and rewards to program development were identified as well.

The interactive activity reinforced the youth participants' knowledge about healthy diet and exercise, and encouraged the promotion of a healthy lifestyle to prevent overweight or obesity. Youth were keen to participate in the activity and receptive to the information provided. The development of a play for community members to attend reinforced the information the youth participants had acquired and shared it with other community members. The materials and methods for the interactive activity remain in Rapid Lake, and can be used by community workers as an educational tool for various age groups. Future directions for community workers in Rapid Lake may be to develop a community wide health promotion program, including activities for all ages. The development of this program has resulted in Aboriginal youth and community worker empowerment, and will likely result as well in the continuation of primary prevention diabetes program development and implementation from within the community.

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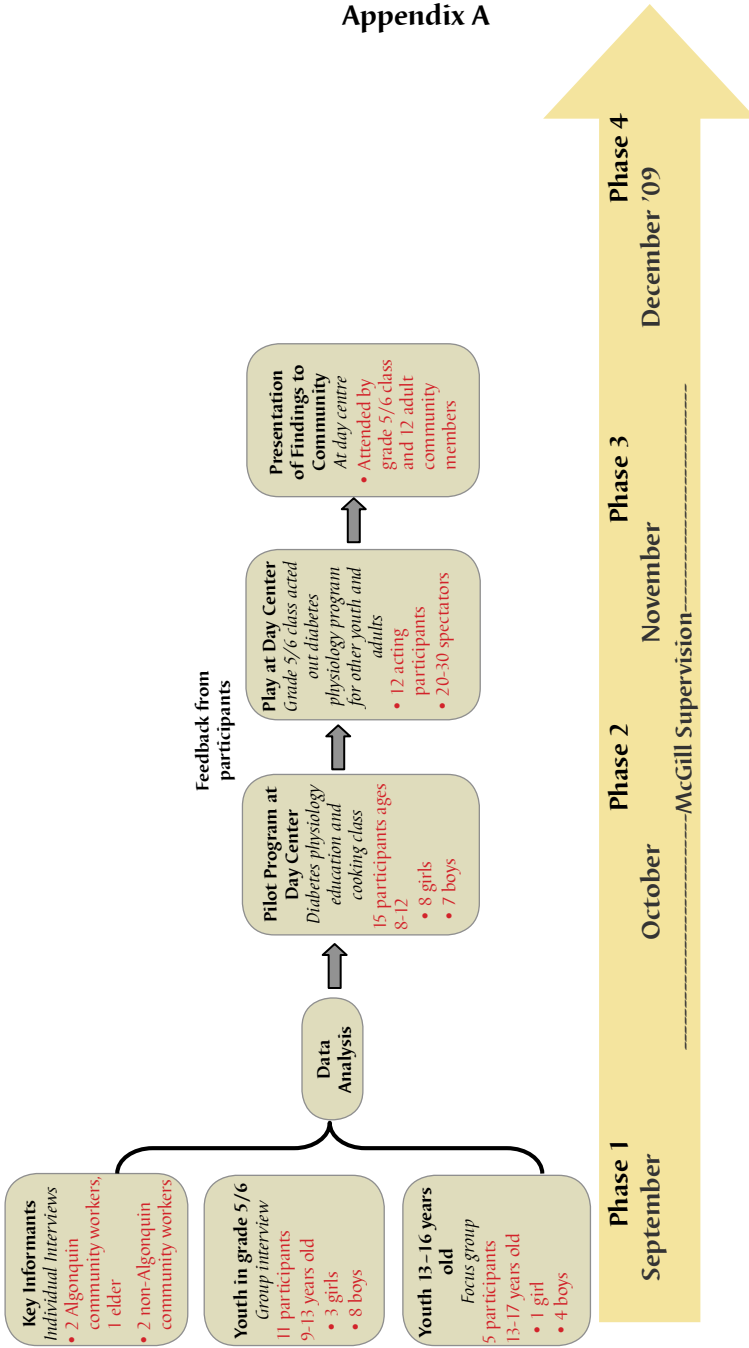
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### Appendix A

Figure 1. Schematic overview of project progression through four phases.





## Appendix B

**Figure 2. Materials used during the interactive diabetes physiology education program: (A) pancreas x1, (B) insulin keys x2, (C) mouth x1, (D) muscles x1, (E) brain x1, (F) key holes x2, (G) pizza slice x1, (H) broccoli x1, (I) apple x1, (J) sugars x1, (K) fat blobs x2.**



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