

Using provider perspectives to understand what makes obesity and diabetes prevention programs for children living in a First Nations Community in Northern Ontario effective

by

Andrew Niles

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## Abstract

Diabetes is a disease that is highly prevalent in Indigenous communities at rates that exceed the general population by up to four times. This research will explore the efficacy of an obesity and diabetes screening and prevention program for children and youth that was self-initiated in a First Nations community. Eight staff employed at the health and wellness centre were interviewed using semi structured interviews. It was found that the program experienced much success over the years due in part to the use of incentives, culturally appropriate programming and dedicated staff. The program's growth over the years led staff to conclude that time and human resources were major limitations to the program. This research highlights key areas that should be addressed when implementing a program and provides valuable insight for other communities wanting to implement a program like this.

**Keywords:** First Nations, Obesity, Diabetes, Screening, Prevention, Children, Youth, Process Model

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# Table of Contents

<b>Abstract</b>	<b>ii</b>
<b>Acknowledgements</b>	<b>iii</b>
<b>Table of Contents</b>	<b>iv</b>
<b>List of Tables</b>	<b>viii</b>
<b>List of Figures</b>	<b>ix</b>
<b>List of Appendices</b>	<b>x</b>
<b>CHAPTER 1: INTRODUCTION</b>	<b>1</b>
<b>1.1 Definitions</b>	<b>1</b>
<b>1.2 Thesis Overview</b>	<b>2</b>
<b>1.3 Background</b>	<b>2</b>
<b>1.4 Obesity Epidemic and the link to Type 2 Diabetes</b>	<b>4</b>
<b>1.5 Causes of Obesity and Diabetes</b>	<b>5</b>
<b>1.6 Social Determinants of Health with an Indigenous Focus</b>	<b>7</b>
<b>1.6.1 Indigenous Ancestry</b>	<b>8</b>
<b>1.6.2 Income and Employment</b>	<b>10</b>
<b>1.6.3 Food Security</b>	<b>12</b>
<b>1.6.4 Education, Access to necessities, Environments</b>	<b>14</b>

<b>1.7 Interventions Used in First Nations Communities</b>	<b>18</b>
1.7.1 Kahnawake	19
1.7.2 Sandy Lake	20
1.7.3 Current Research in Canada	21
<b>1.8 Purpose and Overview of the Research</b>	<b>22</b>
<b>1.9 About the Community</b>	<b>23</b>
<b>CHAPTER 2: FRAMEWORKS</b>	<b>25</b>
2.1 Socioecological Model	26
2.2 Life Course Theory and Diabetes	28
<b>CHAPTER 3: METHODOLOGICAL APPROACH</b>	<b>36</b>
<b>3.1 SITUATING MYSELF IN THE RESEARCH</b>	<b>37</b>
<b>3.2 Guiding Principles:</b>	<b>38</b>
3.2.1 Indigenous Research Paradigm	38
3.2.1 Indigenous Wholistic Theory	39
3.2.2 The Medicine Wheel	40
3.2.3 Ontology:	40
3.2.4 Epistemology:	41
3.2.5 Axiology:	42
3.2.6 Relational Accountability:	43
3.2.7 Respectful Representation:	44
3.2.8 Reciprocal Appropriation:	44
<b>3.3 Methodology</b>	<b>48</b>
3.3.1 Study Design:	48

<b>3.3.2 Data Collection:</b>	<b>49</b>
<b>3.3.3 Personal Reflection</b>	<b>50</b>
<b>3.3.4 Analysis</b>	<b>50</b>
<b>3.3.5 Validation</b>	<b>51</b>
<b>CHAPTER 4: RESULTS</b>	<b>52</b>
<b>4.1. Program Specifics</b>	<b>52</b>
<b>4.1.1 Program Overview</b>	<b>52</b>
<b>4.1.2 Screening Tools</b>	<b>53</b>
<b>4.1.3 Incentives:</b>	<b>54</b>
<b>4.1.4 Follow Up Programming:</b>	<b>54</b>
<b>4.2 Themes</b>	<b>57</b>
<b>4.2.1 Theme One: Program Details</b>	<b>58</b>
<b>4.2.2 Theme Two: Incentives</b>	<b>65</b>
<b>4.2.3 Theme Three: Culture and Tradition</b>	<b>68</b>
<b>4.2.4 Theme Four: Barriers and Limitations</b>	<b>81</b>
<b>4.2.5 Theme Five: Facilitators</b>	<b>93</b>
<b>CHAPTER 5 DISCUSSION OF RESULTS</b>	<b>104</b>
<b>5.1 Theme One: Program Details</b>	<b>104</b>
<b>5.1.1 Recommendations</b>	<b>108</b>
<b>5.2 Theme Two: Incentives</b>	<b>110</b>
<b>5.2.1 Recommendations</b>	<b>111</b>
<b>5.3 Theme Three: Culture and Tradition</b>	<b>112</b>
<b>5.3.1 Recommendations</b>	<b>116</b>

<b>5.4 Theme Four and Five: Barriers, Limitations and Facilitators</b>	<b>117</b>
<b>5.4.1 Recommendations:</b>	<b>119</b>
<b>5.4.2 Facilitators</b>	<b>123</b>
<b>CHAPTER 6: CONCLUSION</b>	<b>124</b>
<b>6.1 Implications</b>	<b>127</b>
<b>6.1.1 Limitations and Considerations</b>	<b>131</b>
<b>6.2 Closing Remarks</b>	<b>132</b>
<b>WORKS CITED</b>	<b>163</b>

## List of Tables

Table 1 – Summary of Life Course principles	28
Table 2 – Summary of programs at Garden River First Nation	56

## List of Figures

Figure 1 – Socioecological model of health	26
Figure 2 – Process model outlining CB-PAR	47
Figure 3 – Word cloud generated from interview data	58
Figure 4 – Flow chart outlining barriers and limitations	120
Figure 5 – Process model highlighting components of the Back to School Blitz	130

## List of Appendices

Appendix A – Summary of recent Canadian interventions	133
Appendix B – Garden River Ethics Approval	138
Appendix C – Laurentian University Ethics Approval	139
Appendix D – Respondent letter of information	140
Appendix E – Respondent consent form	142
Appendix F – Conversation guide	143
Appendix G – Community flyers	144
Appendix H – Parental/Caregiver information letter	148
Appendix I – Garden River screening form	149
Appendix J – Physical Activity Questionnaire (Elementary)	150
Appendix K – Physical Activity Questionnaire (High-School)	153
Appendix L – Parental/Caregiver’s Assessment Questionnaire	156
Appendix M – Additional interview quotes	157

# Chapter 1: Introduction

## 1.1 Definitions

Aboriginal – People who identify with at least one Aboriginal group (First Nations, Metis or Inuit) and/or those who report being Treaty Indian or a Registered Indian as defined by the *Indian Act of Canada*, and/or those who report they were members of an Indian band or First Nation (Statistics Canada, 2013)

Indigenous<sup>1</sup> – In Canada, it is the growing term of popularity as a collective noun for First Nations, Inuit and Metis and is beginning to replace the term “Aboriginal” in certain contexts (ICTI, 2018).

Culture – the integrated pattern of human knowledge, belief, and behaviour that depends upon the capacity for learning and transmitting knowledge to succeeding generations (Merriam-Webster, n.d). The expression, the life-ways, and the spiritual, psychological, social, material practice of the Indigenous worldview which is made up of primary concepts: The spirit, the circle, harmony and balance, relationships, kindness/caring/respect, connection to earth, path of life as interconnected and inter-generational, and language (Dumont, 2014)

Wholistic Health and Wellness – the spiritual, emotional, mental and physical aspects that contribute to the well-being of an individual, enabling them to live an enjoyable life (AFMC, n.d)

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<sup>1</sup> Where possible the term “Indigenous” will be used in place of Aboriginal to describe the population being discussed.

## 1.2 Thesis Overview

This thesis utilized a community based-participatory action approach in partnership with a First Nations community near Sault Ste. Marie to evaluate the efficacy of a long-standing child and youth diabetes and obesity screening and prevention program through a qualitative case-study approach. Overall, this study was informed by the *Socioecological Framework* (Willows et al., 2012), and *Life Course Theory* (Elder, Johnson and Crosnoe., 2003). The goals of this study are to aid the community in providing recommendations for their programs as well as create a process model for other communities wishing to implement a program of similar nature.

## 1.3 Background

Diabetes is a complex disease with a vast number of causes and is one of the most rampant and debilitating obesogenic diseases that Indigenous populations in Canada face (Willows et al., 2012; Young, Reading, Elias & O’Neil, 2000). The three main types of diabetes—type 1, type 2 and gestational, delineate the presence of high blood glucose with poor system absorption, with type 2 diabetes (non-insulin dependant diabetes mellitus) being the most common (Young, 2003). Type 2 diabetes is a metabolic disorder characterized by insulin resistance in the cells and reduced insulin secretion from the pancreas due to beta cell dysfunction (Punthakee et al., 2018). Insulin resistance therefore inhibits a normal response from fat, muscle and liver cells to absorb glucose in the blood stream (FNIGC, 2012). Diabetes has been linked to reduced lifespan by 5-15 years, as well as contributing to microvascular changes causing: cardiovascular disease, renal failure, limb amputation, stroke, heart attack and blindness (PHAC, 2011; CNIB, 2015). Diabetes currently affects 3.5 million Canadians, and that number is expected to increase by 44% by 2025 (Statistics Canada, 2016).

There does however, exist a disproportionality within Canada, with Indigenous populations having a 1.5-5 times higher rate of diabetes onset than the rest of the Canadian population (Diabetes Canada, 2018; FNIGC, 2012; Hanley et al., 2005; Horn et al., 2007; Martens et al., 2002; Tjepkema, 2002). Diabetes was virtually unknown in Canada's Indigenous population 50 years ago and has emerged and grown rapidly over the past few decades (Young et al, 2000). In fact, diabetes has become so prevalent, especially in the younger Indigenous community, that it is now being considered an epidemic, posing considerable threat to their overall health and well-being (Ball and McCargar, 2003; PHAC, 2011; Young et al., 2000). Diabetes diagnosis is more common among First Nations adolescents than in the general Canadian population (Young, 2003) and for every boy that is diagnosed, there are five girls (Dean, 1998). It is pertinent to note that there are disparities contingent on geographic location with relation to the distribution of diabetes, with Indigenous populations living on reserve reporting a higher diabetes diagnosis than those living off reserve (PHAC 2011; FNIGC, 2012; Young et al., 2000).

The Public Health Agency of Canada reported in 2011 that the proportion of First Nations people living with diabetes to be 17.2% on-reserve, 10.3% living off-reserve, and 7.3% among Metis people. Compared with the non-Indigenous prevalency of 5%, it is clear that this is an issue posing great risk to the health and well-being of these populations (Rice et al., 2015). In many instances, diabetes can often go undetected, and in fact, as many as 30% of diabetes cases can go undiagnosed, thus underestimating the current prevalency at any given time (Young and Mustard, 2001). Furthermore, a study conducted by Turin et al (2016) tracked nearly 3 million people, 70,631 of whom identified as First Nations, for lifetime development of chronic disease. In this study they found that 8 out of 10 First Nations people will develop diabetes in their life compared to 5 out of 10 of those who did not identify as First Nations, with proportions being

much higher in First Nations populations living in rural communities. According to the First Nations Information Governance Centre (FNIGC) (2018), recent estimates suggest the age-standardized prevalence of diabetes among First Nations adults was 19.2%.

## 1.4 Obesity Epidemic and the link to Type 2 Diabetes

It is well documented and understood that obesity is the most important risk factor in screening for type 2 diabetes (Caprio and Tamborlane, 1999; Newmark and Anhalt, 2007; Raphael, 2016; Willows et al., 2012). The mechanism leading to the two main defects in type 2 diabetes, beta cell dysfunction in the pancreas and insulin resistance, is still not completely understood. When the body constantly has to produce insulin to cause glucose absorption, a gradual resistance to insulin builds, which in turn causes more insulin to be produced. At a certain point, insulin producing cells begin to fail, thus leaving excess glucose and fructose in the blood stream, unable to be absorbed. This leads to a diagnosis of diabetes, often marked by stages of pre-diabetes during the years this disease takes to form (Porte and Kahn, 2001). Obesity among Indigenous peoples is a recent phenomenon (half a century ago) (Young et al., 2000) and has been linked to changes to diet and lifestyle (Bruce et al., 2010). Excess fat storage is mainly localized around the abdomen and upper-body, which is associated with increased risks for type 2 diabetes (Delisle, Rovard & Ekoe, 1995; Young et al, 2000). The FNIGC in its 2012 report estimates that for children 2-11, 20.3 percent are overweight and 42.2 percent are obese, with approximately half of youth ages 12-17 being overweight or obese. Most adolescents will not outgrow childhood obesity, and as a result have a strong likelihood to continue to gain weight into their adult years (Freedman et al, 2005; Singh, Mulder & Twisk, 2008).

## 1.5 Causes of Obesity and Diabetes

The causes of obesity among Indigenous populations is a complex issue with arguments being made that the root cause is either genetic, environmental or some combination of the two (Willows et al., 2012). The thrifty gene theory was originally proposed in 1962 by population geneticist James Neel. This theory took into account the evolutionary traits exhibited in traditional hunter/gatherer populations (such as the Indigenous peoples of Canada) that allowed them to survive periods of famine using a *thrifty* genetic proponent to store excess fat (Poudrier, 2007). According to Neel (1962), individuals of hunter/gatherer ancestry who exhibited diabetic traits and who were born of mothers who did not have diabetes, but had fathers who were diabetic, reconfirmed that there was a genetic predisposition occurring in that individual. He postulated that the “thrifty” component was responsible for diabetes by being overexpressed in recent times due to the advent of “Westernization,” increased access to food and reduced physical activity. This hypothesis underwent re-evaluation over the next twenty years with the discovery of new evidence dealing with the various types of diabetes. Neel (1982) restructured his hypothesis to include the different forms of diabetes, for which there was no distinction in his previous paper, leading him to look exclusively at non-insulin dependent diabetes mellitus (NIDDM) or type 2 diabetes. Challenged with even more evidence disproving the validity of a genetic marker responsible for this, Neel (1999) proposed that although his original hypothesis was oversimplified, the thrifty genetic concept remains viable and a desirable hypothesis to evoke.

The appropriateness of this hypothesis in addressing the factors that influence the high degree of type 2 diabetes among Indigenous people is instrumental, given that this hypothesis remains highly regarded among a number of scientists and serves as an acceptable way of explaining high

rates of diabetes in Indigenous populations in public as well as academic arenas (Poudrier, 2007). Perhaps the biggest landmark case exploring the thrifty gene theory can be found in a study conducted by Hegele et al. (1999); (2003), which explored the Oji-Cree people of Sandy Lake, Ontario. This study looked at the geographically isolated population in comparison with other ethnic groups and discovered a mutation known as HNF1A G319S, that was unique to the Oji-Cree peoples, delineating the presence of what many deem to in fact be the “thrifty gene”. Hegele et al. (1999) discovered that this gene was present in the people who exhibited high rates of diabetes and suggested that this was responsible for the genetic predisposition hypothesized by Neel (1962). The study was further examined by Harries et al. (2008) who found that this variant as well as abnormal splicing may in fact be responsible for the high degree of diabetes in this population.

A number of scientists have stressed that the role of genetics in causing diabetes has not been clearly established (Chaufan, 2004; McDermott, 1998), with the idea of the environment and its resulting impacts on genetics largely unknown as well (Poudrier, 2007). Poudrier (2007), criticizes the findings by Hegele et al. (1999) by asserting that genetic homogeneity among Indigenous populations (a key caveat in validating the thrifty gene hypothesis) overlooks the fact that people from different cultures would have also needed to survive during famine. Poudrier further goes on to say that the thrifty gene theory is binary based, implicating race as a negative and misguided proponent of the theory, pitting the healthy white male against the “problematic race with the problematic disease” (Poudrier, 2007, p. 252). Lippman (1991) also stresses that identifying genes as the culprit, further perpetuates the ideology that diabetes is inevitable and that there are those who possess inferior genes, making them the issue that must be fixed. Tuchman (2011) states that race and culture play a part in determining the high prevalence of

diabetes, not because of genetic makeup, but because of the social implications that poverty, food insecurity and other disadvantages have in putting certain groups at risk. It is important to note that Hegele and colleagues concluded that this abnormal gene is responsible for the matured onset of diabetes of the young (MODY) in the Oji-Cree. Mathematical models, however, suggest that an obesogenic environment is responsible for most of the burden (Hegele et al., 2003). It is more acceptable to therefore utilize a strengths-based approach to understanding how diabetes can be prevented in Indigenous populations, as one that considers the social determinants of health, rather than the thrifty gene theory, which hinges on deficits within genes (Tobe et al., 2015).

## 1.6 Social Determinants of Health with an Indigenous Focus

Dennis Raphael's (2016) work *Social Determinants of Health: Canadian Perspectives Third Edition* highlights the important role that economic and social conditions play in determining the health of populations. These determinants are: Indigenous Ancestry, disability, early life, education, employment and working conditions, food security, gender, geography, health care services, housing, immigrant status, income and its distribution, race social safety net, social exclusion, and unemployment and employment security. According to Graham (2004), these determinants help to determine the physical, social and personal resources an individual has to achieve their aspirations, thrive in their environment, and satisfy their needs. Understanding how a society makes these resources available is a large predictor of the health disparities members of the population face (Maar et al., 2011). The social determinants of health can be bigger predictors of health disparities than simply health behaviours alone (e.g. tobacco use, physical activity, diet) (Raphael et al., 2012). Specifically, there is a direct correlation between children and youth living with type 2 diabetes and the social determinants of health, with these

determinants acting as barriers to overcoming and avoiding the onset of this disease (Copeland et al., 2011; Protudjer et al., 2014). These determinants influence the incidence, prevalence, and subsequently the successful management of diabetes (Raphael et al., 2003). In Indigenous communities, issues of poverty, poor housing, over crowding, lone-parent households, geographic isolation, food security, lack of access to healthcare, and cultural sensitivity deficiencies in medical practitioners all contribute to high degrees of obesity in children (Loppie Reading and Wien, 2009; Willows et al., 2009; King, Smith and Gracey., 2009; Willows et al., 2012). A study by Green et al. (2003) demonstrated, through special distribution across the city of Winnipeg, that the distribution of diabetes was highest among areas that have a high percentage of Indigenous populations, low educational levels, low family income, lone-parent households, and unemployment. The determinants explored here will focus on the ways that they disproportionately impact this population, specifically the on-reserve population.

### 1.6.1 Indigenous Ancestry

Colonization of Indigenous lands by European settlers during the 17<sup>th</sup> century marked the beginning of a set of events that would lead to the current state of affairs (Hurley, 1999). Leslie (2000) outlines ways that policy was used as a “legal” way of controlling Indigenous lands. Land, such as present-day Ontario, was systematically acquired for the Crown under the Royal Proclamation of 1763. This was due to the position Indigenous peoples had, which was to act as middlemen for the fur trade and to assist armed forces during war. Following the war of 1812, these traditional roles were abandoned and changed in favour of ones that would assimilate the Indigenous population seamlessly into the new order of things.

The Indian Civilization Program in 1830 was a process for land cession treaties, Indian reserves, and a system of schools were to be organized and integrated into the lives of Indigenous peoples.

The aim was to turn Indigenous peoples into productive members of the society through processes such as farming and schooling systems in an attempt to “civilize” the population. The inception of Canada as a country in 1867 meant that the British would no longer be responsible for issues such as negotiations with Indigenous leaders. The Indian Act of 1876 was a means to identify who qualified as an Indian, reasons to lose status, what made an Indian band, Indian reserves and how to divide them, rules for management and sales of timber and minerals, dispersion of Indian moneys, band election procedures, bands on cultural expressions and hundreds of others. The Indian Acts of 1876, 1880 and 1884 specifically outlawed ceremonies such as the sundance and potlatch. These documents also allowed for the government to control food, goods and travel available to on-reserve populations (Hurley, 1999). Furthermore, residential schools allowed for the forceful removal of children from their homes to be placed in often cruel institutions to be culturally sterilized of their traditions and customs (Smylie and Anderson, 2006; Smylie and Firestone, 2016). Significant changes were made in 1951 and 1985, to allow for more rights and privileges; however, much of the original structure of the 1876 document still persists in every day dealings (Hurley, 1999).

According to Smylie and Firestone (2016), as part of the movement to assimilate Indigenous populations into European culture, approximately 100 residential schools were established throughout Canada from 1849 to 1983, with the 1920 Indian Act legislation making attendance of all First Nations children from the ages of 7 to 15 mandatory. An excerpt from the *First Nations and Inuit Regional Health Survey* indicates that as many as 5 generations were removed from homes and families and stripped of their culture and traditions, thus setting up intergenerational trauma and loss of traditional skills, such as traditional parenting. Children were kept in isolation and often separated from siblings and subjected to strict western teachings

on sex, marriage, language and decorum. Many children died from disease; others were destroyed emotionally and spiritually, and, in many cases, suffered torture and sexual abuse. Speaking in their native tongue was punishable and seldom did any student actually graduate from these schools (FNIHB, 1999). Mosby and Galloway (2017) indicate that severe undernutrition occurred in many residential schools, with children having an inadequate caloric intake made up of rancid and rotting food. Over time this undernutrition contributed to stunted growth, a known contributor of greater insulin sensitivity and lower insulin levels, increasing the likelihood of being diagnosed with type 2 diabetes. The last of the residential schools were closed in 1996. Indigenous ancestry, is therefore considered a social determinant of health due to the years of abuse, trauma, and lack of resources that were unjustly imposed on this population, and that have contributed on a broad scale to poor health outcomes (Raphael, 2016).

### 1.6.2 Income and Employment

Income security is one of the most important factors in determining the health quality of populations, more specifically the onset of diabetes (Chaufan, 2004; Martens et al., 2006; Raphael et al., 2003; Raphael, 2016). Income is not only a determinant of health in and of itself, but it is also a determinant of the quality of early life, education, employment and working conditions, and food security. Furthermore, income facilitates a person's quality of housing, social safety net and employment security (Mikkonen & Raphael, 2010). In Canada, it has been shown through a study conducted by Tjepkema, Wilkins, & Long (2013) that out of 2.7 million Canadians, those who are among the poorest 20 percent when compared to the richest 20 percent, have a 150-160 percent greater likelihood of dying from diabetes. If there was no wage gap between the populations, roughly 40 percent of diabetes related deaths could be prevented (Raphael, 2016).

When looking at Ontario's income profile according to the 2011 National Household Survey, the average after-tax annual income for individuals 15 years and over in private households was \$34,284, whereas the average annual income for people who identified as First Nations was \$23,641 (Statistics Canada, 2013). The FNIGC (2018)<sup>2</sup> compared income between their three phases (2002-2003; 2008-2010; 2015-2016) and found that the level of household income under \$10,000 has increased from 11.7% in the first report to 20.3% in the most recent. As a whole across Canada, it can be seen that there exists a wage gap between First Nations populations who live in First Nations communities and those who do not, with 58% of those living in a First Nation community, making less than \$20,000 compared to 20% for their counterparts (FNIGC, 2012). In Ontario, there was a 54% employment rate for on-reserve populations ages 25-64 compared to 75 percent for those who did not identify as Aboriginal (Statistics Canada, 2013). Compared with the rest of Canada, the employment rate for First Nations populations on reserve decreased to 47% and remained relatively unchanged for those who did not identify as Indigenous (FNIGC, 2012; FNIGC, 2018; Statistics Canada, 2013). The unemployment rate for First Nations adults remains markedly higher than that of the general Canadian population with 31.6% being unemployed compared to 7.0%, respectively (FNIGC, 2018). It is pertinent to note that employment status increased with levels of education, with those possessing no certificate, diploma or degree having an employment rate of 33% compared to 65% for those with a Postsecondary certificate, diploma or degree (Statistics Canada, 2013). The FNIGC (2012) highlights areas where 60% of populations living on-reserve experienced difficulty at some point

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<sup>2</sup> Where possible, the 2018 FNIGC report will be used, unless the data is not available or there is a high sampling variability

in meeting their basic living requirements (food, shelter, utilities, clothing, transportation, or childcare). This is a complex issue that contributes to a person's ability to cope with and manage their diabetes (Gucciardi et al., 2009).

### 1.6.3 Food Security

Implicitly linked to income security is the concept of food security, which “exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (Agriculture and Agri-Food Canada, 1998). Food insecurity is a challenge much of the Canadian population faces (Che and Chen, 2001), with over 4 million Canadians living in food-insecure households, including 1.15 million children under the age of 18. This number increased from 2008 by 500,000 (Tarasuk, Mitchel & Dachner, 2014). The prevalence of food insecurity is often underestimated as many surveys do not include populations living on reserves (FNIGC, 2012; Tarasuk, 2016). The FNIGC (2012) through their nation-wide survey, determined that more than half of all on-reserve households are moderately to severely food insecure. Approximately one third of all First Nations adults reported having to borrow money in order to pay for groceries, or skipping meals because food was scarce, and approximately 45 percent of households with children reported being food insecure. Furthermore, geographic location largely plays a role in the level of food insecurity experienced, as many First Nations families, on top of having low incomes, encounter often steep price increases in supermarket food prices due to the efforts of transporting food (Lambden et al., 2006). Multi-child households, lone-parent households, low education achievement, reliance on social assistance and welfare are all circumstances faced more frequently by Indigenous populations and all contribute to food insecurity (Willows et al., 2009). The environment that children grow up in can adversely impact their health status in the

future (Raphael, 2016). In 2011, 28 percent of on-reserve First Nations peoples lived in crowded homes while 43 percent lived in homes in need of major repairs (Statistics Canada, 2013). A high proportion of children live with lone-parents, which has been shown to have a positive correlation with food insecurity (Willows et al., 2009). Surveys conducted from 2006 to 2008 revealed that in isolated communities the recommended nutritious diet for a family of four for one week would cost between \$360 and \$450 (AANDC, 2010; MIAND, 2007; Tarasuk, 2016). Moreover, for people who prefer to obtain their food by traditional methods (hunting and gathering), the cost of fuel, transportation, ammunition, and equipment are major barriers to food security (Boult, 2004). In addition to this, the rapid and increased changes in climate can make it difficult to harvest/gather crops and find prey.

Food security plays an important role in staving off chronic diseases, and none more so than diabetes, of which maintaining a healthy diet, levels of physical activity and a healthy body weight are crucial (Raphael et al., 2012; Rice et al., 2015). Gucciardi et al. (2009) conducted a study across Canada observing the relationship between household food insecurity (HFI) and diabetes and found that HFI was 9.3 percent more prevalent among individuals with diabetes than among those without diabetes (6.8%). They also found that HFI can be an indicator of diabetes diagnosis, as the likelihood of HFI increases by 4% for each year earlier diabetes is diagnosed. In First Nations communities, it is important to understand how the intersection of income, geographic location and availability of healthy food choices underpins the obesity epidemic due to the high cost, poor quality, lack of availability of fresh produce and perishable foods, and influx of snack foods (Willows, 2005). Evidence of this can be seen in a study conducted by Downs et al. (2009) that showed that Cree elementary schoolchildren living with families coping with income insecurity mostly consumed diets of poor nutritional quality and as

such, roughly two-thirds were overweight or obese. Across Canada, when asked about consuming a balanced, nutritious diet, only 23.7% of youth said they “always” or “almost always” ate a balanced diet (FNIGC, 2012). Increasingly abundant in First Nations communities are calorie dense foods and drinks with high levels of fructose (Wharton and Hampl, 2004), which is being shown to have adverse effects more potent to the development of insulin resistance than glucose (Stanhope et al., 2009). These foods are less expensive than nutritious foods and are tasty as they are high in salt and simple sugars, and because of their high caloric content can appeal to people with food insecurity. Because of the demand for these ‘junk foods’, retailers carry them and display them prominently in their stores.

#### 1.6.4 Education, Access to necessities, Environments

The FNIGC (2012) indicates that across Canada, 56 % of populations living on reserve completed a high school education. This was less than those First Nations populations living off-reserve (60%) and the general Canadian population (76%). Furthermore, only 23.7% of on-reserve populations were post-secondary graduates, compared to 40 percent of the general Canadian population. For youth ages 12-17, 21.5% used a First Nations language in their daily lives, and 56.3 percent understood or spoke a First Nations language. Additionally, 86.1 percent believed that learning a First Nations language was “very important” or “somewhat important”. When it came to incorporating cultural teachings, 85.7% of youth felt having traditional cultural events was “very/somewhat important,” with 74.2% taking part in these events. School attendance correlated positively with students experiencing better perceived health and eating a nutritious diet. A correlation exists between levels of education and awareness to health service inadequacies. As the level of education increased, individuals were more likely to identify

barriers to health services that exist, such as lack of doctors, distance to care, wait times for specialists, and culturally appropriate care and services.

Access to high quality care is another social determinant of health that is a basic human right that can impact the onset of chronic disease (Mikkonen and Raphael, 2010) and in terms of Indigenous health encompasses traditional as well as complementing Western health services (FNIGC, 2012). The Indian Health Transfer Policy released in 1979 came in response to pressures of Indigenous groups for self-determination, cultural relevance, and community control of health care at the local level. The long-term goal of this document was to improve health at the community level through the use of community-based and culturally-appropriate methods, while ensuring the federal government maintains its mandatory guidelines for communicable diseases, environmental health, registration of health professionals and emergency planning (Maar, 2004). In 1993, Ontario released the Aboriginal Healing and Wellness Strategy, a policy that utilizes ten ministries and eight Aboriginal organizations, representing all Aboriginal people (including non-status Indians, Inuit and Metis) in order to fund programs designed to foster community-based and culturally appropriate health and mental health care services (Warry, 1998). One of the ways this document sought to increase community-based and culturally-appropriate health care was by the building of Aboriginal Health Access Centres (AHAC), which serve to provide a broad range of health services to Indigenous peoples across Ontario and are able to provide quality care largely through Nurse Practitioners in the community. As of 2010, these health services were no longer managed under the AHWS, but by the Ministry of Health and Long-Term Care (MOHLTC). The Royal Commission on Aboriginal Peoples (RCAP) was another document released in 1996 and outlined several recommendations to improve the health and well-being of Indigenous peoples. One such recommendation included initiatives to address

social, educational, health and housing needs and the training of 10,000 health professionals over a ten-year period; however, these promises were not adequately being met (Hurley and Wherrett, 2000). In 2015 the Truth and Reconciliation Commission (TRC) released 94 recommendations designed to readdress the shortcomings of earlier efforts and to make amends for the disparities faced by Canada's Indigenous communities. Of these 94 recommendations, seven are specific to health and are designed to build on the recommendations found in the RCAP. These recommendations include acknowledging the federal government's role in policies and residential schools, as well as recognizing Indigenous rights to health care. Furthermore, the TRC advocates for measurable goal setting and progress reports to aid in closing health inequity gaps, addressing the health needs of Metis, Inuit and off-reserve peoples, respect for Indigenous healing methods, increase in Indigenous health professionals and cultural competency training, and sustainable funding for new and existing Indigenous health centres (Smylie and Firestone, 2016). This project seeks to address the recommendations that will aid in measurable goal setting and progress reports, as well as respect and advocacy for Indigenous healing methods. According to Maar (2004), while the transfer of many health services from the Canadian government to Indigenous Governing Boards, and the creation of AHACs is a positive step forward in terms of the inclusion of culturally relevant programs, many of these communities must operate within rigid boundaries set forth by the different funding agencies both provincial and federal. Many of the health programs are challenged by these constant fluxes, particularly with a high turnover of staff and a lack of consistent physician attendance within programs, often leaving clients without adequate or consistent treatment. Barriers that are often encountered by First Nations populations living on reserve include difficulties accessing traditional medicine (25%), access to health services (40%), Non-Insured Health Benefits not being comprehensive enough (17%), and

excessive wait times (32.4%) (FNIGC, 2012). It is also unsurprising that the most common condition people sought care for was diabetes (89.7%) (FNIGC, 2012). One major concern patients have is not being able to see a family physician or specialist in a timely manner. A study by Deved et al. (2013) explored clinical outcomes and determined deficiencies in the assessment quality indicators and achievements of A1C targets among First Nations populations compared with non-First Nations populations, due in part to reduced access to generalist and specialist care.

A lack of physical activity and poor eating patterns are often cited as main culprits in explaining high levels of obesity in Indigenous populations, but often overlooked is the built environment that many children live and grow up in that impedes the adoption of these healthy behaviours (Willows et al., 2012). The built environment plays a key role in initiating and maintaining positive changes to diet and physical activity (Duncan, Spence & Mummery, 2005). Children and youth ages 5 to 17 should be aiming to accumulating 60 minutes of moderate to vigorous physical activity each day (Diabetes Canada, 2018). It is interesting to note that meeting this minimum threshold for physical activity may not indicate substantially greater health benefits and, as such, the emphasis should be placed on simply moving more and sitting less (Warburton and Bredin, 2017). According to the FNIGC (2012) 61.9 percent of children aged 6-11 were active; however, it is important to note that the amount of sedentary time increases with age. Not only does the physical environment contribute to nutritional opportunities (in terms of access to healthy nutritional food/traditional diets) (FNIGC, 2012; King et al., 2009), but it impacts how individuals participate in physical activity and other healthy behaviours (Willows et al., 2012). The built environment can include walkways, neighbourhoods, the presence of grocery stores, convenience stores, school meal programs, parks/recreation areas as well as transportation (Sallis and Glanz, 2009). The literature documenting environmental effects on obesity are limited

(Willows et al., 2012); however, a study conducted by Black, Raine and Willows (2008), explored barriers pregnant women faced while living on a First Nations reserve. Some of these included accesses to healthy food options, the presence of unhealthy food, income as a limiting factor, the lack of indoor facilities, weather, and unsafe neighborhoods due to dog attacks.

## 1.7 Interventions Used in First Nations Communities

Research done by Ebbeling, Pawlak and Ludwig (2002) indicates that for interventions to have optimum success, social as well as environmental influences must be taken into consideration, otherwise they stand to have little impact. These include family interventions with healthy meals, activities and reduced television viewing, school funding for physical education, lunch programs, elimination of unhealthy foods (soft drinks, candy from vending machines) and adoption of healthy alternatives. Ebbeling and colleagues take these further to argue that interventions need to address the environments that populations live in, including redesigning urban spaces to accommodate playgrounds and safe areas, increasing health coverage for obesity treatment, taxation on fast foods and subsidies for nutritious food, and regulating political contributions from the food industry. In addition to this, communities must be involved in the interventions, through a process often referred to as Community-Based Participatory Action Research (CB-PAR)<sup>3</sup>, which seeks to involve the community in every step of the process as equal partners. Two well-known case studies that attempt to tackle obesity from this broad lens that pioneered many modern Canadian interventions are found at Kahnawake and Sandy Lake (Willows et al., 2012).

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<sup>3</sup> CB-PAR was a key component of this study and will be explored in further detail in section 3

### 1.7.1 Kahnawake

The Kahnawake Schools Diabetes Prevention Program (KSDPP) was a community-driven program established in 1994 in the Mohawk community of Kahnawake located near downtown Montreal, Quebec (Board, 2003; Horn et al., 2007). This program was developed as a means to tackle the issue of diabetes and break the notion that it was a “mysterious disease,” to one that is preventable, with community awareness, partnership and engagement (Bisset et al., 2004). This program was built on a socioecological approach to achieve healthy weight gain (Cargo et al., 2003; Bisset et al., 2004; Paradis et al., 2005). The goal of the program was to increase diabetes awareness through the education curriculum for children, reconfiguring the school’s nutrition policy to foster a supportive environment for healthy eating in school (ban on junk food brought onto school property), school and classroom activities to support healthy living for parents, teachers and children, community activities (walking clubs/paths, cooking lessons, community gardens, contests, dancing, diabetes summer camps), and training for native staff and volunteers including community members (Kakekagumick et al., 2013; Paradis et al., 2005). Throughout these programs, an emphasis on cultural relevancy and integration was evident (Delormier et al., 2003). Evaluations conducted found that the interventions were deemed not entirely successful, as early positive results were not sustained over an 8-year evaluation process (Paradis et al., 2005). Possible explanations involve the increasing obesogenic environment consisting of a higher availability of television with thousands of commercials promoting unhealthy foods, coupled with increased disposable income and availabilities of fast-food restaurants, and unstable family environments (Paradis et al., 2005). Consistent with Ebbeling, Pawlak and Ludvig (2002), the broad environment that children live in can have great implications for the successes of

programs. Nevertheless, the KSDPP remains committed to reducing obesity among children and continues to adapt its programs (Willows et al., 2012).

### 1.7.2 Sandy Lake

Sandy Lake First Nation is a remote community consisting of Oji-Cree populations in the Sioux Lookout Zone in northern Ontario. After identifying the high prevalence of diabetes among its populations (26.1% age standardized), the Sandy Lake Health and Diabetes Project (SLHDP) was created in 1993 (Harris et al., 1997). This program was a comprehensive community-based approach that used participatory research to reduce obesity and diabetes prevalence. Activities included radio programming that highlighted healthy lifestyle activities, healthy food labeling at local grocery stores, health promotion activities during community gatherings, home visits to aid in healthy food preparation, development of walking clubs and trails as well as increased opportunities for children and youth to engage in physical activity (Willows et al., 2012). According to Saksvig et al (2005), from 1998 to 1999 a 1-year pilot program was carried out called the Sandy Lake School-Based Diabetes Prevention Program (SBDPP), which was a culturally relevant program that sought to increase awareness and healthy eating practices among children. This program centered on the socioecological model as well as social cognitive learning in order to address the social determinants of health that contribute to obesity and diabetes. For children in grades 3 to 5, culturally relevant lessons on the importance of eating healthily, exercising regularly and diabetes education were key components. Older peers were trained to be role models, physical activity opportunities were increased, and healthy lunch programs were instated, with the banning of high-fat and high-sugar snacks. Overall, an evaluation revealed that children had successfully reduced total fat intake, met daily fibre recommendations, and increased their knowledge and self-efficacy with respect to healthy food options, overall health

knowledge and proper eating. No reduction in obesity in the children was noted, as body mass index and body fat percentage increased. Researchers felt the 1-year timeline was not sufficient to see changes in body mass index. However, this program has been adopted and utilized by many First Nations communities (Willows et al., 2012).

### 1.7.3 Current Research in Canada

This section will highlight the work identified by Rice et al. (2015), who conducted a systematic review in order to identify ways of improving the screening, treatment, prevention and management of type 2 diabetes and obesity-related chronic disease in Indigenous communities in Canada from 2008-2014, with the goal of identifying best practices. This study was designed to aid efforts already being carried out in communities. According to Rice and colleagues, the call for increased research into improving interventions according to the findings of other studies, is overwhelming. It was identified that socioeconomic marginalization of Indigenous communities, and other barriers listed in preceding sections of this document, have caused many interventions to fail, largely in part to the lack of cultural awareness and models of health and wellness that permeate the lives of Indigenous peoples. In 2013, a world-wide systematic review by Saini (2013) of all randomized control trials (RCTs) carried out in Indigenous communities between 2000 and 2010 found that 22 studies met the researchers' criteria, with 6 studies being found in Canada. This was an improvement, as Morris (1999) found only 13 studies in a similar study from the periods of 1970 to 1999, with no studies being found in Canada. McNamara et al., (2011) in a twenty-year review period (1988-2008), identified only 5 Canadian studies and cited numerous limitations in the study designs and an urgency to increase the amount of intervention research.

Rice et al., (2015) conducted their review from 2008 onwards in an effort to identify interventions not covered by McNamara and colleagues. Using Medline, EMBASE, PubMed and Google Scholar, RCTs as well as other studies containing qualitative and quantitative components were included, irrespective of design. The criteria to be included in the review was as follows: 1) have a baseline for comparison; 2) have incorporated an intervention aimed at reducing the incidence of diabetes, reducing rates of obesity and/or body mass index (BMI), improving blood sugar or blood pressure, or increasing physical activity or knowledge about fitness and/or healthy eating habits, or some combination of these; and 3) have evaluated the efficacy of that intervention. The study produced 17 publications that fit the selection criteria (13 unique interventions and 4 that were mentioned in multiple publications). Out of the 13 unique interventions, 7 were school-based programs that focused on children, with various components incorporating the larger community (walking trails, newsletters sent home to caregivers). A summary of these studies can be found in (Appendix A).

## 1.8 Purpose and Overview of the Research

Rice et al., (2015) identified that the most successful interventions were the ones that included and had the support of the communities in all aspects of the research process and utilized members of the community to carry out the interventions. Other successes of the interventions included a focus on children, which included mentorship programs and school-based interventions. All interventions addressed the historical and social underpinnings of colonization and discrimination that impact Indigenous health-care. All but one intervention utilized community-based participatory action research, suggesting that this method is highly necessary and is the gold standard of research practice. It was concluded that more intervention research must be carried out in Indigenous communities in order to identify best practices that other

communities can follow. Integral to reducing obesity and obesogenic diseases in Indigenous communities is the idea that cultural components must be incorporated in order to achieve the maximum benefits (Smylie, Kaplan-Myrth & McShane, 2009).

I was invited to partner and conduct research with Garden River First Nation in order to help address the need expressed by Rice et al., (2015) that more research in Indigenous communities is required to better understand what makes an effective intervention. This community has successfully implemented their own obesity and diabetes prevention program for children and youth and has had it in place for over 11 years. By partnering with this community, valuable insights may be provided as to what is needed to design and implement a program like this. The goal of this research was to aid the community in evaluating and, if necessary, improving their existing program, as well as provide tools and insights necessary for another community to implement their own program. This research utilized a qualitative case-study approach using semi-structured interviews/conversations with key informants (staff at Garden River). The implications of this research are that valuable insights were provided by staff who have experience designing and implementing a successful, evidence-based obesity and diabetes prevention program for First Nations children and youth. These insights can be used by the community to make improvements where necessary. Furthermore, these insights may be beneficial to communities that have similar interests and desires and are in need of guidance.

## 1.9 About the Community

The Garden River First Nation Reserve was formally created under the Robinson Treaty of 1850. The Robinson treaty was signed by Chief Shingwaukonce, who also acted as signatory to the 1825 Treaty at Prairie du Chien between the United States and the Chippewa Nations and was

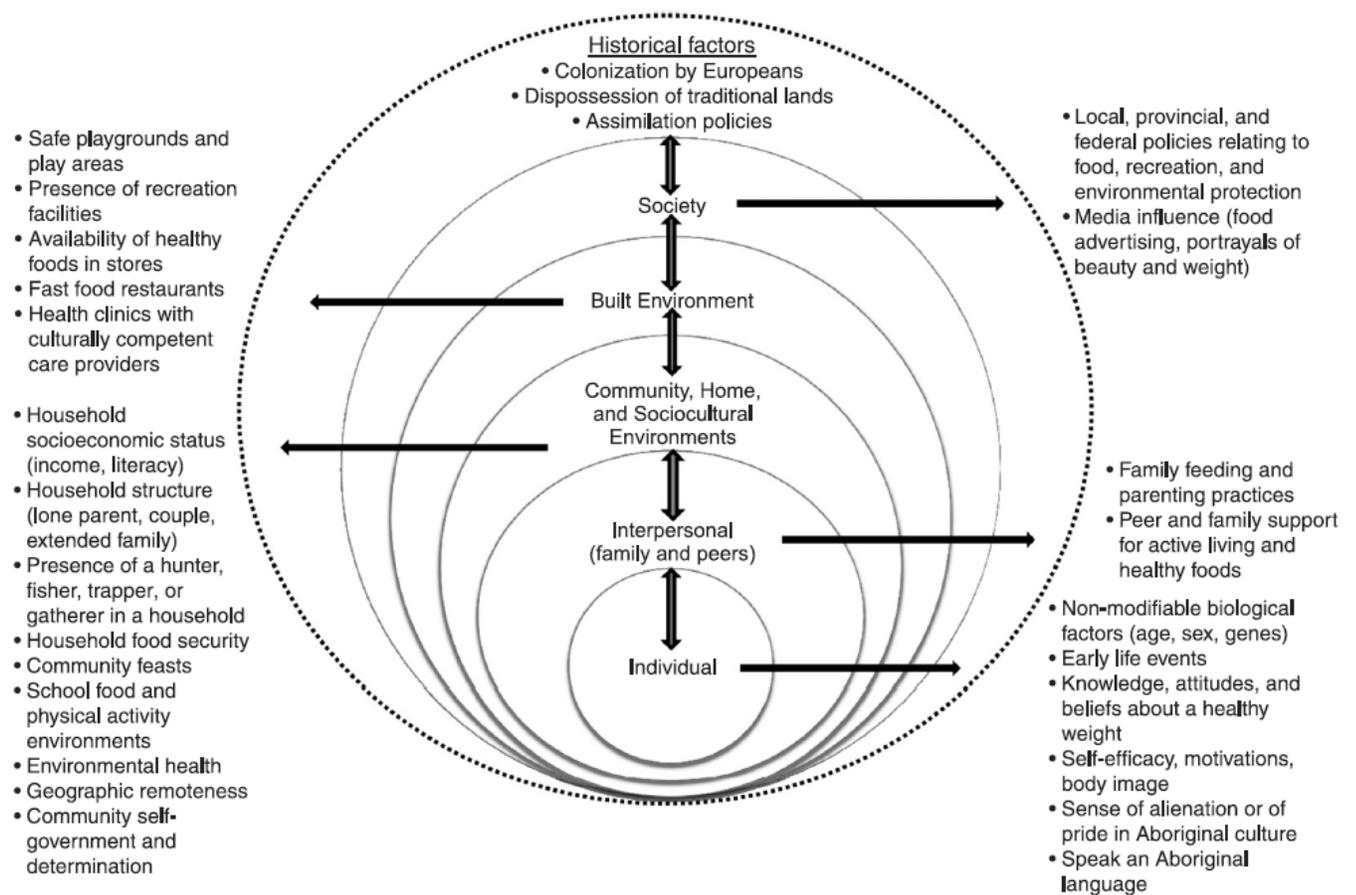
recognized as the head Chief of the Tribe (Welcome to Garden River, 2018). The treaty was developed by the government of Canada in response to opposition from Chief Shingwaukonce to unlawful surveying and harvesting of resources on Indigenous land. The land to be purchased was the north shore of Lake Huron and the mining sites along the eastern shore of Lake Superior with a budget of £7500 (Leighton, 1975). Faced with the threat of receiving nothing, and the promise of payment, annuities, and hunting and fishing rights, Chief Shingwaukonce and the other chiefs ceded ownership of the North Shore (Surtees, 1982). Chief Shingwaukonce is regarded as a very notable and influential figure in the community and his desire to see his community thrive permeates through the community now in the way they provide opportunities to the community. Chief Shingwaukonce's tales of fighting alongside General Brock, defending his homeland from the United States of America, fighting for rights for his people and walking to Toronto to advocate for a teaching wigwam for his community speak to the progressive nature of the community. The community prides itself on proactively seeking opportunities to better the lives of the approximately 1200 people who call Garden River their home and is evident in the number of programs that are offered. The community is located approximately 25 minutes from Sault Ste. Marie, Ontario, Canada, and is one of seven communities that are part of the North Shore Tribal Council (NSTC). The NSTC is an organization that seeks to assist and facilitate the activities of the member communities (Garden River, Batchewana, Thessalon, Sagamok, Mississauga, Atikameksheng, Serpent River). The NSTC strives to promote cultural, spiritual, economic, political, environmental and social well-being for these communities by researching, developing and delivering programs, providing advisory services to member communities, and providing political support (Mamaweswen, N.D). Garden River is equipped with a health and wellness centre as well as a recreational centre, where most health-related programming takes

place. The health services department employs about 15 staff. There is also a partnership with Mamaweswan (North Shore Tribal Council) through the N'Mninoeyaa Aboriginal Health Access Centre that provides physiotherapists, occupational therapists, nurse practitioners, dieticians, community health promoters and programming through provincially funded models.

## Chapter 2: Frameworks

Two frameworks will inform this thesis in the way that obesity and, more specifically, diabetes is understood in Indigenous communities. Together, the Socioecological Model and Life Course Theory frame the complex array of environmental, social and political factors that influence the prevalence and age of onset of obesity and diabetes in Indigenous communities. These models will be used as guiding principles that will bring understanding as to how the social determinants of health coincide with the ways Indigenous children and youth grow up, and how events that occur in their life can influence the onset of diabetes in later years.

## 2.1 Socioecological Model



**Figure 1** Socioecological model for understanding obesity in children, which illustrates the reciprocity among levels that influence active living, the consumption of healthy foods, and weight status, and which recognizes that historical factors encompass and influence every aspect. (Willows et al., 2012)

The Socioecological model put forth by Egger and Swinburn (1997) was designed to identify and contextualize the many factors that foster and contribute to obesogenic environments in populations. These factors include the physical environment, economic environment and sociocultural environment that influence weight status. These factors are often broken down into “macro” (implications for the whole population, such as policy surrounding food technology,

food taxes, traditional cuisine) and “micro” (in close proximity to the individual such as food in home/school, family income, and family eating patterns). The macro environment is said to create the conditions that dictate the prevalence of obesity in a population, whereas the micro environment, along with biological and behaviours, determines whether an individual is obese. The social determinants of health are included in this model in order to show the interactions between various levels of society (Willows et al., 2012).

This particular model (Figure 1) will be used as a framework for situating the various causes of obesity and obesity related diseases such as diabetes in a First Nations context. This model uses social determinants of health to help explain why First Nations populations face disproportionately high rates of obesity and diabetes, as covered in previous sections. The individual is acted upon by their macro and micro environments, which are linked, and each exerts a particular pressure that can either contribute to or alleviate the onset of diabetes. The stacked Venn diagram illustrates the overlapping relationships that can impact an individual on a conscious or subconscious level. The bidirectional arrows indicate that each level is related and influences the others before and after it. This model allows for the incorporation of biological traits, cultural views, as well as a wholistic model of health that is central to the Indigenous way of viewing health (physical, emotional, spiritual and mental) (AHACR, 2015), and is nested in broad social and historical contexts unique to this population (e.g. colonization, assimilation, and Westernization).

## 2.2 Life Course Theory and Diabetes

**Table 1:** A summary of life course principles

<b>Principle</b>	<b>Description</b>
First Principle	Human development and aging are lifelong processes
Second Principle	Outcomes, events and behaviours can change depending on where they occur in the lifespan
Third Principle	Historical and social context surrounds the lifespan
Fourth Principle	Individuals construct their life course through choices within the historical and social contexts
Fifth Principle	Lives are interdependently linked

Life course theory was developed as a means to account for the ways events that occur in the lives of individuals can impact their growth and development (Raphael, 2016). According to Elder, Johnson and Crosnoe (2003), the first principle states that human development and aging are lifelong processes. Developmental processes do not end at age 18. The idea that adults and children experience biological, psychological and social changes that can affect developmental change in their life-span is a fundamental tenet (Johnson, 2001). These principles can be applied to longitudinal studies to compare how changes across the life-span can impact growth and development. The second principle states that the outcomes of life transitions, events and behaviour patterns can change depending on when they occur in a person's life. The same experience may impact individuals differently depending on when they occur in their life course. The third principle posits that the life course of individuals is formed by the historical times and

places they experience over their lifespan. Geographical location, culture and investment with meaning and value shape every place. Each event that happens can be interpreted by different populations differently and can have impacts that vary as a result (Gieryn, 2000). The fourth principle states that individuals construct their own life course through choices and actions taken in response to the historical and social circumstances that surround them. Individuals have the opportunity to make key decisions within the constraints of their social environments that can set them on certain trajectories. The fifth principle posits that lives are linked, meaning they are lived interdependently and reflect socio-historical influences through various relationships. This principle is used to explain how broad social constructs (macro level) impact lives on a micro level (Conger & Elder, 1994). This principle can also be used to explain how lives of individuals can affect the life course of those around them, bringing to light the importance of relationships in a person's life course. While life course is well documented in fields concerning psychology, sociology, neurodevelopment and anthropology (Ben-Shlomo and Kuh, 2002), it has been expanded to account for chronic disease events as well (Halfon et al, 2014; Hertzman & Boyce, 2010; Huchcroft, 1998; Lynch & George, 2005; Raphael 2016; Willows et al., 2012).

The idea that life course can be applied to the onset of chronic disease has gained momentum over the years as evidence has uncovered how events in various stages of life guide the diagnosis of diseases such as coronary heart disease, stroke, chronic bronchitis and NIDDM (Huchcroft, 1998). Chronic disease contributed to approximately 46% of the global burden of disease in 2002 and is expected to grow to 57% by the year 2020, incurring huge costs for healthcare, societies and governments (Epping-Jordan et al., 2001). What is even more disturbing is that chronic diseases such as diabetes have been manifesting in younger populations, indicating why this disease has lost the distinction of being "adult-onset" (Darnton-Hill, Nishida & James, 2004).

These younger onset patients are having an increased risk for complications, in particular, needing dialysis (Komenda et al., 2015). Thus, chronic diseases such as diabetes are no longer a simple matter of genetics or poor lifestyles, but a complex interplay of environment, biology, lifestyle, policies and social aspects that influence the diagnosis at any stage in the lifespan. Ben-Shlomo & Kuh, (2002) have defined a life course approach to dealing with chronic disease epidemiology as the study of “long-term effects on chronic disease risk of physical and social exposures during gestation, childhood, adolescence, young adulthood and later adult life” (p.285). Some of the work put forth by Forsdahl (1977), Barker et al. (2001) and Wadsworth (1991) helped to pioneer the DoHAD hypothesis that looked at the processes the fetus undertakes when adapting to intrauterine environments that could lead to the onset of diabetes. These ideas and many more across the lifespan can be used to study biological, behavioural and psychosocial trajectories that operate in an individual’s life course that influence the presence of diabetes at some stage in their life. The principles of life-course theory, originally applied to sociological research, have since then been expanded and applied to the study of epidemiology and the specific study of diabetes. The scope of this section is to provide a snapshot of some of the ways these five major principles can influence the onset of diabetes in Indigenous populations.

The first principle of life-course posits that development occurs over the entire lifespan (Elder, 1977). Applied to health, this means that at any point in the lifespan, an individual may be moving towards positive health outcomes or negative health outcomes. Going even further, this principle can be applied to the diagnosis of diabetes, that at any point in the lifespan an individual can be moving towards diabetes diagnosis, or away from it, which is especially true for those who have a family history of diabetes (CDA, 2018). Over nutrition levels during gestation can lead to an increased risk of diabetes, by conditioning the fetus to an overactive

response to nutrients, particularly glucose (Leon et al., 1998). In childhood development, high blood pressure has been known to manifest and be tracked throughout the lifespan, contributing to glucose intolerance, leading to diabetes (Rich-Edwards et al., 1999). Obesity in adolescence has been known to be tracked and manifest more in adult years. The obesogenic environment has been largely observed in adolescents with the availability of unhealthy, prepackaged foods and an inactive lifestyle (watching excessive TV, reduced time outside etc.) which can contribute to diabetes diagnosis (Dietz, 2001). During adult years, the accumulation, and further adoption of unhealthy behaviours associated with poor nutrition, lack of physical activity, high cholesterol, high blood pressure, etc. can, and does contribute very strongly to diabetes, as shown in a study that tracked the effects of physical activity on chronic disease (Davey et al., 2000). In older years, in addition to the affects attributed to health behaviours, the body systems begin to fail and shut down; for example, declining kidney function and reduced blood filtering can often contribute to the proliferation of diabetes by means of a positive feedback loop (CDA, 2016).

The second principle of life course deals with the idea of trajectories and transitions, and how an experience that occurs can have different effects at different stages (Elder, 1985). Using the work of Hertzman and Power (2006), there is the idea of trajectories that are comprised of latency, pathway and cumulative relationships. Latency refers to an exposure that happens at an early stage in the life course that influences a developmental outcome many years later, regardless of intervention. When looking at the diagnosis of diabetes, 48 studies examined the association between high birth weight and diabetes in later life with in-utero environments and found a positive correlation. This was brought on by excessive nutrients being provided to the fetus by mothers with pre-diabetes or diabetes and high blood glucose levels, that created an adaptive response to glucose and a gradual intolerance leading to diabetes in the adult years (Lynch and

George, 2005). Herring and Oken (2011) found a relationship between maternal weight and diabetes in Indigenous women as being a factor in determining the onset of diabetes in the life of their infant. Furthermore, Young et al. (2002) found that maternal diabetes was the strongest predictor for the development of diabetes among offspring. Dyck et al. (2010) also found that gestational diabetes was a strong predictor of diabetes in the offspring, creating an intergenerational risk for diabetes.

Pathway events refer to dependent sequences that occur in the lifespan that influence the possibility of that outcome recurring, as well as others happening. An example of this can be found in a patient who forgoes taking their medication as a means to manage their sugar intake out of convenience or comfort. This could cause that action to be repeated at some point later in the lifespan, as the patient may have felt that it was okay to skip their medication because they did not consume any bad food (FNIGC, 2012). This pattern could influence the onset of many more behaviours that neglect the management of blood glucose levels, contributing to the diagnosis of diabetes (Glanz and Bishop, 2010). Lastly, cumulative events refer to multiple exposures over the lifespan whose effects combine. Examples of this are chronic poverty, poor nutrition, lack of availability of resources, etc. As mentioned previously, a life of poor nutrition and lack of physical activity can contribute to obesity and diabetes diagnosis. These events that occur over the lifespan vary in the way they manifest. The idea of social and historical constraints must be considered in order to understand why diabetes affects populations, particularly Indigenous populations, disproportionately.

The third principle of life course posits that development occurs within historical and social contexts (Elder, Johnson and Crosnoe, 2003). This issue becomes paramount when understanding the disparities Indigenous populations face. The events of colonization,

Westernization and assimilation had, and continue to have profound impacts on Indigenous health by reducing lifespan, increasing the rate of chronic disease, and increasing mental health issues and mortality (Smylie et al., 2004). Colonization and assimilation have sought to destroy Indigenous peoples' way of life, making it extremely difficult to live a healthy, self-sustaining life, as was practiced for hundreds of years (Alfred, 2009; Sotero, 2006). Residential schools were set in place as a primary determinant for assimilating Indigenous children into Western culture, and effectively sought to abolish traditional and cultural teaching and practices (RCAP, 1996). According to the National Aboriginal Health Organization (NAHO, 2003), 64% of First Nations respondents identified loss of traditional land and culture as significant contributors to poor health. Colonization of Indigenous lands has led to many Indigenous families being displaced to remote locations known as reserves, that often have poor soil for growing crops and a lack of sufficient fauna to practice traditional ways of life (hunting/gathering) as a source of food and physical activity (Kelm, 1998). Smylie and Anderson (2006) state that because of colonization and assimilation into a Western lifestyle, medical treatment for Indigenous people is often scarce and health information incomplete. Within these constraints, Indigenous people have limited choices when it comes to their health.

According to the fourth principle, the idea of agency exists for people to construct their life course within the social and historical constraints that surround them (Elder and Shanahan, 2006). Looking at how colonization, Westernization and assimilation have affected Indigenous peoples, one can look at how the social determinants of health impact livelihood (Raphael, 20016). According to Loppie-Reading and Wien (2009), Indigenous populations face disproportionate difficulties when dealing with issues of poverty, housing, food insecurity, geographic isolation and access to health care, which have been shown to contribute to the

diagnosis of diabetes. A study conducted by Green et al. (2003), found that areas with the lowest socioeconomic status had the highest levels of type 2 diabetes. These areas had the highest concentration of Indigenous people. Assimilation through the *Indian Act* and residential schools have limited the options Indigenous peoples have in terms of food selection. By removing the source of traditional ways of life by relocating and assimilating, Indigenous people have been forced to adopt a Western diet, which often consists of low quality nutrition and has been shown to increase the prevalence of diabetes (Raphael, 2016). The physical environment that many Indigenous populations have been forced to live in for many years is one that limits food choice (number of grocery stores available, price of food, availability of snack foods) and physical landscape and recreational centres for physical activity (Duncan et al., 2005). A study by Smoyer-Tomic et al. (2008) found that Indigenous populations were most likely to live in low income areas and be exposed to more fast-food restaurants than those living in higher-income areas. The integration of Western medical systems has created a further limitation of health choices, as many have come to rely on Western medicine for healing which is often scarce and devoid of any cultural competency (Willows et al., 2012).

The fifth principle posits that under the broad social structures, the familial life is impacted, as lives are interdependently linked (Elder, Johnson and Crosnoe, 2003). According to the RCAP (1996), under the broad implications of the *Indian Act* and residential schools, the lives of Indigenous families have been affected through many generations. Due to the implications and actions of residential schools, thousands of children were removed from their households and were sometimes physically, mentally, sexually and emotionally abused in an effort to remove any traces of traditional and cultural practices. This has disrupted the familial bonds of 4 to 5 generations of Indigenous children, effectively making the adoption and transfer of healthy

behaviours and the abandonment of unhealthy ones very difficult through a loss in parenting skills (FNIGC, 2012).

According to the FNIGC (2012), Indigenous children are more likely to live with a lone parent, in addition to the household median income being \$18,962, or \$8,135 less than the Canadian average (Statistics Canada, 2013). This undoubtedly shapes how parents are able to provide for their children in introducing healthy foods, or enrolling them in healthy activities, which are often expensive and difficult to find in remote locations (Hill, 2002). Delormier (2010) studied family eating patterns in Indigenous households with the Mohawk community of Kahnawake and found a correlation between childhood obesity and obesogenic diseases [diabetes] as a result of social implications brought on through historical events, which have shaped the environment that these children have grown up in, creating the ideal obesogenic environment.

## Chapter 3: Methodological Approach

This chapter outlines perspectives that helped to guide this research and inform the study in its entirety. This research seeks to purposefully include and highlight the voices of individuals who live and work in Garden River First Nation and who can offer key insights of the emic nature on the specifics of the program (Hampshire et al., 2009). As the outsider with no foreknowledge of the program specifics, I can thereby help to offer an etic perspective on how well the program functions through analysis of these voices. Key ideas in this section include the use of the Indigenous Research Paradigm, Community Based Participatory Action Research, the Socioecological Model with incorporation of the Medicine Wheel, and Life Course Theory. The methodological design will be embedded throughout the sections as they coincide with the various underpinnings of the Indigenous Research Paradigm (Wilson, 2001). I decided to utilize an Indigenous Research Paradigm to ensure the approaches that I took in the conversational process allowed for respondents to incorporate their views which, based on preliminary conversations, incorporate wholistic concepts and underpinnings in their daily lives, as well as in the program in question. Understanding that knowledge translation from an Indigenous perspective often varies from that of mainstream research, will allow me to best capture the voices of my respondents.

In keeping with the five principles of life course theory, one that is of particular note in this setting is that of *agency*. Indigenous populations have not only been taken advantage of historically through the events of colonization and Westernization, but also through research methodologies as well. In many situations, research was conducted without their consent or approval and in ways that were not honouring to the beliefs and ideologies held. By incorporating an Indigenous Research Paradigm whenever possible and adhering to the

principles outlined below I hope to conduct this research in a manner that seeks to do no harm and allows for respondents to inform me of their knowledge in a relational manner that facilitates their active participation in the research project as a whole.

### **Research Question**

*What do healthcare staff at Garden River First Nation believe makes an obesity and diabetes prevention program successful?*

## **3.1 Situating Myself in the Research**

In order to conduct this research in a way that is honouring to the community that I am working with, I will situate myself in the research in order to recognize any bias I may be bringing into the research (Chilisa, 2012). I am the son of parents who immigrated to Canada from Sri Lanka. Being born in Canada, I identify myself as being Canadian, although I am not sure what that truly means, other than the fact that this identity is a construct derived from the various cultures that have influenced my growth and development. My parents come from a country that was a British colony, and as a result mainly speak English. I did not begin to understand that there is very little I know about my cultural roots until fairly recently. I do not know my native tongue (Tamil) and I have no real ties to my parents' homeland. As I have grown up and have learned of the ways my parents' culture was stripped away and the ways this has impacted my growth and development, I began to become more aware of the ways colonization and Westernization have gravely impacted Canada's Indigenous population. My desire to work with this population stems from a desire to see restitution to the many lives that have been damaged by these forces. I acknowledge that I am an outsider conducting research with a First Nations community, and as such, seek to do so by evoking methodologies that are decolonized and by employing Indigenous

world views and maintaining the utmost respect for the people that have allowed me to partner with them.

My desire to research diabetes among Canada's Indigenous children and youth stems from my experiences at a First Nation in northern Ontario, where I spent five summers helping to run camps for Indigenous families. It was during this time I began to notice the high rates of obesity and obesogenic diseases that ran through this community's young people in conjunction with the fact that geographic location placed this community almost an hour's drive from the nearest grocery store, or consumer hub. Income security, education, geographic location, food security, and Indigenous ancestry were all terms I would later come to associate as the *Social Determinants of Health*. It is my desire to understand how these factors have impacted and continue to impact other First Nation communities. I hope this research aids in uncovering some of the ways First Nations have begun to fight back against obesity and obesogenic diseases by addressing these determinants.

## 3.2 Guiding Principles:

### 3.2.1 Indigenous Research Paradigm

This research seeks to adopt a paradigm that is consistent with the worldviews of Anishinabek<sup>4</sup> people of northern Ontario. A paradigm outlines a way that groups of people (researchers, scholars, communities, etc.) see and understand the world. (Chilisa, 2012; Creswell and Poth, 2017). The paradigmatic approach to be taken will be the Indigenous Research Paradigm (Chilisa, 2012; Wilson, 2008). According to Chilisa (2012), this approach seeks to decolonize traditional methods of research. By incorporating the views of those who represent oppressed

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<sup>4</sup> The term Anishinabek is an Oji-Cree word that means "the people"

and colonized populations; histories, worldview, ways of knowing and experiences unique to the population are legitimized. Key areas to be explored in this paradigm in a research setting include *ontology* (nature of reality), *epistemology* (how the reality is thought about), *methodology* (how to use these ways of thinking), and *axiology* (set of morals and ethics); all of which hinge on the relationality between all entities, both living and non-living (Wilson, 2001; Wilson, 2008). Within this paradigm are two key concepts, the Indigenous Wholistic Theory and the Medicine Wheel, that will inform the methodological approach and the way this study is thought about. This paradigm also supports the idea of framing interviews as conversations, as a way to promote relationality with respondents as key partners in the research and not merely subjects (Kovach, 2010).

### 3.2.1 Indigenous Wholistic Theory

The Indigenous Wholistic Theory is widely used in research literature and serves as a basis for those wishing to conduct research with Indigenous communities and people (Marsden, 2005). Absolon (2010) articulates that this theory seeks to incorporate cultural and traditional knowledge and teachings and is built on anti-colonial perspectives. This theory is used to ensure that Indigenous communities and peoples are not generalized into Euro-Western research practices and dogmas. Within this theory, the individual is comprised of a spiritual, emotional, mental and physical nature that is reflective of the traditional teachings embedded within the natural environment (sun, water, sky and all of Creation). This theory is useful for dealing with issues with research that historically removed the voice of those involved in research, by empowering individuals who represent this population to speak into the study in its entirety. Kenny (2004) further articulates that a wholistic model in Indigenous research seeks to honour time as past, present and future, honours spiritual, physical, emotional and mental aspects of

human beings; and honours the interconnectedness of all things. This theory will be used to address the key areas of the Indigenous Research Paradigm surrounding *ontology*, *epistemology*, *axiology* and *methodology* to allow for representation of the entire being.

### 3.2.2 The Medicine Wheel

The medicine wheel is a visible representation of balance and interconnectedness that permeates the Indigenous world view (Graham & Leeseberg Stamler, 2010). The Medicine Wheel may have different symbols and meanings for different First Nations, but has universal principles and is rooted in culture and traditional teachings (Absolon, 2010). Similar to the Indigenous Wholistic Theory, the circular representation of the medicine wheel encompasses a wholistic demarcation of the human being; one that is rooted in context and interactions of the spirit, emotional, mental and physical aspects (Svenson and Lafontaine, 2003). Within the Medicine Wheel, balance between these four elements denotes health and wellness (Lavallee, 2007). The Medicine Wheel guides this research project, as it embraces a viewpoint contrary to that of the dominant society (Absolon, 2010) and acknowledges that while diabetes is a physical manifestation, the respondents and community of Garden River embrace the balance of these elements to signify health and wellness.

### 3.2.3 Ontology:

Ontology according to Chilisa (2012) “is the body of knowledge that deals with the essential characteristics of what it means to exist” (pg. 20). The particular body of knowledge that will be acknowledged in this project is that health from an Indigenous perspective is wholistic, encompassing the spiritual, emotional, mental and physical nature of human beings (AHAC, 2015; Smylie et al., 2004; Willows et al., 2012). While this project deals with the physical

manifestations of diabetes, the reality of it within the Indigenous Wholistic Theory is that all aspects of the human must be taken into consideration when understanding how diabetes manifests as well as presents itself.

Research questions were selected on the basis that this is an original research project and, in keeping with the guidelines set forth by Wilson (2008), was meant to be unique to this population and served to extract knowledge that the community would want to know and share. These questions were developed by myself and refined with input from my supervisory committee as well as the health director and supervisor in the research community. The questions endeavored to seek answers that draw on the Indigenous research paradigm for knowledge seeking in a manner that seeks to remain true to Indigenous ways of understanding and applying that knowledge (Chilisa, 2012). The questions followed principles outlined by Cross et al (2000) and Chilisa (2012) regarding the incorporation of concepts from the medicine wheel (context, body, mind, spirit). *Context* refers to culture, community, family, peers, work, social history, school, etc. *Mind* refers to the cognitive process, involving thoughts, feelings, memories, knowledge and emotional processes such as feelings and self-esteem. *Body* refers to physical aspects such as genetic inheritance, gender and nutrition. The *spirit* includes positive and negative learned teachings and practices (Mertens, 2009). See (Appendix F) for the conversation guide. Questions were designed to address these components while allowing respondents to have an open dialogue and take the conversation in whichever direction they felt was best.

### 3.2.4 Epistemology:

Epistemology according to Chilisa (2012) seeks to uncover the nature of knowledge and truth by asking what or who are the sources of knowledge, and the types of evidence used to prove that knowledge or truth. This research employed a *relational epistemology* based on the

understanding that knowledge is relational and shared with all of creation (Wilson, 2008). Knowledge in this respect is not gained or owned by myself as the researcher, but is merely passed on, and that knowledge must then be shared with Garden River's community, and all those who will benefit from it. The relationship in the research project is one that consists of myself as the researcher and the key voices that hold truths and knowledge essential for producing the results of this project. A key relationship was developed between myself and Maxine Lesage, the Health Services Supervisor at Garden River, with whom I was in constant dialogue while designing this project; which was fostered through the connections my Co-Supervisor Dr. Sheldon Tobe had with the community. Through conversations between myself and Maxine, we began to build a working partnership as each party expressed their desires for the outcome of the research project. A level of trust needed to be built as I was to be invited into the community to collect these findings. This relationship was then translated to the voices that took part in the study as I was vouched for as being someone who was trustworthy. My relationship with the community will continue to grow as I will return to present the data and potentially aid with future research projects the community is interested in.

### 3.2.5 Axiology:

The axiology refers to the ways in which the research is morally and ethically sound (Wilson, 2001) and is the analysis of values to understand their meaning, origins, purpose and acceptance as true knowledge (Chilisa, 2012). An axiology based on relationships employs the four Rs: relational accountability, respectful representation, reciprocal appropriation and rights and regulations during the research process (Louis, 2007). According to Chilisa (2012), *relational accountability* refers to the ways that all parts of the research are interrelated, and that the researcher is accountable to all relations involved. *Respectful representation* refers to how the

researcher accommodates the voices of those he wishes to receive knowledge from and is evident in the way the researcher listens, pays attentions and creates space for the sharing of knowledge. *Reciprocal appropriation* acknowledges that all research is appropriation and must benefit both the researcher and the communities being researched. *Rights and regulations* refers to the ways that the interests of the researcher and communities are being protected, through ethical considerations and protocols.

### 3.2.6 Relational Accountability:

#### 3.2.6.1 Community Advisory Committee

In collaboration with my supervisory committee and Garden River First Nation, a community advisory committee was established that helped to inform the research project in its entirety and was made up of my Co-Supervisors Dr. Darrel Maniowabi and Dr. Sheldon Tobe, and committee member, Dr. Jeffrey Wood, as well as the Health Services Manager, Pamela Nolan, and the Health Services Supervisor, Maxine Lesage. This committee was formed to have the best interests of both the researcher (myself) and the participating organization and those affiliated with it. This committee ensured that the study adhered to the guidelines of research with Indigenous population and that respect and community engagement were maintained (Canada, 2014).

#### 3.2.6.2 Accommodations:

In order to foster a healthy working relationship, I stayed at the Health Supervisor's home for the duration of my research. I spent time talking with her family and learning about the community and their stories. We shared a meal together, where I was able to ask more questions pertaining to the research, which enabled me to gain a broader understanding of the inner workings of the community and some of the back story needed to understand the context of the diabetes program.

### 3.2.7 Respectful Representation:

#### 3.2.7.1 Sampling Approach

This study used a purposeful method to obtain participants (Creswell and Poth, 2017; Patton, 2015). The sample consisted of eight clinical staff who were instrumental in implementing and administering the diabetes prevention program. The staff were those who were involved to some respect in the program and who could speak to the efficacy of what transpired. Participants were recruited by Maxine Lesage and consisted of the Health Manager, Health Services Supervisor, nurse practitioner, dietician, community health promoter and three registered practical nurses. Conversations were conducted one-on-one in the conference room at the Health and Wellness Centre in Garden River First Nation to ensure respondents felt comfortable and at ease. These staff members were chosen on the basis that many of them had been around since the program in question's inception 11 years ago. The Health Supervisor felt that these individuals would be able to best explain how the program began and, in the process, provide the most comprehensive responses, as many of these individuals were front-line workers during the program.

#### 3.2.7.2 Honorarium

In keeping with Ojibwe customs of gift giving to show appreciation, a handwritten card along with a \$10.00 Tim Hortons gift card was given to each respondent. Respondents were not made aware of the details of this token of appreciation prior to the study.

### 3.2.8 Reciprocal Appropriation:

#### 3.2.8.1 Community-Based Participatory Action Research

In order to ensure both the researcher (myself) and Garden River First Nation benefited from the project, the guiding principles of Community Based Participatory Research were used (CB-PR). CB-PR (Bull, 2010; Esler, 2008; Fletcher 2003) is increasingly becoming an important tool when

conducting research with Indigenous communities; more specifically the Anishinabek communities of northern Ontario (Jacklin & Kinoshameg, 2008). Cochran et al. (2008) makes note of the ways Indigenous communities have been taken advantage of by researchers, who often misrepresent and do not have the community's best interest in mind. CB-PR is therefore a partnership that exists between the researcher (myself) and Garden River First Nation, who both desire to work together to achieve a common goal (Bull, 2010). Cultural beliefs and traditional knowledge were incorporated through all aspects of the project and will continue to allow members from the community to speak into it and remain partners (Baydala et al., 2013). According to Petruka et al. (2012), the basic principles of Community-Based Participatory Research are that the research:

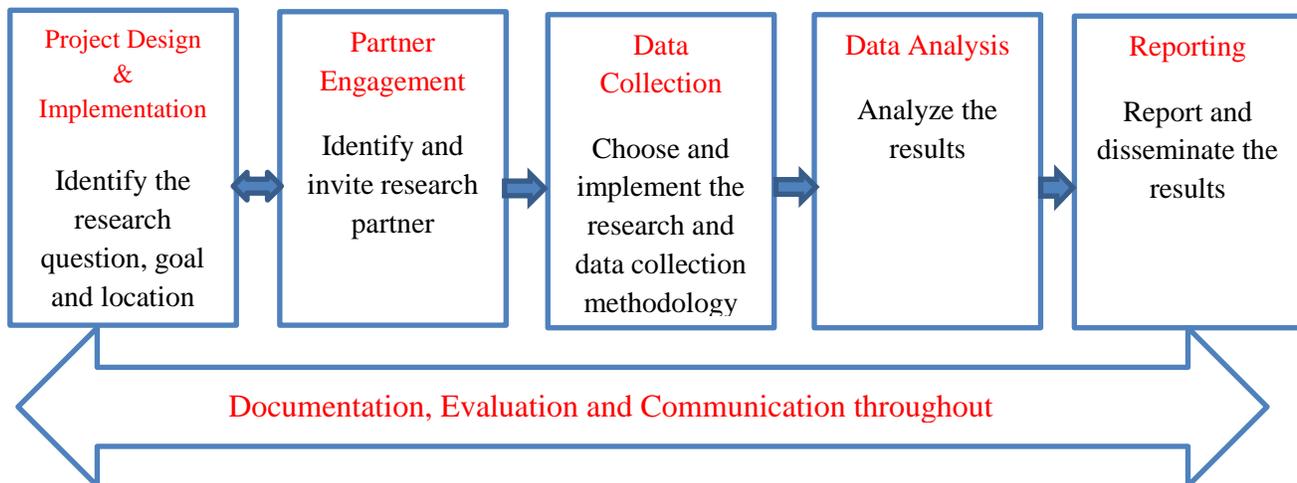
- a) Acknowledges historical negativity of research and overcome past research practices
- b) Recognizes the existence and importance of tribal governance models
- c) Differentiates between tribal and community membership
- d) Understands that diversity exists and that Indigenous peoples are not homogenous groups
- e) Invests time in building relationships and trust
- f) Collaborates with key individuals (community leaders)
- g) Prepares for changes in leadership throughout
- h) Includes the community to ensure cultural beliefs and traditional ways of knowing are embedded
- i) Employs Indigenous ways of knowing

Burns, Cooke and Schweidler (2011) outline ways that CB-PR can be expanded to include an *action* component, thus making it Community-Based Participatory Action Research. The addition of the word *action* denotes that the researcher and community have undertaken this research to effect community transformation and change. The *action* component acknowledges

that the research is applied in nature; that the community brings valuable, irreplaceable knowledge that produces grounded truths; that “expert” research and interventions from outside the community can have disappointing results; that communities have equal inclusion and collaboration through all aspects of the project; and, lastly, that there is value and legitimacy in the voices of those in the community (Ralph-Campbell et al., 2011). By having the community engagement in this research, CB-PAR:

- a) Facilitates collaborative, equitable partnerships in all phases of research
- b) Balances research and action for the benefit of all
- c) Builds on community strengths and resources
- d) Promotes joint learning, skill sharing and capacity-building among all partners
- e) Engages in long-term process and commitment
- f) Emphasizes and engages in addressing often complex causes of local problems
- g) Disseminates findings and knowledges gained to all partners and involves partners in next steps
- h) Involves systems development through cyclical and iterative processes

The action component of the research will manifest in the way the research will help the community to develop a process model that can be used to outline best practices for a diabetes prevention program for First Nations children. This tool will be available for the community to use as well as for other communities, as per the wishes of the community advisory committee. This research will potentially be used by the community to enact changes in their programs and make adjustments where they see fit.



**Figure 2** Process Model outlining CB-PAR. (Source: Burns et al., 2011)

### 3.2.8.2 Rights and Regulations:

#### 3.2.8.2.1 Consent Process

Individual free and informed consent was taken from participants before the conversational process began. Prior to conducting any conversations, participants received a letter of information and the consent form outlining the purpose, what will happen, expectations, potential benefits, incentives, acknowledgement, disclosure and ethical approvals (Appendix C and D). Participants had the right to refuse at any point in the data collection process.

Respondents were asked if they would allow themselves to be audiotaped and were also offered the option to have the conversation typed verbatim instead. Respondents were also given the option to sign or to give oral consent. All but one respondent gave written consent, as the conversation in question was conducted over the telephone.

#### 3.2.8.2.2 Ethical Considerations

An initial meeting over the telephone established a desire from the health and wellness team to participate in the research project and a letter of support was provided on behalf of the Chief and Council further confirming the participation of the community as a whole (Appendix B). Ethical

approval was also sought through the Laurentian University Research Ethics Board (LU REB) before any data collection was done. The process included an application outlining the research in its entirety and the plan for carrying out the research. Approval was received after initial revisions requested by the board and can be found in Appendix C. The approval process from the community as well as LU REB ensured that the research adhered to research protocols for working with Indigenous populations as outlined in the TCPS-2 module (Canada, 2014) as well as those outlined in the OCAP<sup>5</sup> principles regarding *ownership, control, access* and *possession* of data.

## 3.3 Methodology

### 3.3.1 Study Design:

This project was carried out as a qualitative case-study that utilized semi-structured interviews. In keeping with the Indigenous Research Paradigm, this methodology sought to include the ideas of the conversational method (Kovach, 2010). This type of data collection as outlined by Kovach (2010) is one that is built on relationships (Chilisa, 2012; Wilson, 2001; 2008). These ways of knowing are personal and derived from all relations, or creation (Kovach, 2010), and knowledge attained through research is not only the ideas of the individual, but everything surrounding the individual (Wilson, 2001). Being able to converse and build a working relationship with informants through conversations was instrumental in understanding and interpreting the knowledge that they share. In keeping with Indigenous worldviews that value orality, this method allowed for knowledge to be passed in a culturally appropriate way (Kovach, 2010) that

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<sup>5</sup> OCAP® is a registered trademark of the First Nations Information Governance Centre (FNIGC). Visit [www.FNIGC.ca/OCAP](http://www.FNIGC.ca/OCAP) for further details

encouraged the engagement and participation of those in the study by allowing them to express their responses in a manner that incorporated a wholistic model of being.

By allowing the individual to respond through the use of stories and anecdotes, a more wholistic approach was adopted that allowed for the individual and the researcher to engage in meaningful and unique ways. By viewing the individual as more than a participant, a relationship was established that allowed for a stronger collaborative process between the researcher and the voice being heard (Bishop, 1999). The goal of this approach was to allow key members to speak into the research question being asked, in order to inform the larger narrative (Creswell and Poth 2017), which, in this case is a template that other First Nations can use.

### 3.3.2 Data Collection:

The conversational guide was approved by the supervisory committee as well as the health supervisors at the community health centre. The question guide was designed to understand the necessary processes behind implementing and maintaining a successful obesity prevention program for First Nations children and youth. The questions followed principles outlined by Cross et al (2000) and Chilisa (2012) regarding the incorporation of concepts from the medicine wheel (context, body, mind, spirit).

Prior to conducting the conversations, respondents were reminded of their right to refuse participation. Respondents were also invited to take the conversation in whichever manner they saw fit. The conversation guide was used for each person in order to standardize the potential responses. Conversations were recorded using a Zoom H4N personal recording device and transcribed verbatim using ExpressScribe. Conversations lasted between thirty minutes and one hour and thirty minutes. Throughout the interview process, notes were taken outlining the type of

response and where it would fit in relation to the conversation guide questions. Interview transcripts for each respondent were then read over with the recording to ensure accuracy. Responses were then placed under final question headings from the conversation guide to ensure responses fell into the proper category for thematic analysis and coding.

In addition to the conversations, staff at Garden River First Nation provided me with sample assessment forms, advertisements, and other documentation that has been used throughout the running of this program. These documents are sample documents and are used in this study as a supplement to the data collected from the interview process. Thorough analysis of these supplementary documents goes beyond the scope of this thesis; however, a discussion of the documents will be included in the analysis of the themes.

### 3.3.3 Personal Reflection

Throughout the collection and analysis process, personal reflections were made by myself with regards to the interview process and results. It was important to do this in order to make myself aware of any biases I might be bringing into this research as well as any outside influences that might skew the results. These reflections were used to guide the analysis process but will not be included in the final document.

### 3.3.4 Analysis

Transcribed files were imported into QSR Nvivo 12 plus and organized by *speaker* and *question number* categories. An initial thematic coding sequence was carried out using the automatic thematic coding function in order to gain broad ideas of the contents of the data. The automatic thematic coding function in Nvivo is designed to identify common nouns, noun places, and ideas. I then relistened to the conversations while reading over interview notes and transcripts in

order to become familiar with key ideas, tone and context surrounding the conversational guide. Thematic analysis was then carried out by myself based on themes identified by *speaker* and *question number*. Key ideas were identified and aggregated into codes, which were then aggregated into the themes (Cresswell and Poth, 2017). Once themes were generated from both categories, an automated matrix query was done to triangulate overlapping themes and ideas that appeared in each sequence. These common themes were then aggregated into one set of themes that were most frequently presented throughout the data. Any insights noted in this study have been provided by the staff at Garden River First Nation, mainly through the use of the semi-structured conversations.

### 3.3.5 Validation

Final aggregated themes were validated by myself initially, as I went through the data to ensure that the ideas generated as final themes were in fact the most relevant ones. Themes generated were validated by the number of times the topic was mentioned by respondents in both the *speaker* and *questions* category, which was identified by running an automatic coding matrix. Final aggregate themes were compared to the initial automated thematic coding sequence to identify if any themes were missing or over represented. The Community Advisory Committee as well as the Health Supervisor were then informed of the key themes and consulted on the appropriateness of each. This is important to ensure that the results generated provide an accurate depiction of the ideas generated in the conversations. Furthermore, the identity of the respondents was kept anonymous to allow for honest and transparent feedback.

## Chapter 4: Results

### 4.1 Program Specifics

#### 4.1.1 Program Overview

The program in question has been running for 11 years and is most commonly known as the “Back to School Blitz”. This program stemmed from one of the initiatives being carried out across the North Shore Tribal Council communities which consisted of annual check-ups for children and youth to keep track of immunization records and updates, pediculosis checks, and health promotion awareness consisting of diabetes education for the communities. Due to the rising identification of diabetes risk factors among First Nations children and youth, Garden River decided to take that idea and began to mold it into their own by focusing the screening on targeting children and youth during the summer months (end of June into September) in an effort to catch the major risk factors for obesity and diabetes diagnosis as early as possible. Once it was decided that the program would be ongoing, efforts were made each year to raise awareness of the program by advertising through the use of posters, community newsletters and word of mouth, see Appendix G for sample flyers. Letters were also sent to parents and caregivers informing them of the nature of the program see Appendix H. Presently, the program consists of three main components, questionnaires regarding lifestyle and nutritional habits, to be filled out by parents/caregivers as well as children and youth, a physical assessment for children and youth including measurements for height and weight, Body Mass Index (BMI) and a capillary blood sample (finger poke); and, lastly, a follow-up component with referrals to appropriate health care providers (doctor, nurse practitioner, dietician, traditional healing services, community health educator, physiotherapist, counsellor.). Once the program begins each year, children and youth are then able to make appointments to come to the clinic to participate. Incentives have been

used since the inception of the program as a means to bring in as many participants as possible and are given out per child or youth.

#### 4.1.2 Screening Tools

Over the years various screening tools have been adapted and refined, but consistently throughout the running of this program, Body Mass Index (BMI), height and weight and blood glucose taken via a glucometer have been recorded. The main screening tool has been a collaboration over the years with input from staff and validation through consistent research using the Registered Nurses of Ontario Association's (RNAO) handbook to provide recommendations. Literature reviews as well as consultations with health professionals in the field have shaped the screening tool to the present day. Presently, this screening tool is filled out by one of the Registered Practical Nurses (RPNs) when a child comes for screening. The main tool (Appendix I) consists of a *risk factors* section which is used to demarcate if a child has a BMI over the 95<sup>th</sup> percentile, has a family history of diabetes (specifically maternal), and/or if they present with Acanthosis Nigricans (darkening/hyper-pigmented skin thickening around neck, groin, armpit). A *lifestyle and nutritional patterns* section is then filled out, identifying on a scale from 1 to 5 the number of sugary beverages, servings of milk/milk products, vegetables, and fruit per day. Lastly a *sugar test* is offered to all participants as either a fasting blood sugar or resting blood sugar reading, with the most common being a resting blood sugar reading. Levels are recorded as well as the last meal/snack consumed. There is an option for the nurse to refer the participant to a number of services should there be cause for concern regarding any portion of the screen, for example a BMI over the 95<sup>th</sup> percentile, or responses that indicate a risky lifestyle. Testing positive for a combination of *risk factors* as well as a *fasting sugar test* reading over 9.0mmol/L would warrant an automatic referral to the nurse practitioner or

physician. If a child presented with a *resting sugar* reading that was high, but did not possess the other risk factors, that child was given another reading on a separate day. Other health care professionals that the child might be referred to include: registered dietician, physiotherapist, psychologist, traditional services, chronic disease nurse and, most recently, a mental health worker. Over the years questionnaires were added in, assessing eating and lifestyle habits using a parental/caregiver assessment questionnaire (Appendix L). Physical activity questionnaires from the Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) were also added in order to evaluate the children's perspectives on their physical activity levels over the past seven days (Appendix J; K).

#### 4.1.3 Incentives:

Since the beginning of the program, incentives have been offered to the children and youth participating in the study. Originally, the incentives included backpacks full of school supplies, but over the year have evolved to a \$40.00 Walmart gift card that is given to parents on behalf of children who are not in high school and given to high school students directly. These incentives are given per child and are designed to help families purchase any goods they feel are most necessary for them.

#### 4.1.4 Follow Up Programming:

Data collected from the screening process is inputted into the Electronic Medical Records system (Mustimhw, previously Nightingale On Demand). As previously mentioned, children and youth who present with risk factors warranting intervention may be referred to programming that would seek to educate the child or youth and their families on proper nutrition, physical activity ideas, traditional and cultural experiences or some combination of the three. This section

contains examples of programming that is available to children and youth through the services provided by the North Shore Tribal Council. Some of these programs have yet to be carried out in Garden River First Nation, however, the opportunities are available. These programs were mentioned during the interview process; however, there are a number of other programs made available for children and youth that address the wholistic view on healthy living, that are not mentioned. More programs can be found in community calendars updated monthly. The programming offered in the community calendars are run by a variety of staff from Garden River and the North Shore Tribal Council.

**Table 2** A summary of programs being offered by the staff from the North Shore Tribal council. Programs were identified and discussed in the interview process

<b>Personnel</b>	<b>Follow Up Programming</b>	<b>Description</b>
Dietician, Community Health Promoter	Eat the Rainbow	Education component on the types of foods that are healthy based on the colours of the rainbow. (Done in schools mainly, not formally at Garden River)
Dietician, Community Health Promoter	Make and Take	Cooking class for children and youth that teaches how to make complete meals in mason jars for easy transportation (overnight oatmeal, tuna salads).
Dietician, Community Health Promoter, Diabetes Nurse Educator or Nurse Practitioner	Family Kitchen	One-on-one session with a family to receive education on meal planning and balance, food groups, portion size. Cooking a healthy meal to try new items. Blood glucose reading offered. Jeopardy game to test and reiterate knowledge gained.
Community Health Promoter	Community Garden	Program to replace Family Kitchen. Involves the community coming together to plant gardens to cultivate healthy crops. Traditional medicines are also planted and cultivated
Community Health Promoter	Aanjichigewan Healthy Lifestyles	Culturally based program to teach the importance of Indigenous food and activities for mothers (hunting, trapping, skinning). Also includes diabetes education and behaviour change, with the intent that this knowledge is passed on to children in the family
Community Health Promoter	Family Fit	Practical skills for parents and children with a set curriculum: health lifestyles, parenting, nutrition, and physical activity. Parents and children are each given their own workbooks and curriculum
Community Health Promoter	Annual Rez Walk with Diabetes conference	A 3km walk/run that unites all communities that are part of the North Shore Tribal Council. A diabetes conference will be held after the walk
Community Health Promoter	Movers and Shakers	Youth from each Tribal Council community are invited to participate in a retreat that is land and culture-based and designed by a youth council

## 4.2 Themes

Once codes were identified and responses within those themes aggregated and sorted, it was found that the main themes of the study were: *program details, incentives, culture and tradition, barriers and limitations, and facilitators*. An outliers theme of *humour* was added in with *culture and tradition* in order to highlight one response that stood out to me and warranted being pursued. These themes represent the main ideas that were generated throughout the interview process and manifested when transcripts were analyzed by individual speaker as well as by questions from the conversational guide, and were triangulated using a matrix coding sequence and automated thematic analyzer from Nvivo 12 Plus.

Below is a word cloud that was generated by Nvivo 12 Plus from the most commonly used words and ideas in the final aggregation of themes, and subsequently edited for words and word phrases that yielded no pertinent meaning. The word cloud acts as a visual representation of the most commonly used words and ideas, and sizes the words based on frequency. This can be a useful visualization to see how key ideas fit in conjunction with each other, and what was cited most frequently by respondents.



mobilizing the team to want to design a program that would enable them to track and raise awareness of the risk of diabetes in their population. Furthermore, it was believed that targeting children and youth was a move in the right direction, as effective screening and prevention practices taught early on would help to mitigate risks in the future.

*What caught my attention was the information that we got from the Canadian diabetes association, which talked about the risks or who would be at risk for diabetes. And just by the mere fact that if you were a First Nations person you were on, they're at risk list and that would be one of the risk factors right. So coming from a First Nation community... so we're all at risk right? It doesn't take a genius to figure that out. So we're all at risk. So then what do you do? Because you only need to have one of those risk factors according to the CDA to be at risk. So maybe we should start looking at now doing some early screening because we know, we do know that we have programs and services and they're are both on reserve and off reserve services for people who already have diabetes. And programs are fairly good. And we had a diabetes program here. But then what about people who, who don't have, or don't know that they have diabetes, so we should be concerned about those. And then what about the kids, what about starting to teach them through an early screening program that they have to be mindful of being at risk to have diabetes, just by the mere fact that they're a First Nations person right. So we thought, if we can do the early screening and talk early about diabetes then I think, kind of the awareness factor builds as they grow in. They come every year, they get screened for diabetes. So we thought that that that's where, that's why we put the program in place. (180502-201)*

The design of the program is one that is carefully thought out and organized. Over 11 years the goal of the program has always been to improve the design and maximize efficiency. One of the main driving forces for designing the assessment tools was the notion the tool needed to be evidence based and adhere to the Canadian Diabetes Association (CDA) (2016) guidelines and Registered Nurses Association of Ontario (RNAO) best practices.

*And then before we even got to the actual doing part of the project the background on the research piece, so that it aligned with everything I was saying before, our best practices, the current provincial standards for the diabetes guidelines, Canadian diabetes guidelines, any literature that's out there in terms of childhood obesity. Sort of looking at those clinical guidelines was a big part of it....Just because it had been designed originally as a general diabetes screening tool for our First Nation*

*community and the other communities along the north shore. So a big part of that too was looking at that tool and refining it. So we really kind of dove into that. And then once we discussed that, I would go back and look at the guidelines that were through the Canadian Diabetes Association with what they stated for children and youth for screening factors for blood glucose. So we wanted to address prevention and awareness for our youth, and I think that the time, there were provincial initiatives for addressing childhood obesity in children, like all the media was coming out talking about the children, you know? (180502-102)*

One particular strong point with regards to identifying and revising the assessment tools was the fact that Garden River First Nation had constant collaboration and consultation with professionals in the field. By dialoguing with individuals who had expertise in different areas, the program was able to be overseen and developed in a manner that would account for maximum efficiency.

*Okay. So I'm [Name] and so I was involved from the beginning with the development of the tool that we used for the back to school program. So I was consulted as the nutrition expert further for my input on that. So we have meetings that I participated in. And then when we revised the tool, if there is any input to be added to that, I was part of that. In the resources that were handed, the packages that were given to the kids and their families. I was involved with that so, whatever was requested, or the nutrition handouts to be included. Most part of that. (180502-200)*

Various individuals would engage in research and ensure the information being used was accurate.

*We did a lot of research in terms of norms and what levels were and what the risk factors were. That kind of stuff to put it together then to get the forms completed by the staff of the parents, so that they were accurate to develop when we reviewed them to make sure they were right and that kind of stuff. So I made sure that it was accurate to make sure that all the levels were read, that you know that we were using the most relevant data. And then compile the original form. Just did research and literature searches to figure out what, where we needed to be with the risk factors, well we know the risk factors, but you gotta have every search behind you, right? (180502-300)*

The staff at Garden River are committed to continually improving the program and coming up with evidence-based ways to better screen their children and youth. One of the ways they did this was by adding a physical activity questionnaire to be filled out by the participants themselves as a way to gauge their perspectives on how active they are (Appendix J).

*So every year when we, we kind of what I would, revisit the program again, I would look at, okay, how many people all came in this year's the girls would give me a report on are we getting more numbers, or less numbers. Did we meet our target from last year or are we so how do we do that? How do we address any shortcomings of the program? So we will talk about that. We talked about what some of them. The other thing that we emphasized as well besides the nutrition part was the activity level and part of one of the questions in there too like one of the risk factors, but going back to some of the tools that were used. (180502-102)*

#### 4.2.1.2 Execution

The program begins with advertising done throughout the community using flyers, advertisements and word of mouth. During the month of June, staff are busy preparing for the program, that lasts from July to August, and as of recent years, has been extended into September in an effort to accommodate more participants. Participants book appointments prior to getting screened. Prior to the formal screening period, children and youth who are capable of understanding and filling out forms on their own are given assessments to gauge their physical activity. Parents of children are given assessment forms that are used to gauge the home life of the child (nutrition, family eating practices). The formal screening process involves the RPN filling out the *Community Blood Glucose Screening for Children Living Well Assessments* (Appendix I). In this form, anthropomorphic data is recorded in addition to risk factors (Acanthosis Nigricans) and high blood glucose (obtained through an optional finger prick glucose reading). The child is also asked to comment on their dietary and physical activity levels. If any responses stand out to the nurse, that child is either immediately referred to their physician or a nurse practitioner. "Because they would tell me right away if there was a someone's on high

alert didn't like in this this child was right away. We noticed soon as they came in, they presented with Acanthosis Nigricans” (180502-102).

*I would schedule in the children and families. They would come in. I would. I do the assessment, the form I gave you to go through [Assessment form]. So do their height and weights and get their BMIs...Checked their sugar levels while there have been in there, their lifestyle, nutritional habits. The parents would, I would also give them two checklists, their physical activity, their nutrition at home. They fill out those questionnaires and give them to me, they're all compiled into a big list just a big list of more or less for the diabetic educator or dietitian over. Get some alerts whether its high alert. (180503-402)*

Some years, students were brought in (medical or nursing) and they would help compile the data that was collected over the program duration. They would then input the data into the EMR system and alert the Health Services Supervisor if there were any major concerns they came across, that may or may not have been reported during the program itself:

*I delegated the students to file all the information so that if I wanted to go and retrieve it was in some sort of some type of order other than it being like scanned into the EMR system. So would have like the assessment tools would be filed, any of the surveys like the questionnaires for the for the activities would be filed the parent questionnaires, like they were all filed accordingly and in a binder where they could easily access it. (180502-102)*

Children and youth who were not immediately referred to their physician or nurse practitioner but still presented with health concerns were referred to programming typically run by staff from the North Shore Tribal Council, with the dietician being the main person who would receive the referrals. Once the referrals were received, programs (see Table 2) were run throughout the year, depending on availability of staff and resources. Collaborations between the staff at the North Shore Tribal council was necessary to ensure multiple components were being addressed in the programs. Staff from Garden River typically did not participate in the referral programs.

*The other involvement was the kids that were referred for one on one appointments to see the dietitian. And then groups. So we had group with the youth for various programs. We might have done Eat the Rainbow program, Make and Take cooking, easy cooking classes for the kids and the youth. (180502-200)*

#### 4.2.1.3 Food and Nutrition

Food and nutrition was identified as being significant by four respondents. In this context, food and nutrition will be explored as components of the program itself. It is worth noting that throughout the other themes, food and nutrition is also discussed; however, the context is different. The main contexts that it was referred to was with regards to the rationale for why this program exists and the importance of having a follow-up piece that addresses what these children eat on a daily basis. Food and nutrition showed to be prominent in the way that programming was designed and implemented, not only in the assessment phase, but in the follow-up phase as well. When I was being informed on the nature of the program and the direction it was going to take, one respondent said:

*So I've seen that and I said, hey, now there's something that we should [take] like another angle to the program, again that we should be looking at because you know, kids are coming and getting the measurements, but a big influence on them is the parents and what they are feeding them and their the nutritional habits and their views on what they think is healthy or not healthy. So then I got the team to start implementing that questionnaire, and I am not sure, if it was consistent all the way through. But there was a couple of years if they did do that as well. And those were taken right from the RNAO best practice guidelines because they recommended that parents and caregivers should have a direct role in the child's eating and nutrition. (180502-102)*

By acknowledging that taking anthropomorphic data without the proper context behind it was doing a disservice, Garden River First Nation began to take steps to identify the type of foods that their children were eating. By doing this, they were able to formulate questionnaires that gave greater insight into the areas that most needed to be addressed through this program. These

questionnaires were able to gauge where the families were in terms of nutritional food patterns in the home.

*Yes. That's when we used last year. Checked their sugar levels while they have been in there, their lifestyle, nutritional habits. The parents would, I would also give them two checklists, their physical activity, their nutrition at home. (180503-402)*

When it came to program direction for staff, it was evident that food and nutrition

were of utmost importance:

*Basically, when you're when you're looking at what we're doing, it all boils down to the healthy eating, more fruits and vegetables. More whole grains. Less refined, deep fried fatty foods, right, more physical activity like our message is always the same. We focused on fruits and vegetables. Fruits, vegetables and the dairy group, those two food groups because we always referred to the Canada food guide, mainly the vegetables and fruits because from the surveys and the questionnaires, those were the lowest groups, and those are the kids that were usually referred, were if they were low in fruits and vegetables. Low in any of the food groups, high in sugary drinks, pops, fast foods, deep fried foods, if their BMIs were high. (180502-200)*

The second context that food and nutrition was addressed in was through the use of follow-up programming that children and youth along with their families, can attend (See Table 2). A key piece of the program was addressing the nutritional shortcomings of the participants' home life through programming that taught healthy eating can be fun and exciting. These programs focused on the whole family and showed how to have creativity when overcoming obstacles that families would face such as lack of cooking facilities, time, knowledge of healthy foods and ways to prepare them. Programming consistently provided educational components, practical skills and new experiences for those families that were interested in attending these classes. One particular program that stood out was the Family Kitchen.

*The other program we have is weight map, which is now the Aanjichigewin healthy lifestyle program which also has curriculum. And this program is for mothers and the hope that they take what they learned back to their families. So there four core*

*sessions, they have to take. So it's the Aangichigewin introduction, motivation and behaviour change made to move, and nutrition, and then they get a choice between eight other topics. (180503-500)*

*And we also did Family Kitchen. And Family Kitchen is where we worked one on one with one family, and they've get one on one time with the diabetes nurse educator, with the dietitian, and also with the health promoter. It always starts with some education based on many planning, meal balance and food groups, portion sizes and basic food safety. We eat. The menu is based on what the family normally eats and the dietician puts a healthy spin on it. And they also get to try new things. They also get the pokie-poke so they get their blood glucose levels tested. And we play jeopardy. (180503-500)*

It was through this particular program that one respondent shared:

*We had one of the kids just quit McDonald's because of the education provided by the nurse educator. He put it into terms that make him understand. How far you have to walk to walk off your Big Mac meal? And he gave a distance between here wherever the kid was, it really impacted him because he never ate McDonald's anymore. (180503-500)*

Success stories such as this show the effectiveness of the programs. By incorporating educational components in a manner that young people can connect with, this program was effectively able to set this child on a path of healthy living.

#### 4.2.2 Theme Two: Incentives

One of the most prominent themes that presented itself through the research was the use of incentives to encourage attendance and was mentioned by all eight respondents. The incentives were a mainstay of the program, with the initial package offered to children being backpacks full of supplies. Over the years the incentive evolved to include a \$40.00 gift card to Walmart. These packages were done to support families with purchasing necessities.

*So we also give incentives for the kids to come in so that you know, also support mom and dad to help him out with school supplies. I think the first year we did like backpacks and rulers and all that kind of stuff. But then we said, you know what let the parents decide what they need. They need something and also didn't give like a*

*Walmart gift card. And that way they can buy. They wanted to buy nutritional snacks. It was there. If they wanted to buy clothing, it was there. They want to buy school supplies. It's there it's like a big store right, and you can get all sorts of stuff. So we would give them incentive packages, or incentive cards. (180502-102)*

Staff had overwhelmingly positive feedback for the use of incentives, often mentioning that participants attended the program because the incentive was being offered and advertised each year.

*Yeah, just to have creative interesting ways to pull people into a program. So they think it's something new, but really it's the same message right? So you want to I guess that's the challenge is to make it sound fun to get people involved. Often people will come to stuff when there's, giveaways, free food and giveaways the back to school program like they were getting backpacks and gift cards. That gets them in the door in the first place. (180502-200)*

*They also have packages like the get incentives to come, so I don't even know what they are or what this year is one year it was a backpack with school supplies. And stuff like that, you have to have incentives to get people to show up. And that's been really successful around here. So. You know, so I think those are the things that probably the incentives and the fact that the program is an ongoing every year. People are used to it. So it wasn't a fly by night with other, do this and not do it anymore. (180502-300)*

It was interesting to note that the incentives became a part of the program that families came to expect and, because of that, attendance to the program increased each year. Originally Garden River offered the program only to band members, but due to the nature of family dynamics, it was offered to whole community.

*Oh, great. I think our numbers grew and grew and grew every time we did it, every year we ran it. And I think the first year, or the first two years we did it just for Garden River Band Members, but Garden River as a whole has changed a lot. And there's a lot of blended families, and there's a lot of families that have step children now that live here or stuff like that. So we ended up eventually opening it to just the community children because it's important for community as a whole to be healthier, so we didn't mind opening it up in it. It definitely increased our numbers as well. (180503-401)*

Some respondents noted that the idea of the incentive, while instrumental in drawing the most number of children, possibly became too much of the focal point for why families were coming. Some respondents felt that parents were bringing their children in order to receive the incentive, when in actuality, the incentive should be the health and well-being of their child(ren). This showed an interesting contrast to the main view that was held about the incentives. These respondents noted that the incentive is doing the job by bringing children and youth in to the program; however, something should be done to facilitate their attendance with the primary focus to ensure there are no health concerns.

*Without incentive, it's hard to get people to come out and participate, which is kind of unfortunate. You know, you hope that parents are concerned enough about their children in preventative health. But not everybody is with that gift card being there. That definitely brings people out. So. I don't know. I just feel like. That is something I don't know how to word. (180503-401)*

*I guess the incentives, I think otherwise, I don't think that they would go. And I have a love hate with the incentive. The incentive is your health. Not the door prize, not a gift, not money, not nothing. (180503-500)*

Another concern with the incentives was that for participants in high-school the incentive is given directly to them, as opposed to the parents, as is the case with the younger children. One respondent felt that the interest is not as high with the high-school participants as it is with the parents to participate in the program and warrants further research for ways to effectively reach this population.

*The incentives really helped to help the parents bring the students in. Yeah, it's not really, the incentive doesn't really go to the students, for high school it goes to the students. The buy in for that program isn't as good as the getting parents in, you know, they're the ones that control the budgets in the home, and this really helps them to do some back to school shopping and getting their kids ready for school. So they will come in and do the bring their kids to do the screen. We just have to take a look at that, because we give the incentives for high school, directly to the high school kids. And that is a bit of a slower uptake. And we have to figure out how we can do a better job of that. (180502-201)*

## 4.2.3 Theme 3: Culture and Tradition

### 4.2.3.1 Family and Community Relationships

Garden River understands that children who have a relative with diabetes are at a risk for being diagnosed with diabetes as well, which is especially true for those children whose mothers were diagnosed with diabetes. This informed the screening process, as that is a key question that nurses will ask.

*And then for the most part, but what we were seeing was that a good percentage of the children were seen as being more overweight than anything. So not really showing diabetes or even pre-diabetes signs. But certainly, having identifying associated factors genetically right, because they'd have either first degree relative or maternally, the mother delivered the high weight, post delivery, those kinds of things. (180502-102)*

The same respondent talked about the home life in terms of intergenerational trauma, which provided an explanation for poor health outcomes in children; as they may grow up in homes with parents who have unresolved issues, who never learned to practice healthy behaviours when it comes to nutrition or physical activity, or who did not want their child to be deprived of pleasures the way they were when they were children. Parents may overcompensate in the ways they reward their child or fail to encourage healthy behaviours.

*Probably because they are dealing with other things that might be dealing yet. They might be dealing with other unresolved issues. And a lot of that ties back to look when we talked earlier about culture like I was just talking about the resources that we give out and how we want to talk about making sure that it's incorporated into what we do. But when we really peel back the layers and we talk about the culture in, you know about all the different, the latest, I guess, things that are happening, out there in terms of the TRC [Truth and Reconciliation Commission], the recommendations for the residential schools. It all relates back to cultural genocide of the colonization. And like it's, it's repeated so many times and you hear it. But when you really start to peel back and link it up to what's happening, you see it in this in the, the generations you see it in this young generation that's coming up where you know, they have more opportunity...all those issues that have been that have happened from the generations before with this with the residential schools, those issues haven't been resolved because that the family that they've just come from or their grandparents, or maybe the generation before that, they still haven't worked through those issues. So sometimes what happens is you see different, different parenting skills are coming through the way they should. So maybe the child's not disciplined properly. They don't think that it's not okay if they eat bad food or other eating. You know, you're having sugary drinks or part of that might just be because they're trying to give them, say maybe, like what they didn't have. Like oh I didn't have access to that? But that's good. You know, it's okay. It's not bad. You can have that. So they have a different way of thinking like. That now they kind of know it's bad, but it's okay. You know, you can have that. And so if the parenting skills are not there, that's going to come out as a negative outcome let's say nutritional patterns right or activity. Well, they never have, we never had computers and all these things when we were young, so I'm going to make sure that my kid has it. So I'm going to buy him the videos going to buy him, the tablets, I'll make sure he has a phone. (180502-102)*

Another issue that was mentioned was that parents themselves feel self-conscious about how they are raising their child. Respondents mentioned that parents did not feel comfortable filling out the assessment forms as well having their child's measurements taken because that could mean they would be told that their child needed to attend a follow-up program. Parents may perceive that they are doing a good job, either because they lack proper education on what nutritional eating should look like, or that was the way they were raised. This respondent also felt that parents are being hypocritical by telling their child that they are not allowed to have certain foods, but the reason that item is in the house in the first place is that the parent is buying it. Change must stem from the parents and caregivers and then be passed on to children.

*Yeah, but the parents need education. Quite a bit of education, so because really the parents are the ones buying the groceries and that. So yeah, I think it's them feeling threatened, not wanting to change. Because sometimes kids will come in and parents will come in with the kids are coming in because they're overweight, and the parents will say to the kids see listen to her now, you know, you can't have pop. Meanwhile the parents are buying pop. So the parents are pointing the finger at the the kids. So that's a really tough one. So if the parent didn't buy the pop in the first place. So they're not. They are not helping the child to be healthy. (180502-200)*

Another respondent also mentioned intergenerational relationships, but the potential for it to be used in a positive lens. While it is important to acknowledge the negative effects of intergenerational trauma from various sources and the ways that can negatively impact a child's health behaviours, we must not neglect the potential for intergenerational positivity passed on by older generations to the younger ones. An example of this could be that grandparents attend follow-up programs with their grandchildren and show them that they are making the right choice:

*Support of the elders is probably important too. You know, grandma, grandpa if they go, then you would go. So you know sometimes, they just maybe don't know, maybe their whole generation has never learned how to eat. Maybe their parents didn't learn how to eat, you know? So that kind of information can, even little bits of it can be helpful if you take a kid from drinking tang to a glass of orange juice. You know that's a that's a big change. Tang is cheap. Pure orange juice is not. (180503-300)*

A central idea that was mentioned by respondents was that the program seeks to tackle obesity and diabetes prevention through the use of familial relationships as well as those found in the community itself, "The community as a whole I mean, it takes a village to raise kids, and that's what they say (180503-401)." These programs are geared towards targeting the whole community, as diabetes was identified as an issue that permeates through the community and has been affecting a large number of the population for a long time:

*So probably for the community itself, In terms of generally speaking, aside from this target group of our children, diabetes has always been an underlying issue for us and you know we're always tackling it trying to come up with different strategies to address it other than the clinical piece. (180502-102)*

A problematic issue in the community according to one respondent is that obesity and diabetes is a “normalized” or “unavoidable” disease. This is known as “fatalism” and is a complex psychological cycle consisting of an attitude of inevitability, despair and powerlessness associated with poor glycemic control (Walker et al., 2012). This may be an issue children are struggling with, as they witness their parents, grandparents, and community members struggle with obesity and diabetes:

*But what I also feel like is a normalization of obesity in our communities which I don't know how to...Like oh my aunty, my sister, my cousin, you know all my parents are overweight, so it's okay for me to be overweight. You know what I mean? We need to not normalize obesity. Cause it's not normal. It was never normal in our communities. So we need to get away from that. I feel like this kind of like a defeatist attitude. Diabetes is in my family, I saw I'm going to get it. (180503-500)*

One respondent mentioned that childhood obesity and the risks for diabetes is not an issue that can be dealt with in isolation, but one that other families seek to address as well together. Naturally, as a child grows up in the home, certain measures must be taken within that environment to ensure that the child receives proper nutrition, physical activity, and health behaviours that will deter the onset of obesity and diabetes. An example of health promotion can be seen in the annual moccasin walk:

*So usually we have an ongoing program. I use the moccasin trail/moccasin walk as one because that would be an ongoing program that our community health educator would put on. So that's open to all family. So we try to tackle it from a family perspective enough and not say, well, we're going to send a child here that's going to rid them of diabetes, or it's going to prevent them because it really is a family issue right because of the history and genetically speaking. (180502-102)*

#### 4.2.3.2 The Importance of Culture and Tradition in Lifestyle

Respondents mentioned that *culture* and *tradition* were important aspects that needed to be considered when looking at the lifestyles of children and their families. One aspect that was mentioned is the relational aspect that is of high importance in First Nation culture. When administering a program that looks at anthropomorphic data and health behaviours, it is essential that the environment that these children enter into is one that promotes relationality between healthcare provider and participant:

*Whereas some families might just seem fine and they mean didn't need it or didn't really talk about it. So we just have always emphasized that when they are coming in, you know. And it's not just saying that we have to do something like we have to give them a physical paper that says, you know something about the culture or referring traditional services. But think part of that is more the environment, the environment that they're in the coming to the wellness center because it's being done here on the First Nation. There's a relationship, you know, like they'd know who we are, and we have a very welcoming environment, we support the kids. You know, we just we just have a different way of dealing with them so that it's not just clinical in they're in and out. We know the families we're talking to. (180502-102)*

Another aspect to consider is the cultural and traditional aspect surrounding lifestyle that is practiced in many First Nations cultures. One respondent stated that the programming provided to children and youth are the only exposures they will get to participating in activities that teach them about the traditions and cultures that were practiced by their ancestors.

*But there's a huge movement right now towards decolonization. When residential schools denied the culture to a lot of our community members. So often times programming is the only exposure they get to the culture. Now, we've even had that written on our evaluation form. Then we bring in Great Lakes Culture Camp...So they have programs where they skin a deer, share about trapping and hunting, traditional food and cooking, games. And even in like our program name, it's in the language. Our organizations name uses the language, we try to use the language. (180503-500)*

#### 4.2.3.3 Resources

Staff overwhelmingly felt that the resources offered through the program should have cultural and traditional components. These are some of the ways that children and youth can become familiar with their roots:

*But we always talked about the importance of culture. So I think at the beginning we might have been might have given out like different resources in our packages that would, would address whether it be specific coloring books or just something about the culture. (180502-102)*

Throughout the follow-up stages, several of the staff felt that children and youth should be exposed to the culture or traditions, whether this be in the form of the First Nations food guide, or through teaching about the health of the body using the concepts of the medicine wheel.

Throughout the various programs, the First Nations food guide is incorporated:

*Yeah, it's important. We use the First Nations food guide and. Well, sometimes we'll talk, in terms of medicine wheel, with components of the medicine wheel. Oh, sometimes will use like [Name] will tell them the Ojibwe words for some of the... So we have a program called Eat the Rainbow. Which is all the different colours of the fruits and vegetables. So she'll sometimes list up either on the on the chalk board or whatever. You know, this is the Ojibwe word for red or orange, whatever colour food were working on. (180502-200)*

One respondent suggested that incorporating Elders as key resources in the various programming would be beneficial for the children as they may be more inclined to participate out of respect for those in the community who are held in high esteem.

*I think it's important. Cultural teachings should be part of everything that's done. So I'm not sure how it's incorporated in there, but part of medicine wheel is physical health well. I mean, if you get your Elders involved, then you get that kind of stuff involved in the kids may be more prone to, to listen as well. Or do. You can listen all you want, but you have to do. (180502-400)*

One particular program that is being implemented seeks to not only incorporate the First Nations food guide, but creates a space where Elders are invited to teach the children about traditional

ways of life that promotes living and eating from resources that are obtained from the Earth in a natural way.

*How? Well our family kitchen we have the First Nations, Inuit and Metis food guide. I bring in, we have Movers and Shakers, we have Elders on site the whole time. That's all land-based culture based. We have a program, a brand-new program that's an Indigenous food and activity program. So it's all cultural activities, food, land based. (180503-500)*

Respondents also mentioned that books were handed out to the children and youth that addressed eating and living from a traditional perspective. In addition to this, the Back to School Blitz offers referrals to traditional services.

*A couple of years we would hand them out with the children. We also had other books... oh I could have showed you. That were handed out with the children. There is a referral on here for traditional services. (180503-402)*

#### 4.2.3.4 Services and Events

One respondent mentioned in accordance with the traditional services, that there is a traditional healer who is available for clients to see. She felt it is important for people to be living according to the medicine wheel teachings, maintaining balance. The idea of not having a spirit name or clan could lead to the individual feeling lost or disconnected from their community and for some clients, a disconnect from their cultural roots could manifest in behaviours that may not be beneficial for their health and well-being and may lead to chronic disease.

*On this we have we added the traditional services, so. We also came with, not only do we have the cultural worker here who clients could see, but we also have a traditional healer down at the healing lodge. So when clients, not all clients have their spirit name. Not all clients have their clans. And when clients have a sense of identity and that feeling of connection with something. They tend to be a more well-balanced individual, so. I think that offering that to clients, and a lot of people were very receptive to that. Refer to traditional services, so that could mean anything from seeing the medicine man, to getting their spirit name, or it could be learning about smudging, you know, medicines. So I think that's just as important. Like when you see the four colors [points*

*to medicine wheel on assessment tool] how they're even, I think that fits in there just as much as all the other aspects of health. (180503-401)*

Another respondent felt that having the option for families to visit a traditional healer was important, and that linking diabetes to life that is straying from that path may be beneficial for some families to hear in order to make any necessary changes.

*We also would put on, like for the traditional healer we would we would talk to some of the parents about, you know what it what do you think about the traditional health services? You know we have a traditional healer that you can have access to. If you feel you want your child to go on yourself in order to take advantage of some of those programs and some families were, were okay, they said no we're good and others were like ya I'm really interested, so we always tried to incorporate that and maybe speak to diabetes like it just depends for some parents would be they just kinda in and out and other parents would have more of a conversation. So they would want to have a little bit more discussion on the cultural piece. (180502-102)*

The same respondent felt that cultural events could also prove to be beneficial for the children and youth.

*Just tapping into what's out there like, say if we know a Powwow was happening. You know, are you going to the Powwow. That's really good. That's therapeutic. And if they are involved, if they're dancing in the Powwow like that would be another kind of, I guess, conversation. (180502-102)*

#### 4.2.3.5 Wholistic Living

Staff felt strongly that a wholistic outlook on life must be incorporated in the program's entirety, from the screening tools to the referral services. The idea that obesity and diabetes are not merely physical manifestations, but connected to the mind, emotions and spirit is a key tenet behind how the program is informed. Understanding the circumstances that surround the child at home and at school are essential to dealing with obesity and diabetes diagnosis.

*They seemed to be eating okay, we're not really sure, their blood sugars are coming back normal. And so what we learned from that too was to also not so much focus on the measurements that are presented clinically but also looked at the whole picture wholistically like what is going on with that child or that youth. What's happening in terms of their activity levels or nutrition levels. Their supports that they have family supports the structure of school, like all of those identified factors. (180502-102)*

Being able to understand the situations that are surrounding the child that are influencing health behaviours is an important factor to consider when developing and executing programs.

Knowing the various struggles in the community is a must when deciding what to implement.

One respondent mentioned that the use of incentives is a powerful way to draw people in. It serves as a tool for parents who may be struggling financially, who otherwise may be dealing with issues that do not facilitate healthy eating and living behaviours. The idea that the incentives are there to help address issues that may or may not impact diabetes directly is a strong example of how a wholistic outlook on life is essential to improving health outcomes:

*So we roll it all into well-being, we don't just say, here's our diabetes program. That's all we're doing today. Because we just try because we don't think that way. And so how the parents even get here to bring the kids here to make the appointment to get the incentive to help them with their shopping so that the kids get, you know, some good school supplies and reduce the stress of...so y- you're thinking all these things that you're helping with and not just the diabetes and what you're bringing them here for? How many other useful things that you've been able to do? Right? So even for some of our parents, even making the appointment of bringing their kids here is a big major feat for them. Getting them used to making a commitment, make the appointment, get your kids being responsible getting your transportation here, you know all for an incentive right, but then you're actually doing a whole bunch of other things that just lead up to this one moment. So I know in the literature and how other people think is difficult for us because that's not how we think and it's so hard to just zero in on something, when there's so many other things that you're impacting, because you know your community so well and you know the parents and you know, some of the struggles they're going through. So just these little bits of things that they do on their own just to get here. For some of them it's a big deal. (180502-201)*

#### 4.2.3.6 Mental Health

One topic that consistently came up among the respondents was the importance of addressing mental health among the children and youth, as that can greatly impact how a child copes with

stress, which could lead to unhealthy behaviours such as over eating, lack of physical activity, etc.

*We know we know that a lot of kids coming in probably are dealing with different levels of stress and body image issues and bullying, and all that kind of stuff, right? So there's all these different things that you could see when the nurses would say in on different days of kids came in and you see them at different ages because every year they, they get older in another onto another kind of, another avenue of some sort, and they would raise the issues. So different things we were, we were noticing that we were pulling out of this program, not just for the screen for the diabetes, but whether it would be mental health issues or related. It's all related. (180502-102)*

Children and youth from the program have expressed issues related to their mental health and, as such, Garden River felt that was a piece that should be addressed, as well during the screening process.

*We leave that open for I think until December when people just give up calling in and not to mention now we've rolled out, see now, see. So it's not just about diabetes. We've rolled with our children's mental wellness tool into this back to school program. So we give an additional incentive when these kids come out. So now that we have them here. Let's do our child well-being measure survey. So we use opportunities in all kinds of ways. (180502-201)*

Addressing these needs among the children and youth presented as a key piece to address. If children and youth are dealing with stress, anxiety and depression, and there are no proper resources in place to help them cope, they may be inclined to find unhealthy ways of coping:

*The questionnaire kind of, that's where the mental health piece kind of started coming in. Because anxiety was also a big factor. I found in our reserve. The numbers of people with anxiety and depression are a lot bigger than people I think realize. And it even was affecting the kids, right? So. Some kids were coming in and they are seeking the psychologists for anxiety and depression and things like that, and parents kinda don't know what to do with that. So. Then we started asking questions about, you know...I can't remember what the questions were, I wish they had a thing, but I know some of it were, you know, do you feel more stressed about school, work, home, like we had little questions for the kids to fill out necessarily not the parents. So that was a questionnaire just touching base on kids' mental health because that was important*

*for us to keep an eye on too. I mean, we thought we might as well, right since it's more child focused. (180503-401)*

Over the years, the assessment tools were refined to address how children deal with stress. One respondent mentioned that the four components of health must be addressed to ensure that no risk factors for diabetes are left unexamined:

*But what's not on here, what we added was stress. Because children go through stress as well, and that's a huge risk factor for diabetes. So we did also referrals as you can see on the bottom here, mental health was added. Because you've got to look at the whole person, not just their physical health. But their emotional and spiritual health. So that was also added, was the spirituality part. So the mind body, spirit was encompassed at the end. It's not on the paper really. (180503-400)*

Another respondent mentioned that regardless of if a child was being tested for a physical ailment, the mental health aspect must be considered, because if that is out of balance, then that can compound the physical risks already present.

*Like wholistically? Goes hand in hand. Like you....For all their self-esteem and all the mental health programs that they offer for the children. And I believe it's, it's equal, balanced temple, whether you're going to be doing something physically [or not]. (180503-402)*

One of the ways that Garden River was able to address this need was by hiring a youth mental health worker as of last year. The questionnaire was added that was child friendly and asked questions that would help indicate if there were high levels of mental health concerns. If the survey turned up a certain number of flags, the nurse would be alerted and be able to take the appropriate steps, such as referring the child to the mental health youth worker for counseling.

*This year, it was. They had about I think 40 questions on an Ipad. The child had to go through it and answer them, simple questions based on their mental health. I am happy kind of those kinda questions and whatever. And then if there's any, if they got into a certain zone, of whatever colour. I know an alert, or red, or green or something, and then they'd have to go see...we have a worker [Name]. (180503-402)*

#### 4.2.3.7 Mixed Responses

When looking at what people believe to be important about culture and tradition, it is important to remember that there is no uniform definition or sentiment in what they feel to be pertinent in their lives. One respondent mentioned that there are families who would not consider themselves “traditional”. This could manifest in the foods that the parents believe their child should be eating or the activities that they would seek out for their children to participate in.

*And then you have different definitions of traditional. Like some people will say, well, traditionally, some when, when the white man arrived and their traditional food is, is like the bannock. But that's the flour that came over right, so different definitions. (180502-200)*

There are families that will consider themselves somewhat traditional and some that do not, and trying to categorize people on that definition is difficult to do.

*I guess, I'm not sure how to answer that. Some people are traditional and some people are aren't. If I try to promote traditional food, some people just go, no, no way. I don't eat wild meat, fish head soups like traditional food that nobody except grandmothers used to make. The greens, the farming of it. The gardening. Yeah, it varies. Like some people like it, some people don't like it. So kind of depends on who you're talking to. Yeah. Yeah. Okay. But not everybody's traditional. You can't just put people in that category. (180502-200)*

One respondent mentioned that there are those who do not believe that traditional foods are important for their children to eat; however, she felt that it is with a traditional lens that one can begin to unpack that biologically the food that is available now near the community is not what their people have been eating for thousands of years. It is more than interesting to note that there has been a drastic increase in diabetes and obesity diagnosis that lines up with the diets that many families have adopted in the recent years. She mentions that there was a stigma even

within her own children, showing that there may be a view that children and youth of this generation have towards eating a diet that is sourced and inspired by traditional means:

*But like I said, there is some responsibility that lies within just the individual households. And then there are some parents who aren't traditional and they, you know, they don't feel like it's necessary for their children to learn traditional stuff. But when it comes to like diabetes, I do think it's important because it's important for them to know that our bodies weren't intended to have the kind of food that we have now. And that's why our diabetes number so high. You know if more kids knew that may be it would hit more cords with the kids, and maybe they'd be more aware. Like my kids thought the they always thought it was disgusting that I ate moose, until I explain to them. You know that this is what our people lived on. (180503-401)*

It is interesting to note that there may also be a cultural incentive for children and youth, as parents inform their children that this type of diet has deep roots and is a way for them to reconnect with that which has been taken away.

*It's in their blood. I tell them, you know, just how explaining. So it's in your blood to like this. I said, I promise you you're gonna have a bite and like it because it's in your blood to like it. And they liked it [laugh] I don't know if I said that or not, but because they thought it was in their blood to like it, they liked it and they do they love moose and deer and stuff now, and they eat it so. (180503-401).*

#### 4.2.3.8 Outlier - Humour

One staff member brought up an idea that was not mentioned by anyone else; however, it struck me as a pertinent piece of information to include. She mentioned that humour can play a major role in understanding how some parents react to their child's lifestyle behaviour (food and nutrition, physical activity etc) and a diagnosis that their child is at risk for diabetes. “*Culturally First Nations, people definitely have a big sense of humour. Things that should be serious, aren't always serious because that's just that's just our nature. This is our culture*” (180503-401). This staff member went on to tell me a story that in her own life a physician was shocked that in the midst of an emergency the family was able to stay calm and even joke about the situation:

*She [physician] said with my First Nation clients, in times of like stress and stuff, she said, you guys still can laugh. She said like there's still a lot of laughing. She goes "a lot of times people get stressed, they get frustrated because they're upset" ... And I said, "well, no, that's part of our culture." The humor is always there, even through...funerals unfortunately, sometimes there's lots of life. There's a lot of laughing and there's a lotta joy because it's more of a celebration of life right. That's how we think of it. Instead of it being a super sad time. So I just find even with like children's health, it might not be taken as seriously, you know? (180503-401)*

This particular bit of information, although not foreign knowledge to me, in the context that it was used was something I had not considered and was something that no other staff mentioned. When asked how one could navigate that barrier, this staff member suggested that perhaps one of the ways to reach families that are not attending the program or feel that their child may not need it, is to convey the information in a humorous way that may strike a chord in a way that may be better received than a formal diagnosis:

*Not really, I mean you can't change whole culture's way, I guess is how to put it. I think me, I don't know how to...you would almost have to do it in a humorous way, right? So maybe, I don't know comic about diabetes, I have no idea, something that makes people laugh still, but they're learning from it. You know, like that has information in it, but it's also humor full. You know, you make it funny something. I don't know. Cause it's just there's just things don't always get taken seriously and I don't think that's a bad thing. But like I said, without the incentive, I don't think we'd get as many kids as we did, which is unfortunate. (180503-401)*

#### 4.2.4 Theme Four: Barriers and Limitations

Barriers and limitations was a major theme that was brought up and addressed in every interview. The major ones that exist in regards to this program include consistency, perception and resources. These were the three major areas that staff felt contained deficiencies that impacted the running of the program negatively or have the potential to negatively impact it in the future.

#### 4.2.4.1 Consistency

Consistency was a theme that was brought up several times and in various contexts by the staff. It overwhelmingly presented as one of the key areas that needed improvement in order to see a more effective program being run in the future. The first area to be explored is the attendance of the participants themselves.

##### 4.2.4.1.1 Attendance

One of the challenges that staff experienced with the program was the attendance of the participants. Due to the nature of the program, it is designed to be run during the summer. What this means for attendance is that it can be quite sporadic as families or staff can be on vacation, making the flow of the program unpredictable. This staff member commented on how the program usually picks up significantly near the end of summer and right into the beginning of the new school year, “I know that when it comes like the end of the summer through September, the girls are going nuts because people are trying to get the kids in, you know” (180503-400).

In reference to the name Back to School “Blitz”, one staff member mentioned:

*It's the way we've booked them, and our availability. So that's why I kind of was mentioned a couple of times is that it's been a little bit frustrating because we just we keep doing it and it's like okay, it's right and in the summer prime time. So everybody likes to go on their holidays, whatever. (180502-102).*

The point made by this staff member is that participants sometimes do not show up for their follow-up programming:

*So that's a challenge. But they run, like we used to set it up in the beginning. I think to try and do it the day I was here. But it's just easier to have that wide open for the whole summer. They come in, get screened, and then they go on the list to see [name]. So then somebody schedules them to come back at a different time indeed. I mean, it's a workable. It works. It works. I wouldn't say that's a big barrier, but some of them don't come back for sure. Because they're busy. No that's not a big issue. It's just getting the minor details. Because some of them say they wanna come but then, they don't*

*come back. "Oh ya, we'll come." And then they don't show up and they don't. They don't come back. (180502-200)*

Another staff member felt similar sentiments that recruitment and retainment was a constant concern. Reasons why participants in the program who are sometimes not showing up for their programs may be due to the fact that they are on summer break:

*Definitely recruitment and retainment...There's like, 20 people signed up but really only 5 people show up. That could also have to do with timing. Like it's really nice outside now, so maybe people don't want to be indoors. But it's always with recruitment and retainment. (180503-500)*

Another staff member commented that one of the reasons that attendance may not be consistent is because of the way advertising is done. Other programs in the community angle themselves along the premise that they are programs designed for children and youth who are returning to school in the fall and, as a result, some families may think they have attended *the* back to school program, but have missed this one:

*A challenge is getting them to come in. More advertising, and they have other programs in the community also called the "Back to School." It's been put on the education unit, so it's like, oh, they went there, but they're not realizing that this is another program when they're new to the community or so, it's like. But we do advertise, they have a website that advertises. (180503-402).*

#### 4.2.4.1.2 Follow-up

Staff felt that in various stages throughout the program the follow-up components were sometimes lacking. The initial filling out of the form was sometime perceived to be an issue, as some staff would not fill out the form properly, leaving areas unchecked, or they would write the information in spots where it did not belong. Sometimes the nurse would enter the information into the EMR system, but forget to put it on the sheet of paper, or vice versa:

*Inconsistencies. But that's how you learn. It's to be expected right? Inconsistency of the assessment tools. Of staff filling out the assessment tools properly... So keeping consistent statistics is really important because we need consistent data every year. So we're not going to get consistent data every year because things have changed throughout the years, but. As long as everyone's on the same page and they're filling out the same form. See how they just have written on here height, weight, [points at assessment sheet] and then BMI. Like I was doing it on every single paper. (180503-401)*

Staff members indicated that there is no real strategy in place for how the information should be collected and compiled into a report, and that lack of strategy is responsible for the collection of information that can sometimes mislead, or misinform, those looking at the papers for follow-up:

*And it seems to me it's always hit and miss, and it's like a mishmash of information. And students trying to make sense of something. And there's no real strategy about how we collect that information and roll it up into an annual report. And that, that needs to be done. (180502-201)*

*We need to streamline our forms like the sign-in sheets. If I partner with someone in the community, I need specific steps for my programming and my funding, and they might not necessarily collect that information. So I think we need to streamline our forms than the information that were gathering. (180503-500)*

Once the children were screened, staff felt that the follow-up aspect to the various programming that was offered to help remedy some of the questionable values was too slow, not frequent enough, or was non-existent altogether:

*Definitely the follow up after this this part is one. And then the dietitian is supposed to compile everything also do her part right, put on a program for the children and families. So you're not sure how fast that act... like that hasn't happened yet this year. And this was from last summer. I know [Name] hasn't, the dietitian hasn't. I don't think they put on that program yet.*

*They could have, don't quote me on that, but I'm pretty sure.*

*It's just follow up needs to be a lot faster. (180503-402)*

One of the limitations of the follow-up cooking programs is that they are typically offered once or twice a year. Staff felt that number to be inadequate when trying to instill positive change in the lives of the participants:

*I think consistent programming. Not just a one time a year. I think consisting health education and programming for the prevention of it. (180503-400)*

*Well, there's another issue is limited money unless, Garden River is going to provide it for more, because we'll have one session for kids, one session for teens. So we've only got so much room to have so many kids. So we should. You know, probably have more, more sessions available because it's just like a 1 or 2 sessions for each year, which isn't, that's not a lot. (180502-200)*

Not being able to be available when majority of the screening process is done presented to be a challenge for this staff member:

*See I'm not here the days that they screen. So I come once a week...so that's a challenge. I'm not here the same day because that would get people in easier if I was here the day that they came in. [Omitted] is down the hall just go see her for 20 minutes because then they get booked to come back and they don't they don't show up, cause the day doesn't work for them when I'm here. (180502-200)*

Staff mentioned that the referral process for follow-up programming needed work. Major concerns centered around the procedure of it, that staff did not know when to refer, or simply did not know to refer a participant to a follow-up component. As previously mentioned, there is no formal strategy for referring a patient to a particular follow-up program. Furthermore, once that participant is referred, staff found it difficult to track it, which made it difficult to know if the child or youth ended up going to the program. Some of this centered around the EMR system differentials that exist between staff at Garden River and those at the North Shore Tribal Council:

*Okay. So the referral process and the tracking mechanism needs improvement. And we we don't have a system set up. When I tried to go through the files to see who I had seen. I couldn't tell. So that could be, you know, we didn't know to do that from the beginning, but we should fix that. So we need some kind of a checklist system. This person was referred. I need a checklist. Yes, I saw them because sometimes they'll book appointments, but they don't come in to them. So I'm trying to find out who show up and who didn't show up. Okay. So it's a paper trail process that we need to. To get that, to make that better. (180502-200)*

This staff member also raised the concern that there is no follow-up process after the follow-up programming is done. They articulated that once the child or youth goes through a program to improve their lifestyle and nutritional habits, there is no formal procedure in place to investigate further as to the efficacy of that program in the student's life:

*Another thing would be we don't have any follow up to go back and see how those kids are doing if they've made the changes, kept the changes if they've slipped back to their old ways of eating. So there's no system to, to check on that, and that would be really that would be good to do. (180503-200)*

This staff member also felt that the follow-up process was lacking, as they did not receive referrals from the initial screening:

*And referrals like, no one does referrals into my program. My program as a prevention program. Like we, we, we want to prevent all these. The health issues, right? We don't want them when they have health issues. We want to prevent them so. I wish I had more referrals. (180503-500)*

*Whoever the worker I'm working with might recruit, but I mean they might not necessarily have access to the EMR. (180503-500)*

This particular staff member raised concerns that there are discrepancies between what is considered the appropriate level to refer a participant off to a follow-up component, and that may be the reason why some people were not doing referrals:

*And I think for a challenge was also when to refer. Because the dietitians. And the nurse practitioners had discrepancies as to what normal blood sugar level was, the recommended level when you're fasting. And when it's random. Like a dietitian would say refer at this level and the nurse practitioner would say refer at this level. So I think getting that there is really important. So I think [Name] goes plying the Canadian Diabetes Association. And making sure that the workers are aware of that. (180503-400)*

A possible explanation for this discrepancy lies within the guidelines themselves, and how they may change from time to time. “If the measurements are of abnormal values, so saying the child comes in with A1C’s over 8, and the guideline has changed a couple of times.” (180502-102)

#### 4.2.4.2 Perception

The major concern with perception had to do with how the children and youth felt about themselves. Since anthropomorphic data is taken each time, the majority of the staff noted that some of the participants felt self-conscious about their body. Although steps are taken by the staff to try and mitigate these negative perceptions, it is something that continually comes up:

*The other thing that came on board that was that they noticed was that there was a lot of body image issues. Especially in the tween group or the younger set teenage some of the girls, I don't know if there was any much mentioned above the boys but I could be wrong depending or maybe not wrong, but I may not have that information. But the girls who did the assessments up front. I know from the nurses when they told me they said they were the they took that into consideration right away, and they told him that first of all, that it wasn't something that they necessarily have to do at that time, if they felt that uncomfortable. They were able to take them into another room, more private area. Not that it was open, but I mean, just sort of away, because we would use maybe a clinical room here or just wherever we were. They were maybe it maybe it was other people around. Maybe they thought everybody knew the information. (180502-102)*

*Over the years, there was a few. The girls mostly. And I too, I'm not a fan of the BMIs that are on there, especially with the children because they all grow right a different rates, especially when you are a child. And they've always wanted me to capture that stat, of for body mass. And then we see that chart and where they are and most of them, are obese. They can be playing hockey five days a week and they've got muscle mass right. So. It's, it's really hard and trying to health teach them like, you are healthy or this and their body image in self-esteem, all they see is obese. So I'd like to see that.*

*Body mass index come off of there, somehow.... I've had girls crying in there, and it's really the mental health issue. Stressful. (180503-402)*

Another area that includes negative perceptions potentially being a barrier or limitation to the program has to do with the perception some parents have about how they are raising their child, and what they perceive to be healthy or not:

*One of the challenges is the parents think the kids are healthy. So you have to get around the parents. They don't see their kids as being overweight. So that's like one area you have to be careful with the way, you know you're checking the body mass and, "no they're fine. Yeah, they eat healthy and I cook healthy." So it's like the parents feeling threatened about how they're raising their kids and what they're giving their kids to eat. (180502-200)*

#### 4.2.4.3 Resources

Resources proved to be the greatest limitation/barrier that staff felt they encountered when running this program. The three main resources that were cited were *environment*, *human* and *time*, which often presented itself as a function of the lack of human resources. Funding was also mentioned, but it did not present itself as a major barrier.

##### 4.2.4.3.1 Environment

Staff generally felt that there was not enough space for them to effectively run the program to its full potential. Room availability and size were cited most often:

*And location, like Garden River is expanding so much that there's nowhere for staff and there's nowhere to do programming...It's basically, cause there's no space right? So we have to do our programming at the community centre...So I'll be there, I'll be able to talk and see staff, they'll know what's going on. But there's no space like that in Garden. (180503-500)*

One staff member mentioned that transportation around the reserve is an issue that is worth considering because there is no local transit system to take people around. If someone wants to come to the program, they would need to have access to a vehicle, or know someone who does

and work around their schedule:

*Right. So. Yeah. Transportation is always, transportation is an issue to get them to the clinic. You know, sometimes, the reserves, not that big, but sometimes it's hard to get people here because they have no ride. Or if the relatives gives them the ride they have to pay them. And it's an issue, you know, so not always, but sometimes. So transportation is always an issue. (180503-300)*

#### 4.2.4.3.2 Human and Time

Staff felt strongly that the program could use more hands to have it run more smoothly. Due to the nature of the program, staff felt overwhelmed at times with the volume of students that would attend. Typically, most volume is experienced at the end of August and the beginning of September. Staff felt that having people who were able to assist with the screening process, assemble information packages, compile and categorize the information from the assessment sheets, and assist in the follow-up programming would help the overall program run smoother. Staff also felt that time was an issue, and they were feeling rushed and pressured to see all the participants. Due to the nature of the program, the staff who run it must also continue with their day to day activities, as there are other patients who must come to the health centre. Time was often linked with human resources as a barrier: “And of course, the time and resources were always like because were always limited, you know? Short staff, right?” (180502-102). However, one staff member felt quite strongly that the human resources that are needed to effectively screen the children and youth are already available, and can be done during the year on their own time. The program does well and its purpose is fulfilled by bringing large amounts of children and youth in to get screened and checked for health risks, but the staff are here year-round and nothing should be stopping the parents from bringing their children in during the year for regular checkups:

*Well, I mean, we're here, the health centers here for this no matter what. I'm glad we run this program, but anybody can make their child appointment just to get them checked up, right? You don't need a program like this to do that. So I feel like for the community, the resources are already here. You know, there's a dietitian that's here. You know? Once a week there's a physiotherapist that's here once a week. There's nurse practitioners that are here four days a week. There's a doctor that's here once a week. You know, this community isn't without resources as far as I'm concerned. (180503-401)*

Another staff member mentioned that in accordance with her daily schedule that exists outside of the program, it is difficult to find the time to fit the children and youth in:

*So yeah, more human resources would be great. It's a big program to run when I have all these other programs to run also. So it's like which day am I going to do it kind of thing. So it's not where I had my calendar open to take in these families, they call and say I'm only available this day. And you don't want to turn them away, right? And well my schedules full, and if you don't have a scheduling program and a lot of little mental issues that they're working on working on. So extra help. Yeah. Is going to be needed this year, definitely. (180503-402)*

In terms of the follow-up programming, it was mentioned by a staff member that the programs need to have access to a dietician or a diabetes nurse educator. Since these are individuals with specific education and are provided by the North Shore Tribal Council, not all staff are qualified to provide the services needed:

*You need people to run them. Like I can't run things because I'm not a dietitian or not the diabetes nurse educator. Like there are things I can't do. (180503-500)*

One staff member mentioned that the lack of human resources continually puts pressure on the Health Service Supervisor. This person felt strongly that there should be a staff member that could inform the best practices needed to run this program most efficiently:

*We don't have the resources to be able to roll out an effective strategy. We have a health services supervisor, who is, I think, overwhelmed. There's a lot going on in the area and it's just something else added onto her plate and she's doing the best she can with lack of resources. So... we then don't know what kind of person that should, could be? We don't have enough expertise in that area to really say, here's what a strategy should look like built on best practices around a screening program for kids. Here's the strategies. Here's everything that you need to do. Here's all the checklist, the program right from the end, even including the evaluation of what needs to happen. Right up to the roll up report. (180502-201)*

Staff mentioned that time is an issue with regards to when the program is run. Since the program is run in the summer, many families go away and that can contribute to the sometimes “hectic” nature of the program toward the month of August. The program was even extended into September to allow for more families to participate:

*So just be a matter of timing because you have to remember it's short time frame that we're getting these kids. So if we're getting them out of the gate in June schools out. So when they when there at the end of coming out of school, June, that they don't all necessarily just flood in here because they're on their summer holidays. So we would see probably the bulk of them coming in. They sort of all kinda trickle in here the mid-summer. But then as August came, you know that they're getting closer to going back to school for that. Then we would support them and still offer it in that we ended up extending it too. I think the first couple of years we did like just right at the end of the summer like it was done. But then we found that if we opened it up until September that gave us that extra time, you know, for families to get back from, you know, if they were away. Some people go away for the summer. Some people they're just they just want to totally write off everything and just relax and have a good holiday. So we gave them that time because they're still getting settled in school. And so we, the last few years. We extended it till I believe September. We stretched it out. Yeah, because they don't really get out of the gate in June, like they're just getting out of school. (180502-102)*

Staff commented that the program would not work if it was done during the year, because participants would be in school and parents would be working. Due to this, the program would sometimes be extended into the evening.

*With running, and in the summer worked better, not always for the working parents, but the kids are available right from morning to the end of our work workday. If we tried to run it at any time through the school year, that's not possible Monday to Friday, obviously, because they're in school. So summertime was the only time that we could kind of run it so that we could book them all day. Unless we ran evening clinics, that we did do that sometimes were we'd run in evening clinic. If there was kids that didn't get seen through the summer and they're kinda like stragglers at the end, we would stay in the evening and catch the kids after school and stuff. (180502-102)*

Staff mentioned that due to time constraints they sometimes felt overwhelmed and felt pressured to accommodate families while attempting to meet the deadlines from their other duties.

*I'm doing my thing cause I'm busy. Pretty busy, four days of the week. Today's our admin days to do our catch up... like I said, then you have family saying I can't come in till this time. And then that time is always like ugh...I'm trying to set a policy, like do it this way, but you're always overstepping. You're there for the clients right. (180503-402)*

One staff member shared that the timing of when other programs are run can cause barriers for people who need to attend the follow-up programming from the initial screening:

*Yeah. And then I think sometimes too, I'm competing with other programming cause I know... I saw leaving the Wellness Center from a different program that was happening at the same time. (180503-500)*

#### 4.2.4.3.3 Funding

Some staff felt more strongly than others that funding was an issue in relation to follow-up programming. Due to the funding structures, Garden River does not receive funding for hiring their own dietician, as they are provided one through the provincial Aboriginal Health Access Centre N'Mninoeyaa, who is there once a week:

*We don't get funded like federally, like through our through the funding model that we have with Health Canada for a dietitian, that's just, we don't get funding for that. Usually what they do look at is, you know, referring to provincial services may be through the through the health unit in the provincial health unit and maybe tap into a dietitian there. Or if there was a dietitian, like the Sault Ste. Marie has the group health*

*center and they have dietitian services, but not everybody is a member of the group health centre. (180502-102)*

One staff member mentioned that money is limited for the running of programs; however, because Garden River First Nation subsidizes the cost by providing food and necessary supplies, more programs are able to be done:

*When there's money, there's so much money for programs and there's so much money for travel dollars. So. Well, there's only so much money in the budget...If the communities are providing the resources like the food, money, then we can do more programs because from... Mamaweswen [there is] only have so much money to put into programs. (180502-200)*

In one particular case a lack of money was discussed as being an issue for families themselves. It was often told to this individual that purchasing healthy food and finding transportation to the clinic was difficult to do: “But I think when it comes to the point where you are trying to teach them about proper diet and what they need to do. Money's an issue. Good food is expensive.” (180503-300).

*Yeah. Transportation is always an issue from off reserve. Transportation and cost. I mean that's basically what it boils down to. So I mean if you were on reserve and you have the, if you don't have people within your own community to be able to help with that. To have the dollars available to bring them in. (180503-300)*

## 4.2.5 Theme Five: Facilitators

### 4.2.5.1 Consistency

Consistency presented as a strong facilitator to the success of the program. One respondent mentioned that the essence of the program has always been to screen the children using anthropomorphic data, and although the screening tools for other areas have changed, that remains a constant.

*Those kinds of things. So it's just something like I said, we've been doing in every year for like going into the 11th year. And now we've changed it added a few things here and there, but I think the main message that's been consistent is the kids come in and they get screened, like that's been consistent all the way through. So we definitely have our quantitative data that shows the outcomes, like the measurements and the BMI's. (180502-102)*

The same respondent mentioned that in order for the program to be consistent when carried out, the right prep work must be done. This included gathering the screening forms, glucometers, scales and all other equipment that would be used, and ensuring that everything is in working order.

*Making sure that that was all in place for them, making sure that was available to them. And then if we wanted to do any resources, making sure that they had the available forms and sheets that they needed, all of the prep work that they would need to clinically support them that way, so that they could do the job that they needed to do. (180502-102)*

The other piece that must be consistent is the running of the program and the fact that the program was put on for 11 years without wavering. When a program is established in a community, the families come to know and expect it, and make time to go.

*Like I said, I'm not involved as much unless they come to see me. But I think the fact that the community is used to having it offered every year before school, so they know it's coming up. There are quite a few people that bring their children here to be assessed. (180502-300)*

Parts of the program, such as the incentive, is a component that is continually offered, which is a tool that families can come to expect. They know each summer that this program will be offered and, as a result, their child will be screened for diabetes and they will also receive a gift card to help prepare for when the child goes back to school. Another factor that showed to be essential is the staff that runs the program. The longer the staff are there, the more familiar the children become with them, and there is a level of trust and comfort that is built. This allows for the health care provider to speak into the lives of the children with the voice of someone who is familiar.

*[They] have incentives to get people to show up. And that's been really successful around here. I think the fact that they have the RPNs doing the program plus the dietitian sometimes is there. So they're introduced already to the people that they're going to be seeing that especially the dietitian, if she's around. That can provoke provide the information that they need initially to start thinking. It's working. It works well. They do it every year and it's getting busier every year. So. You know, so I think those are the things that probably the incentives and the fact that the program is an ongoing every year. People are used to it. So it wasn't a fly by night with other, do this and not do it any more. (180502-300)*

One of the questions that I asked the respondents had to do with their time at Garden River. A majority of the staff have been a part of the program since the program's inception and have demonstrated a vested interest in the community members. The majority of staff are from Garden River and have established relationships with the children and youth who attend the program. This consistency undoubtedly helps ease stress and anxieties that may be felt by the participants in the program.

*But I mean the hard to find right now cause I think all we have right now in Garden is female nurses. But I mean, we tried to make them as comfortable as possible, and I grew up in the community so everybody knew me. And to be honest, I babysat tons of the kids out here. So a lot of them already knew me and everything. So I hope I made them feel pretty comfortable here. (180502-401)*

#### 4.2.5.2 Follow-Up

As discussed in previous sections, one of the areas of the Back to School Blitz that is a key area to address is the follow-up aspect to the screening process and questionnaires that are filled out by the students and/or their parents to identify risks and mitigate them. If a child showed positive signs for being at risk of being diagnosed with diabetes through a high blood glucose reading and/or the presence of Acanthosis Nigricans they were immediately referred to a nurse practitioner or their family doctor. When asked about some of the positive outcomes from this program, one respondent mentioned "catching people with high blood sugar. Like in our

programming, otherwise they never would have known. Getting them to go see their doctors” (180503-500). The follow-up component to the program is itself a facilitator, as the programming put on by the staff help children and youth develop healthy behaviours in a fun way. Having this component built into the initial screening strengthens the efficacy.

*So that went really well. And then we didn't have that many clients diagnosed but we did, through our assessment and we did find a few each year through fasting blood work. So they would come in and you would draw their blood. Some people were diagnosed that way, and then referred to the appropriate health professional. So it's nice that we were catching these early. (180502-102)*

For children who had a first degree relative with diabetes, BMI over the 95<sup>th</sup> percentile, who indicated through the questionnaires that their lifestyle reflected one that could contribute to obesity and diabetes diagnosis (poor diet, low physical activity, high screen time, high mental stress, etc.), that child or youth would be referred most often to the dietician for programming. Other personnel that Garden River First Nation can refer to include a physiotherapist, psychologist, traditional services, chronic disease nurse and most recently a mental health youth worker. Typically, most staff mentioned that the children and youth would be referred to the dietician for programming. These programs would most often be run in conjunction with the Health Education Promoter and a Diabetes Nurse Educator or Nurse Practitioner.

*So positive outcomes are people who are coming in to get into advice. Then they're coming in to learn new cooking skills. When we do the cooking, we also do some, teaching and education at that time, also it's hands on, so they're getting exposed to foods that they don't normally eat or they, refuse to eat at home, or their parents don't buy because the parents don't have that information or education so they can educate their parents same time, their siblings to start coming in and accessing nutrition information like healthy nutrition information, learning new skills, and going away that and hopefully making changes to their lifestyle and eating habits. Then they spread the word to other people. (180502-200)*

The focus of these programs is to teach children and youth that eating healthily can be fun and an experience that they may actually enjoy. It is not about just about reducing the numbers on the scale, but instilling life skills in the students that they can take with them for the rest of their lives. Staff felt strongly that the option to have follow-up programming for the students and their families made a difference. It is not enough to screen the children and youth and tell them that they are at risk; steps need to be taken to teach them healthy, beneficial tips and provide the tools to make a change.

*Personally, I think it just helped for people to...cause not everybody realized that their kids eat poorly until they answer a bunch of questions and realize that maybe they have a fruit a day. Then they realize, well the suggestion is two to three a day, or they realized that the child drinks this much pop and they didn't even really realize they drink that much pop, you know, things like that because once you put it in perspective, I think a lot of people are more aware. So I think that was really good with the program. That's why we did prefer to have the parents here. Cause I mean the teenage siblings, might not care so much obviously about what their younger siblings either don't eat. (180503-401)*

#### 4.2.5.3 Participant Perception

The perception of the children and youth who take part in the programs is a strong facilitator simply because if the children did not enjoy their time, they would not be coming back each year. Talking to a child or youth about their body and how they may be at risk for diabetes can be a scary and overwhelming topic. Making the participants in the program feel at ease and cared for is something for the staff at Garden River First Nation truly strive to do:

*So they were able to just kind of take them aside and talk with them and say, it's okay like, you know, it's all part of your growth in development but explaining to the reasons why you know, the weight had to be taken what it was part of, so they wouldn't enforce them, but they just explained as any nurse would you know, provide support and that they were able to do that. I think they kind of considered a different way of approaching them so that when they came the next time they said, don't worry about this apart. This is what we're going to do or so they did different approaches, different ways of talking with them. Setting more time aside to talk them through it. So they recognize that they*

*weren't just coming in getting these assessments done and then out the door. (180502-102)*

Staff mentioned that it was sometimes difficult to get children and youth to attend the follow up programs. What helped to facilitate attendance was the fact that the staff was consistent with them, that they knew the children from the previous years and that they made the program an enjoyable experience:

*Some of them like it. Some of them have to be coaxed. And then when they're coaxed, whether it's their parents or their siblings or their peers. I think they have fun. Some of them, of course, don't, don't enjoy trying new foods, but at least they are there. But the one of only the ones that come out, it's, they like it. Some don't ever show up, so we never get to those kids. But I noticed that the more we do, the more they're willing to show up and make some changes. Even try new food. So when you see this same kid, so the more that's offered, the more that they can come actually, the better. (180502-200)*

This respondent mentioned that they found there was greater attendance if the program was done as a group. Having group sessions appeared to help children and youth feel that they were not the only one struggling with these issues, and that there were others who could empathize with them:

*I believe they would put on a program and a lot of times they won't come back into do a reassessment because of their, say, if I get a high sugar I'm obviously gonna alert them to go see their family practitioner, or come make an appointment with the dietician or nurse practitioner, just a follow up to make sure it wasn't just abnormally high for some reason and follow up with that. But if their lifestyle eating habits aren't great then they would put on a program. They weren't coming in individually, I find over the years when we called them back. So then now they just to kind of a group they try to do a group program, and you can get more family that way. (180503-402)*

One staff member mentioned the use of visual aids as helping to facilitate a positive environment for the students. Having visual aids that can educate a child on the amount of sugar they are consuming proved to be helpful and a way for the nurse to communicate the dangers of poor nutritional habits:

*When you make it like when you have like visual things, that made it interesting for them because they see, they see. A lot of kids learn by seeing. So if you show them like how much sugar is in a can of pop, Gatorade, chocolate milk. That kind of stuff. Visual aids are really helpful. I found it really broke the ice. Okay. (180503-400)*

#### 4.2.5.4 Staff Perception of Seeing Change

Staff noted that seeing change in the children and youth is a positive part of the program that can facilitate attendance and participation in the future years. Staff noted that children who came in and had reservations about being there were given an enjoyable experience and left with a positive perception:

*When the kids come and they don't want to be there. The- the- they have fun, and they actually try something and may like it. They they're happy that they're learning a new skill. And then they, they go away happy. Even the ones that come for individual visits, when they come back. Or you'll hear from a grandparent that that they're, they're not eating at McDonald's anymore. So it's more like a story that will come back. And there's one particular girl that. She won't eat fruits and vegetables, so now she's actually she's coming to programs because her mom's bringing her and she's actually trying new things now. (180502-201)*

Staff were able to create an environment for the participants that was safe and memorable.

This respondent recounts that a simple token such as a cotton ball was used as a way to remind the participants that the pain is temporary, and they are doing something that requires bravery and will be helpful for them:

*I just really liked interacting with the kids because they open up to you. Getting them past their fear stage of getting their finger pricked. That was a challenge [chuckles] that was a big challenge. They're are afraid of the prick. So you get the bravest family member to go first or the mom will go first. So we figured that out, like you get through that part. They have that fear so. There was one little boy, I remember. So I always use this term after. I'd call the cotton balls, He'd called the cotton balls comfy balls. The little cotton...so he would come in every year and he said, do I get a comfy ball this year? Like he would he come back every year he remembered how good it felt put the cotton ball on his finger after we pricked his finger [chuckles]. So the little things to bring them comfort. Right. Oh, it was just nice, when they would open up. (180503-400)*

One of the goals of the program is that it fosters a desire to live a healthier life and one of the ways that happens is by creating an experience for participants that encourages them to take steps on their own outside of program time to better their health:

*There's a lot of, a lot of laughing, a lot of sharing, and creating support. So I've had programs where people do stuff outside of programming, they meet up and go for walks and stuff. Or like, I've had people who've lost weight in [the] program. (180503-500)*

#### 4.2.5.5 Resources

Staff felt that more resources such as environmental, funding, human and proper tools would help the program run more smoothly.

##### 4.2.5.5.1 Environment

One staff member mentioned that having a recreational centre is a bonus for Garden River. The spaces allow for clinicians to run programming that can effectively and affordably reach children. Although it was mentioned as something beneficial, it was not a requirement to have:

*Facilities to help them to... like community kitchens. Family kitchens where they can teach, teach the families how to eat healthy, how to cook healthy, how to shop healthy. If you're lucky enough to have a rec center like they have here, maybe they need some programs out there to get the kids in moving that don't cost an arm and leg to get them so that they can find out what they can do and have trainers that can show them... You don't have to have a big, fancy rec center. (180502-300)*

Another area that would be beneficial would be to have some sort of transportation system or people to help out with that, “so I mean if you were on reserve and you have the, if you don’t have people within your own community to be able to help with that” (180502-300).

Facilities with large rooms for the screening process as well as the follow-up programming would also show to be a facilitator for the nursing and staff to carry out their roles more

efficiently, “things like a bigger room, staff. teaching aids” (180503-400). “We have to do our programming at the community center. So you have to take that when it's available” (180503-500).

#### 4.2.5.5.2 Proper Tools

Staff felt that in order to run an effective program the proper tools must be in place. For some staff, that was making sure the questionnaires and surveys were evidence-based and researched. It was important to them to do the necessary searches to ensure what was being implemented would have maximum impact. Additionally, having a professional who has experience in the field but can offer an etic perspective proved to be a strong facilitator to the program:

*Sort of looking at those (RNAO/CDA) clinical guidelines was a big part of it. And, then as we, as you know, as I looked into that, I also mentioned the conversations that I had with Dr Elizabeth Sellers from Winnipeg Health Sciences center, Endocrinology Department. And sort of getting her opinion on that because of the work that she had done in her published articles on, she did some interviews as well on Aboriginal diabetes rates in the youth. (180502-102)*

*We did a lot of research in terms of norms and what levels were and what the risk factors were. That kind of stuff to put it together than to get the forms completed by the staff of the parents, so that they were accurate to develop then when we reviewed them to make sure they were right and that kind of stuff. (180502-300)*

Staff believed that it would be valuable to have tools and resources that are made available in other programs, such as visual aids and new program ideas. One staff member shared that because she is not a teacher, she was denied access to certain educational tools. Tools that are made available for educators may act as facilitators, but barriers for someone who is not, as noted in this particular instance:

*Because there's things I've done it before and they go, oh, well, you're not a teacher. You can't order from us. Yeah, I forget what that's to deal with, but it was something to do with nutrition. And they wouldn't let you are because I wasn't a teacher. And it*

*was like a school program, that was for school. Because I don't work in the school system. I couldn't get my hands on it. (180502-200)*

Staff also felt that having visual aids is a very useful tool, especially for explaining to young children the sugar and fat content in some of the foods they eat.

*And then we have I think having more visual tools to bring in like when you see how much sugar is in certain drinks, how much fat accumulates in your arteries. Like visual tools. I think we need more of those. When you make it like when you have like visual things, that made it interesting for them because they see, they see. A lot of kids learn by seeing. So if you show them like how much sugar is in a can of pop, Gatorade, chocolate milk. That kind of stuff. Visual aids are really helpful. I found it really broke the ice (180503-401)*

*So you need the people, you need resources like I've a lot of health promotion display items to make it visual for people. If we're doing a cooking program, I can make sure I have cooking supplies. (180503-500)*

#### 4.2.5.5.3 Incentives

One sentiment that was expressed by some of the staff was that the incentive offered by the program is the main reason parents take their children in the first place, and as such would be a very strong facilitator for some families who otherwise would not take the time to attend the program:

*And then, like I said, the incentives are probably what brings people in. I mean, it will be nice to think that it was. Yeah. My child's health. And I'm worried [chuckles] the fact that you're getting a backpack full of school supplies probably has something to do with that. And I'm not even sure if that's what they do every year, but they've got incentives every year, whether it's Walmart gift cards or something to bring them in. And I think that's probably how they bring them in. (180503-400)*

*Without incentive, it's hard to get people to come out and participate, which is kind of unfortunate. You know, you hope that parents are concerned enough about their children in preventative health. But not everybody is with that gift card being there. That definitely brings people out. So. I don't know. I just feel like. That is something I don't know how to word. (180503-401)*

#### 4.2.5.5.4 Human

Staff felt that the program would greatly benefit from someone who was able to step in and alleviate some of the pressures the staff are feeling. This person should understand how to identify and implement the best practices and aid not only in the running of the program, but in the compilation and aggregation of data once the program is finished.

*Well, you need staff. You need what you've got here. If you're starting that up in another community, is that kind of where you're going with this? I would say that you need the health professionals that can research the data, to know the community well enough to know what's needed. Then you need enough personnel to be able to pull it off the way this program is run, you've got the nurses involved, you got the dietitians involved. Hopefully physiotherapist would be involved if there was enough time. (180502-300)*

This staff member felt that student nurses would be beneficial for administering the program, as they would not only help alleviate some of the pressures felt by the staff, but they would be able to be consistent with the filling out of the assessments. In the past, as discussed, students were involved in aggregating the data, but perhaps could be given a greater role:

*It would benefit from like even the student nurses running it. You know, if we had some student nurses, if they ran this program or took on. But see, they can't take on our jobs necessarily right so they would have to run this program under our supervision more or less. That would probably be more beneficial. (180503-401)*

Staff also felt that it was important to have collaboration with the staff when the program is run, that goes beyond interactions once a week:

*I'm not sure like. Because like I said, I just do the nursing component, I don't know if there can be like a day where the dietician is on site, and we can do something together as a team. So then you know, you're getting it all and maybe just to one whole week. Because there's a lot of children obviously to focus on that, especially the ones that want to come and do this and if there is follow up right away. Implement that way. (180503-402)*

*So I think all the staff is at the wellness center. So I don't see anybody, other than the one specific staff member I partner with run the program. (180503-500)*

## Chapter 5 Discussion of Results

The purpose of this section is to analyze the results in a way that is meaningful to Garden River First Nation as well as other communities that are contemplating implementation of a program of this nature. This section will be used to develop a *process model* based on the data collected in this study that can be used by interested communities to create a program of their own, or refine an existing program, as in the case of Garden River. Based on the feedback from the respondents and multiple conversations with the Health Services Supervisor, the approach that will be taken in this section will be one that addresses some of the major concerns brought forth in the conversations while offering recommendations for ways to improve the current situations. The recommendations were requested by Garden River in order to have an impartial third party (myself) comment on what the results of the study are indicating and indicate potential areas of improvement; and are to aid in the action component of the CB-PAR methodological approach. The scope of this section is to use the feedback provided by the staff at Garden River First Nation to understand what makes an effective obesity and diabetes prevention program. Literature and sources found in the most recent guidelines from the Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada will inform this section, as it is a tool that was used by Garden River First Nation in previous years to establish their own guidelines and practices.

### 5.1 Theme One: Program Details

Staff mentioned that the need for a screening program arose from national data that suggested being of First Nation descent is an automatic risk factor for developing diabetes. Staff also suggested that the community itself has a history of having a high prevalence of type 2 diabetes,

and that prevention and screening for their children should be a top concern. Garden River therefore, began a screening process which evolved to include risk factors for diabetes diagnosis such as a first or second degree relative with diabetes, BMI over the 95<sup>th</sup> percentile and/or the presence of acanthosis nigricans. A blood sugar test is also conducted where the optimum range is 5.0mmol/L to 9.0mmol/L (Appendix I). The screening tool that Garden River employs currently is one that lines up with best practices from Diabetes Canada (2018) when screening Indigenous populations for risks such as a first or second degree relative with diabetes, the presence of acanthosis nigricans, being a member of a high-risk population, having impaired glucose tolerance and a BMI over the 95<sup>th</sup> percentile (Crowshoe et al., 2018; Panagiotopolous et al., 2018). These guidelines recommend that screening for children occur every two years for both children who present with three or more of these risk factors (in nonpubertal children beginning at 8 years of age) and for those who present with two or more risk factors (in pubertal children). In addition to these risk factors, guideline recommendations outline that children and youth who present with any combination of either polycystic ovarian syndrome, impaired fasting glucose (reading over 7mmol/L) or the use of atypical antipsychotic medications should also be screened every two years. However, there is nothing suggesting that screening annually is erroneous. Since Garden River seeks to refer patients to healthy lifestyle programs if a patient is at risk, it may be pertinent to continue screening each year.

Point-of-care (POC) screening instruments that measure a combination of A1C and fasting plasma glucose (FPG) levels have been shown to be highly effective in identifying diabetes in remote communities; however, these units require professional knowledge and are currently not approved for use in Canada (Marley et al., 2015). The recommendation for identifying the presence of diabetes is the fasting plasma glucose, although it may be a challenge to ensure

accuracy. A fasting plasma glucose reading taken after at least 8 hours of fasting that is greater than or equal to 7mmol/L indicates the presence of diabetes. A random plasma glucose reading greater than or equal to 11.1mmol/L can also be used to indicate the presence of diabetes, although a follow-up fasting plasma glucose reading should be done (Punthakee et al., 2018). A two-hour oral glucose tolerance test greater than or equal to 11.1mmol/L is also considered the gold standard for the detection of diabetes and is recommended as an initial screen for children and youth with three or more risk factors (Panagiotopolous et al., 2018). This test, however, has drawbacks as it is time consuming, costly and often unpalatable (Punthakee et al., 2018). Garden River's decision to include lifestyle and nutritional patterns (number of sugary drinks, servings of milk and milk alternatives per day, servings of vegetables per day and number of fruit per day), is in line with guidelines that suggest children should be limiting sugar intake and opting for healthy foods such as more fruits, vegetables and milk and milk alternatives (CTFPHC, 2015; Laverty et al., 2015; Te et al., 2013).

The questionnaires that Garden River administers to children, parents and guardians are tools that are used to better understand the lifestyle (nutritional, physical activity) levels that the children have. The physical activity questionnaire is designed to be filled out by the children themselves and is based on the Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) by Kowalski and colleagues. The parents/guardians are given a caregivers' assessment questionnaire to fill out that is used to describe eating and lifestyle habits, including nutrition, eating habits, breastfeeding, portion size, screen time, sleep quality as well as child stress (home, social, work, other). These questionnaires, although not explicitly recommended by the Diabetes Canada (2018), give valuable insight into areas of the children's lives that are, and that should be monitored. A lack of physical activity, poor nutritional habits, a

lack of breast feeding, poor sleep quality and stress are all factors that can contribute to obesity and diabetes among children and youth (Crowshoe et al., 2018; Panagiotopolous et al., 2018). Children who have diabetes or are at risk should be achieving a minimum 60 minutes of moderate to vigorous physical activity a day in order to help mitigate the disease (MacMillan et al., 2014); however, accumulating even minimal amounts of moving can be beneficial (Warburton and Bredin, 2017). Breastfeeding is also encouraged for Indigenous mothers as it can reduce the onset of diabetes (Young et al., 2002).

Staff at Garden River felt the use of anthropomorphic data to be somewhat of a contentious issue. Staff commented that the use of BMI should not be all and end all of determining risk levels, as bodies are constantly changing, and BMI does not take into consideration muscle mass or activity levels. In addition to this, the majority of staff commented that negative body image, experienced mainly by female participants, was a common occurrence. Staff mentioned that participants felt uncomfortable being weighed, and there were instances where participants would cry. One staff member mentioned that the use of BMI is being phased out in the follow-up programming. According to Diabetes Canada (2018), a BMI greater than the 95<sup>th</sup> percentile is considered a risk for diabetes, especially in children and youth. Garden River has been doing a great job thus far ensuring children and youth feel comfortable, and informing them that they do not need to be weighed during the screening process. Garden River may wish to continue using BMI as a risk factor, as it is still one of the primary indicators for diabetes diagnosis (Ahmed et al., 2010).

The follow up programming carried out in Garden River (Table 2) is geared towards both prevention and management. Participants who are referred to these programs are either at risk for developing diabetes or have been diagnosed with diabetes. In both scenarios, lifestyle changes

are necessary and are mandated through the culturally appropriate programming made available by the North Shore Tribal Council and Garden River First Nation itself. Interventions geared towards Indigenous communities in Canada from 2008-2014 have all incorporated key tenets such as healthy behaviours education, physical activity, healthy food consumption (increased milk products, vegetables, fruits, reduction in fatty processed food) and reduced BMI (Eskicioglu et al., 2013; 2014; Gates et al., 2011; Harries et al., 1997; Horn et al., 2007; Ronsley et al., 2013; Tomlin et al., 2011). The programs offered by Garden River as follow-up components to the initial screening are all mandated to address most, if not all of these variables, either directly or indirectly.

### 5.1.1 Recommendations

The mandate of this program is to provide an initial screening using either fasting or random plasma glucose; however, the assessment sheet does not specify the recommended levels for *fasting* versus *random*. It is recommended that the assessment form indicate that a fasting plasma glucose reading should not exceed 7mmol/L and a resting plasma glucose reading should not exceed 11.1mmol/L. Both values should be present so as to not cause confusion among staff, as that was an issue that was raised. It is also recommended that the screening tool have a space to record height and weight, as staff members mentioned that there was no place to write it, and it was often in different places.

Furthermore, the screening tool has evolved to include a section where staff can refer a patient to either a: nurse practitioner, physician, registered dietician, physiotherapist, psychologist, traditional service, chronic disease nurse or, most recently, a mental health worker. Staff should decide together on the parameters used to refer a child to one of these services as well as proper technique for filling out the form. One key point that was raised was that there is no option for

referral to the Community Health Promoter, who is someone who often runs the follow-up programs with the registered dietician. Having this option would allow for children and youth to be placed into an appropriate program that suits their needs, as well as taking some of the burden away from the registered dietician having to follow-up with every student.

While the questionnaires are very informative and provide valuable insight into the daily lives of the children, staff felt that there are a lot of questions to fill out and it can be time consuming. Staff should discuss the importance of having these questionnaires and should consider making them available to families online to fill out before coming to the clinic.

The majority of programs recommended to children are linked to food and nutrition, as they are often referred directly to the dietician. Due to this nature, the physical activity component is something that appears to be lacking in comparison to the food and nutrition programming.

Garden River staff have collectively agreed that physical activity is important, as evidenced in conversations as well as the questionnaire that is administered to the children. Garden River may better serve the population by including referrals directly to the Community Health Promoter, as previously discussed. Programs run through this individual include components with physical activity administered by a certified trainer and would not require additional commitment from the staff themselves other than the initial referral process. The Community Health Promoter is someone who is well versed in engaging and leading physical activity and is a licensed yoga instructor. Collaborations between Garden River and this individual will further strengthen the follow-up programs and allow children an opportunity to wholistically address the risks associated with diabetes.

## 5.2 Theme Three: Incentives

As discussed throughout the study, the use of incentives has been instrumental in facilitating participation of children and their families in the initial screening process. Staff reportedly discussed that the incentives act as key motivators (in some cases the only motivator) in bringing families to the Health and Wellness Centre for screening during the Back to School Blitz. While some staff had mixed emotions on the matter, it was found to be consistent across the board that the \$40.00 gift card given to parents of young children, and directly to high-school students, is a tool that can help deal with stressors that prevent and inhibit the adoption of healthy behaviours. Sutherland and colleagues (2008) conducted a systematic review on the use of incentives on personal health behaviours over the years 1995 to 2007. The review focused on studies in both the private and public sector. The public sector showed that the incentives were directed mostly to low-income populations; however, no studies were done with Indigenous communities and diabetes screening. Generally, two types of incentives exist: direct (cash, gifts, etc.) and indirect (reduction in cost sharing, free or reduced-cost products, etc.). With respect to cancer screening, three studies cited in the review by Sutherland et al. (2008) showed that socio-economically disadvantaged women who received a financial incentive had improved follow-up after an abnormal Pap smear test. Two studies testing transportation incentives or \$20.00 vouchers to increase follow-up among socioeconomically disadvantaged women was found to be effective as well (Abercrombie, 2001; Jepson et al., 2000; Kane et al., 2004). Two review articles cited that post-natal care among low-income teenagers found economic incentives significantly increased appointment keeping where coupons were given (Giuffrida and Torgerson, 1997; Kane et al., 2004).

### 5.2.1 Recommendations

The studies reviewed and conclusions drawn by Sutherland et al. (2008), first proposed by Kane (2004), suggest that preventive behaviours can be divided into simple and complex behaviours. A simple change may be completing a health-risk assessment, much like the screening program that Garden River does for their children and youth, and can be accomplished through a small incentive program, like the \$40.00 gift card to Walmart. Complex behaviours, such as dietary and exercise changes may require a more sophisticated reward system that incorporates various different types of incentives over a period of time. The nature of the incentive as being a bonus for achieving goals or as a penalty for undesirable behaviour is also important. Participants may be incentivized to attend the program based on merit, as in the case with Garden River's program, or they may be incentivized to attend due to fear of being diagnosed with diabetes. The latter takes considerable health education and depends on the health literacy of the participants and their families. Garden River seeks to educate participants in all the programming they do, which is an example of organizational change, and is a type of incentive in and of itself. Interestingly, Stone et al. (2002) found that organizational change was the most effective intervention for incentivizing people to participate in colon cancer screening. Examples of this organizational change in the studies mentioned by Stone and colleagues include separate clinics devoted to prevention, use of a planned care visit for prevention, or designation of non-physician staff to do specific prevention activities. This type of incentive actually proved more effective than the use of financial incentives. By offering educational, follow-up programming to children and youth, carried out in spaces held at different times and in different locations, run by staff from the community and the North Shore Tribal Council, Garden River First Nation has been offering, in addition to their financial incentive, a complex incentive that is key to instilling

behavioural change. These types of accommodations, put in place by the staff, have shown to be effective and will be discussed in the facilitators section of the discussion. In addition to these incentives, Garden River does not charge its community members a fee for most of the programs, which is a type of cost-reduction incentive: “What time they're occurring at, and what the cost is, but most of the time there's really not a cost for programs” (180502-102). According to Sutherland et al. (2008) cost reduction has been shown to increase participation in screening and other health-based activities.

Based on some feedback from respondents, that attendance to follow-up programming was sometimes suspect, Garden River may wish to split the financial incentive, so a portion is received upon initial screening and the rest received during attendance to a follow-up program or picked up at a later date if no follow-up is needed. Sutherland et al. (2008) state that considerable health literacy is needed for patients/participants to grasp the benefits from changing poor health behaviours and, in these cases, larger financial incentives may be needed. This may be the reason why organizational change and cost reduction are not perceived as incentives by community members, since some may not realize that these programs are often expensive to run and take skilled professionals from varying vocations to work cohesively.

### 5.3 Theme Two: Culture and Tradition

Crowshoe et al. (2018) outline ways that culture is a key component in delivering health care to Indigenous populations, and involves examining ways that culture is *therapeutic, informs relationships* and *frames knowledge*. The therapeutic nature of culture is that it is protective of Indigenous populations and the use of traditional medicine and ceremonies are typically desired for accessing and re-connecting to culture while still utilizing Western health services. Garden

River does a wonderful job of providing programming for families and services that are culturally and traditionally based and appropriate. A referral to traditional services is an option for every child and youth that attend the program, and includes options to participate in cedar baths, smudges, naming ceremonies, healing with traditional medicines etc. Garden River emphasizes a healthy diet that is based on the First Nations Food Guide. Garden River also respects that there are families who do not believe in traditional healing and do not seek to force anything on-to anyone. The respect for autonomy is something that is a cultural behaviour and is an example of how the principle of agency is evoked in the community. The melding of cultural/traditional services with Western medicine happens quite seamlessly as both worlds of medicine inform how the staff interact and treat participants in the program.

Culture informs relationships in the ways that healthcare providers interact with patients and the relationships that are fostered. Both patients and health care providers strive to get to know each other better and in doing so, build trust and create a safe environment. A person's experience surrounding diabetes and its care is one that is rooted in community connectedness, family dynamics, community supports and structures. As evidenced in the responses, relationality is a key component of all that Garden River does in its programming. The interaction between staff and participants is one that is long standing, as most staff have been a part of the program for many years. Staff mentioned that they continually find ways to foster healthy relationships with the participants in order to help them feel safe. The majority of the staff members are from Garden River and have known the community for a number of years. The relationships formed outside of the clinic undoubtedly facilitate a strong program. Community initiatives such as the Res Walk, Moccasin Trail, and Community Garden are ways that the community is brought together to reach a common goal of improving health. Family dynamics are stressed as being

highly important as evidenced by the Family Kitchen programs, Make and Take, and Aanjichigewan health promotion, to name a few.

Culture frames knowledge in the ways that health care providers acknowledge the ways the social determinants of health can impact how patients respond and participate in programming; it acknowledges that there are two schools of medicinal thought that can inform the ways people view their health. Garden River's staff have a tremendous understanding of their community and frame the Back to School Blitz around the social and economic stresses that community members may be dealing with. The inclusion of an incentive was described by staff as a key tool that is designed to help families with buying back to school supplies for their children. The staff understand that many in the community are faced with economic restrictions that influence the ways parents take care of their children. By offering an incentive, parents are more prone to taking the time to bring their children to get screened. While some staff had mixed feelings towards the incentive being a motivator, all agreed that it increases attendance and helps families in positive ways. As previously mentioned, Garden River's programming strives to integrate cultural and traditional beliefs and knowledge with Western medicine. Furthermore, education opportunities are constantly provided through programming in an effort to inform parents of knowledge they may not have received when they were growing up due to various constraints (e.g. poor education opportunities). Staff believe strongly in using evidence-based guidelines to inform their policy and procedures, but recognize that their community is one that embraces holistic teachings. Being able to explain the physiology of diabetes to families is something that Garden River strives to do. An example of this was seen by the ways that staff used visual aids to represent sugar and fat content in food during screening opportunities. This shows that

staff understand the importance of explaining the physiology of the manifestations of diabetes, but stays in line with explaining the information in meaningful ways.

One of the major ways Garden River's program incorporates culture and tradition is in the way the program is wholistically centered. One particular component that was recently added is the mental health component. Stress in an Indigenous context can arise from multiple areas of life (social determinants of health) and can accumulate and manifest in the ways that adversely impact the onset of type 2 diabetes (Huffhines et al., 2016). The impacts of residential schools as one staff member discussed on the ways parents feed and care for their children manifest in the stresses that are felt by parents and children alike. These stressors were similarly expressed by Howard (2014) in her study of the effects of residential schools on diabetes by disciplining eating and instilling ideations that traditional foods (corn, beans, squash, berries, turkey, venison and fish) should be replaced by "White" foods (sugars, salt, milk, lard and flour). Furthermore, poverty, often linked with trauma from residential schools, in combination with factors such as overcrowding and food security, can also undermine how children deal with and respond to diabetes. Obesity, as the leading proponent of diabetes, is often linked to stress, depression and poor dietary habits, and can manifest through binge eating (Anderson et al., 2011).

Panagiotopoulos et al. (2018) recommend that children diagnosed with type 2 diabetes be screened for depression and eating disorders at every diabetes-related clinical encounter. The FNIGC (2018) indicates that the third most prevalent chronic health condition among First Nations youth is anxiety. Crowshoe et al., (2018) assert that Indigenous communities should support primary prevention programs for children and adults to assess and mitigate factors associated with psychological stress. Garden River's decision to include a mental health screen as well as hire a mental health youth counselor indicates that they are on the right track by

properly addressing stress as a key determinant and propagator of diabetes in Indigenous communities (Diabetes Canada, 2018). Staff at Garden River expressed the need for having mental health screening as a necessity due to the concerns mounting in the community: “The questionnaire kind of that's where the mental health piece kind of started coming in. Because anxiety was also a big factor. I found in our reserve. The numbers of people with anxiety and depression are a lot bigger than people I think realize. And it even was affecting the kids, right?” (180503-401).

One key idea that was raised by a staff member centered around humour being a cultural way of coping with difficult situations: “Culturally First Nations, people definitely have a big sense of humor. Things that should be serious, aren't always serious because that's just that's just our nature. This is our culture” (180503-401). In times of distress, humour may be responsible for the attitude some parents have towards the risk of being diagnosed with diabetes. Howard (2014) mentioned in her study that humour was cited as a key coping mechanism employed by those who had attended residential schools. This may shed further light on the sentiments shared by that particular staff member, that culturally, dealing with situations is often done using humour.

### 5.3.1 Recommendations

While staff collectively mentioned mental health as being important in addressing diabetes, the actual tool that is used was not made available during the study and cannot be commented on. Garden River and the communities that have yet to include a culturally appropriate mental health screening tool must consider their resources and the time available to administer the questionnaire and decide if there is a better time, perhaps during the year that a mental health screening should be done, or if it should be done as a separate component altogether and the results utilized in a diabetes screening program.

As a way of conveying the seriousness of humour, but that is consistent with the cultural importance of humor, the staff member suggested that flyers and educational materials contain humorous anecdotes or comics that may help people internalize the information better.

#### 5.4 Theme Four and Five: Barriers, Limitations and Facilitators

Throughout the study, staff raised concerns about consistency (attendance, follow-up), negative perception and resources. Staff often shared that because the program is run in the summer, there is a tendency for there to be inconsistent attendance. Children were often sporadically being screened through the bulk of the summer, but towards the end would come in droves. Due to this occurrence, staff often felt overwhelmed and found that it was hard to balance their usual daily activities with carrying out the screening program. Staff also commented that there were inconsistencies in the filling out of the forms at times, due in part to the rushed nature of the number of students to screen. They also commented that there is sometimes a long turn-around time for participants to be brought into follow-up programming. In addition to this, staff felt that there needed to be more opportunities for children to attend follow-up programming, which may be due to a lack of human resources and funding. Interestingly, funding did not present itself to be a major theme, although each community should evaluate and create a budget for the services they want.

The negative perception felt by some of the female children and youth was cited by staff members as something that occurred more frequently than they would like. Students often felt uncomfortable being weighed and a negative body image was often expressed. One staff member felt that BMI was not a good predictor of a potential diabetes diagnosis and wished to see it removed. The other staff members acknowledged that the concerns were real and expressed that

they did their utmost to make the children and youth feel comfortable. Students could refuse to have their measurements taken if they wished. If a student felt uncomfortable having their family around, they would be taken to a room by themselves to have the measurements done. Using BMI as a measurement is sometimes categorized as problematic, as it does not take into consideration fat distribution or muscle mass, in addition to this, children labeled as “fat” or “obese” may develop self-esteem issues and body dissatisfaction, not to mention eating disorders (Ikeda et al., 2006). In spite of these concerns, Panagiotopolous et al. (2018) have BMI greater than or equal to the 95<sup>th</sup> percentile as being a primary risk factor for the development of diabetes. Furthermore, anthropomorphic data has been shown to positively predict the onset of gestational diabetes mellitus in Indigenous women (BMI, weight, waist circumference, waist to height ratio). BMI and waist to height ratio were best predictors. (Sina et al., 2015).

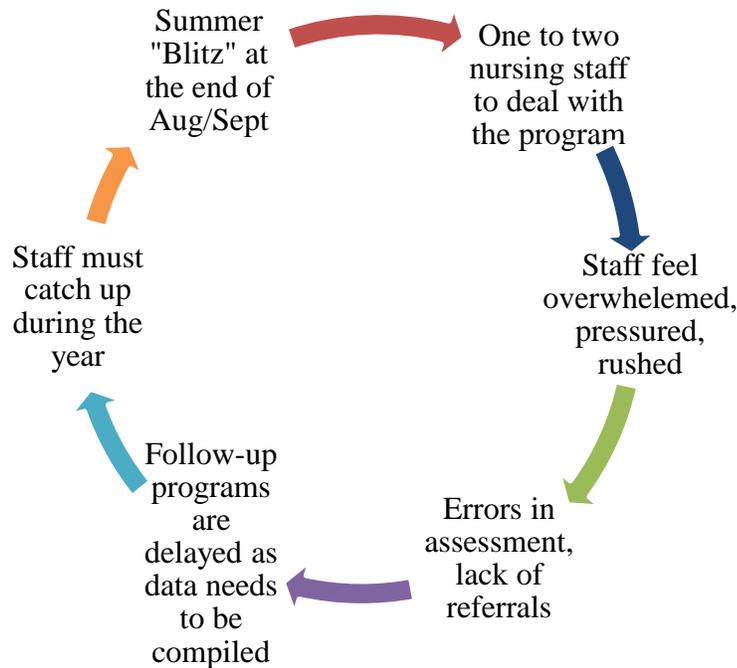
Lastly, the resource that staff felt was most lacking was more time. To understand the sentiments that staff felt, it is necessary to approach it from different areas. Firstly, staff indicated that the nature of the program is such that it is hard to predict when the students will be making their appointments. This is due mainly to the fact that the program is carried out over the summer break and families are often away, not to mention staff also take their vacation. By the time August is over, families know they must rush to get their child in if they are to A) get their child screened and B) receive the incentive. Because of this, many students may be booked in a short amount of time. The program is set up so that there are typically two nurses that are in charge of it. When looking at the responsibilities of assembling questionnaire packages, screening children, filling out the screening sheet with referrals, ensuring everything is done accurately, conversing with parents and carrying out normal every day duties, it is no wonder staff feel overwhelmed at times. While staff indicated that they felt they could use more hands, the general sentiment was

that they managed. One staff member even commented that the resources are available for parents to bring their child in at any point of the year, and that a program like this, while beneficial, should not be the only reason parents bring their child out.

The follow-up programming for the children who screened high for a risk of diabetes and obesity is typically carried out by staff from the North Shore Tribal Council, with all of the referrals going to the dietician. Staff felt that there is sometimes a disconnect between the two organizations due in part to the different EMR systems used (Mustimhw and Nightingale on Demand). In addition to this, the referral sheet does not include the Community Health Promoter, who is typically responsible for facilitating the follow-up programming along with the dietician and a nurse practitioner or diabetes nurse educator.

#### 5.4.1 Recommendations:

It appears the nature of the program, as one that sees a high volume of children at the end of the summer, is something that cannot be easily avoided. What appears to be the issue is that attendance is overwhelming, there are typically only two staff members to deal with the program, staff sometimes feel overwhelmed and pressured, assessment forms sometimes may not be filled correctly, referrals may not be done on the sheets, as that takes time to talk with the students and their families, and follow-up programs are sometimes not carried out in a timely manner. These events can be cyclical and can compound on each other, magnifying barriers and limitations (See figure 4 below).



**Figure 4** Flow chart connecting some of the compounding and cyclical barriers and limitations to the program, as addressed by staff members

The general consensus is that the program can use more hands to assist. It was mentioned during the conversations that there is funding that can be pulled to hire a staff member. Therefore, based on the feedback from staff members and due to the growing nature of the program, it is highly recommended that a staff member be hired specifically to deal with this program and to take the reins on it. The program, especially during the end of August and beginning of September, requires full-time dedication to ensure everything is run smoothly. Staff felt that having to tend to regular daily duties in addition to the rigour of the program was overwhelming. According to feedback from the staff, this person should be an RPN at minimal, to ensure that the assessments are done correctly, referrals are filled out correctly, and any health questions that are raised can be addressed. This person's sole focus should be on the summer program, getting the resources, compiling packages, aiding in the assessments, ensuring quality control on the forms as well as compiling and adding the data to previous years, to be analyzed at an appropriate time. The

program has been steadily expanding over the years to include a number of questionnaires to be filled out by parents and children regarding physical activity, lifestyle and nutrition, and a mental health screen; however, the number of staff running the program has remained the same. Once the program is complete all that data must be compiled, and with the exception of a few years that had nursing students help out, all that must be done by the nursing staff in addition to seeing patients daily, which leads to a delay in follow-up. One key area that staff addressed was the disconnect between the staff at the North Shore Tribal Council and Garden River. Due to the different EMR systems an individual is needed to act as a liaison, ensuring follow-ups are being done in a timely manner, as well as coordinating with the program staff to find the appropriate spaces and times where programs can be run. Having this extra person would free up the other nursing staff, to tend to their daily routines as well as still be actively involved. Garden River also produces monthly calendars with activities for children and youth that are wholistically focused and could be incorporated during the referral process in the assessment stage. Having a person who is able to know the programs in the community and recommend pertinent ones to children and their families, as well as answer questions, should increase the efficacy of the program.

Staff mentioned that space was an issue, with room size and lack of facility space being cited as the culprits. It is recommended that sufficient space be allocated so that the screening process can be as effective as possible. Staff mentioned they would like to have visual aids set up for the children, but were not able to do it in recent years due to space issues.

Staff mentioned that there was no formal follow-up with the children after the screening and programming was done. If staff wish to formally evaluate the knowledge of the participants, they may wish to explore the *Knowledge, Self-Efficacy, and Intentions Questionnaire* (KSIQ), which

was formally utilized in a study by De Bourdeaudhuij et al. (2005). This questionnaire was then refined by Gates et al. (2013) for a study in an Indigenous community in Fort Albany, Ontario, Canada. The original questionnaire seeks to ask children ages 10-11 questions based on 15 constructs that were analogous for fruit and vegetable intake, self-rated intake, knowledge, attitudes, liking, subjective norm, active parental encouragement, general self-efficacy, intention, habit, preferences, family rules, availability at home, availability away from home, and perceived barriers. De Bourdeaudhuij and colleagues determined that the questionnaire provided a valid tool for assessing personal, social and environmental parameters surrounding fruit and vegetable intake in 10-11-year-olds. It was also found to be a valid tool for evaluating nutrition education programs geared towards children of this age group. The implementation of this questionnaire for the particular contexts surrounding Garden River is beyond the scope of this paper, but merits investigation with researchers well versed in qualitative study designs.

It is recommended that Garden River First Nation perform statistical analysis on the screening data that has been collected since the program started, which is just over 10 years worth of data. By doing this, Garden River may be able to generate a longitudinal study that compares the various years of data, since many students repeat the screening process each year. This will enable the community to gain a better understanding of the problematic areas that repeat each year and may also help solidify the responses in this study. Variables to be assessed can be peak attendance, number of referrals made, follow-up programs attended and others that are pertinent.

A concept that might be of interest to incorporate in the follow-up programming could be the implementation of a peer-mentorship program, similar to that in the study conducted by Ronsley et al. (2013), that demonstrated that pairing young and older children increased healthy food and living knowledge as well as higher self-esteem scores. The study also demonstrated marginal

decreases in zBMI scores between the control and the intervention group. Incorporating peer leadership in some sense can therefore be a potentially viable way to increase attendance and participation in the program.

#### 5.4.2 Facilitators

Much of what makes Garden River's program so effective is the staff themselves. There is a tremendous amount of care and dedication exuded by this group of people. The staff thoroughly enjoy being involved with the program and interacting with the children and their families. Consistency and positive perceptions were found to be strong facilitators to the program in the way that the staff have been a part of the program for so long, with many of them from the community. Staff were able to make children feel comfortable and engaged with them in ways that fostered meaningful relationships at the individual, family and community levels (Crowshoe et al., 2018). The relational aspect, as mentioned before, is highly valued in Indigenous cultures and is evident in the way this program is run. Resources and programs are also holistically based and community focused. Everything that is done or has been added is for the benefit of the community, and encourages traditional activities, practices and beliefs (Crowshoe et al., 2018; Protudjer et al., 2014). The incentive, once again, is a tool that has proved to be highly valuable in encouraging participation in the program. In addition to this, visual aids as well were described as a necessary and important tool in educating children on the dangers of excess sugar and fat consumption.

Garden River First Nation collects a wide variety of data and, based on conversations, it appears that the data collected through various screening and questionnaire tools, although they may be considered tedious, aids in funding proposals as the necessary information is available. This has been observed in recent funding that has been granted to implement *Jordan's Principle*, an

initiative to aid children with mental health and developmental concerns. This may strengthen their case to gather as much information as possible, when possible.

## Chapter 6: Conclusion

Garden River First Nation is a community that strives to implement programming that improves the health and well-being of its population as a whole. Of particular importance is the health and well-being of the children and youth of Garden River, as that population is one that is not only increasing in number, but in health risks as well. Garden River understands that targeting this population and implementing culturally appropriate screening and prevention programming is essential to minimizing the onset of diabetes at a later point in time. Indigenous communities face barriers atypical of those of the general Canadian population. Social determinants of health (Indigenous ancestry, income, food security, education, access to resources and environments) are some of the factors that influence the health and well-being of this population. Utilizing a socioecological approach (Willows et al., 2012), the broad social and political implications of colonization, Westernization and Residential schools surround and influence these determinants, family dynamics, health behaviours and ultimately the prevalence of diseases such as obesity and diabetes. Garden River acknowledges that the impacts of colonization and, more recently, residential schools have negatively impacted their community. Respondents indicated that parents and grandparents who have experienced this environment can have a hard time instilling positive, healthy behaviours. Embedded in this model are social determinants of health and, more specifically, food and income security. In this community, healthy food options are often limited by income and accessibility. Garden River has decided to address some of these issues mainly through the use of incentive programs that are either monetary or cost reducing/eliminating.

Community and relationships are a large part of this model, as each level is connected. This community understands that relationships are of utmost importance and the program reflects interconnectedness on the individual, familial and community levels.

A life course perspective (Ben-Shlomo & Kuh., 2002; Darton-Hill et al., 2004; Elder, 1997; Elder, 1985; Elder et al., 2003; Elder and Shanahan, 2006; Elder et al., 2015; Hertzman & Boyce, 2010; Hertzman & Power, 2006;), taken in conjunction with the socioecological model, explains that the events that occur throughout the life span have the potential to compound and influence outcomes at later stages. The first principle indicates that health is constantly changing across the lifespan. Garden River's choice to direct this program to children and youth is a strong indication that they understand that the choices and events that take place at any stage can have an impact on health outcomes in the future. Garden River desires that diabetes not simply be a managed disease in the community, but that it be eradicated. By acknowledging that this must begin with the youngest generations, Garden River is on the right track. This principle ties in with the second, that indicates that pathways and trajectories occur throughout the lifespan.

Garden River's mandate to address nutrition and healthy living in young and soon-to-be young mothers, the screening assessments for children and youth, and their preventative programming, address the latent, pathway and cumulative events that make up a person's trajectory. Helping to foster healthy gestational environments in the latent stage can reduce the onset of diabetes, and Garden River tries to do just that through programming like the Aanjichigewan Healthy Lifestyle program and others. Pathway events such as routine diabetes screening have shown to be essential in keeping track of children and youth who are at risk for developing diabetes, and who otherwise may have otherwise not been identified, leading to a diagnosis of diabetes in the later stages of life. The many types of preventative programs that instill positive self-image, healthy

behaviours and teach essential skills have the ability to compound and deter a diagnosis of diabetes in the lives of these children many years down the road. The third principle outlines the historical and social contexts that surround individuals. The historical underpinnings of colonization and residential schools are evident in the community and are observed in various ways. Garden River understands that there are deep rooted issues that need to be addressed, and as such they make every effort to support the families there. Within these contexts, individuals have the ability to cause positive or negative changes in their lives. As a community, this principle of agency is afforded to all families through the use of incentives and free programming. Within the programming, families are offered traditional services, Western services, or a blend of both. Families are never forced to pick one over the other and are never judged for their choices. Lastly, the principle of linked lives is highly evident in the community and program structure. All the programming is centered on relationships, be it within the family, between health care providers and participants, or within the community as a whole. Lives are strongly linked and that is reflected in the way that Garden River wishes to address the concerns of diabetes.

I believe that Garden River's Back to School Blitz program is one that understands the importance of reaching children and youth as early as possible and setting them on a path towards wholistic health while being heavily intertwined within the social, economic, and political constraints that influence every facet of their lives. This program utilizes community-based participatory engagement, and through their screening and follow-up programming can mitigate the burdens associated with diabetes through early detection and provide alternatives to conventional health care (Ralph-Campbell et al., 2011). This program is run by staff who are dedicated to their community and who understand there are a number of obstacles that must be

dealt with when it comes to reducing diabetes in its population. Waiting and treating diabetes when it is formally diagnosed is not an option and, as such, instilling healthy lifestyle and nutritional behaviours in conjunction with annual screening for evidence-based risk factors for children and youth as young as possible is of utmost importance. By providing an incentive to families to come and be screened, Garden River is helping families who are in financial need purchase supplies necessary for their children, and in the process facilitates healthy screening and programming that families otherwise may not be able to take advantage of.

The methodological frameworks used (Indigenous wholistic theory/paradigm, Community-Based Participatory Action Research and the Medicine Wheel) were designed to account for the views that are held and valued by the community in order to conduct research in a respectful partnership. Within these frameworks, a wholistic view of health was emphasized, and through this research, it was observed that the programming does in fact maintain that health is wholistic. The medicine wheel was incorporated in the question design and in the way the responses were understood. It was the goal of this research to ensure everything about *ontology*, *epistemology*, *axiology* and *methodology* reflected an approach that was consistent with the TCPS 2 and OCAP recommendations for research with Indigenous communities. Community-Based Participatory Action Research was a major component of the study and was reflected in the way the project was designed and carried out. Recommendations generated by myself are to aid the community in their future endeavours and contribute to the *action* component.

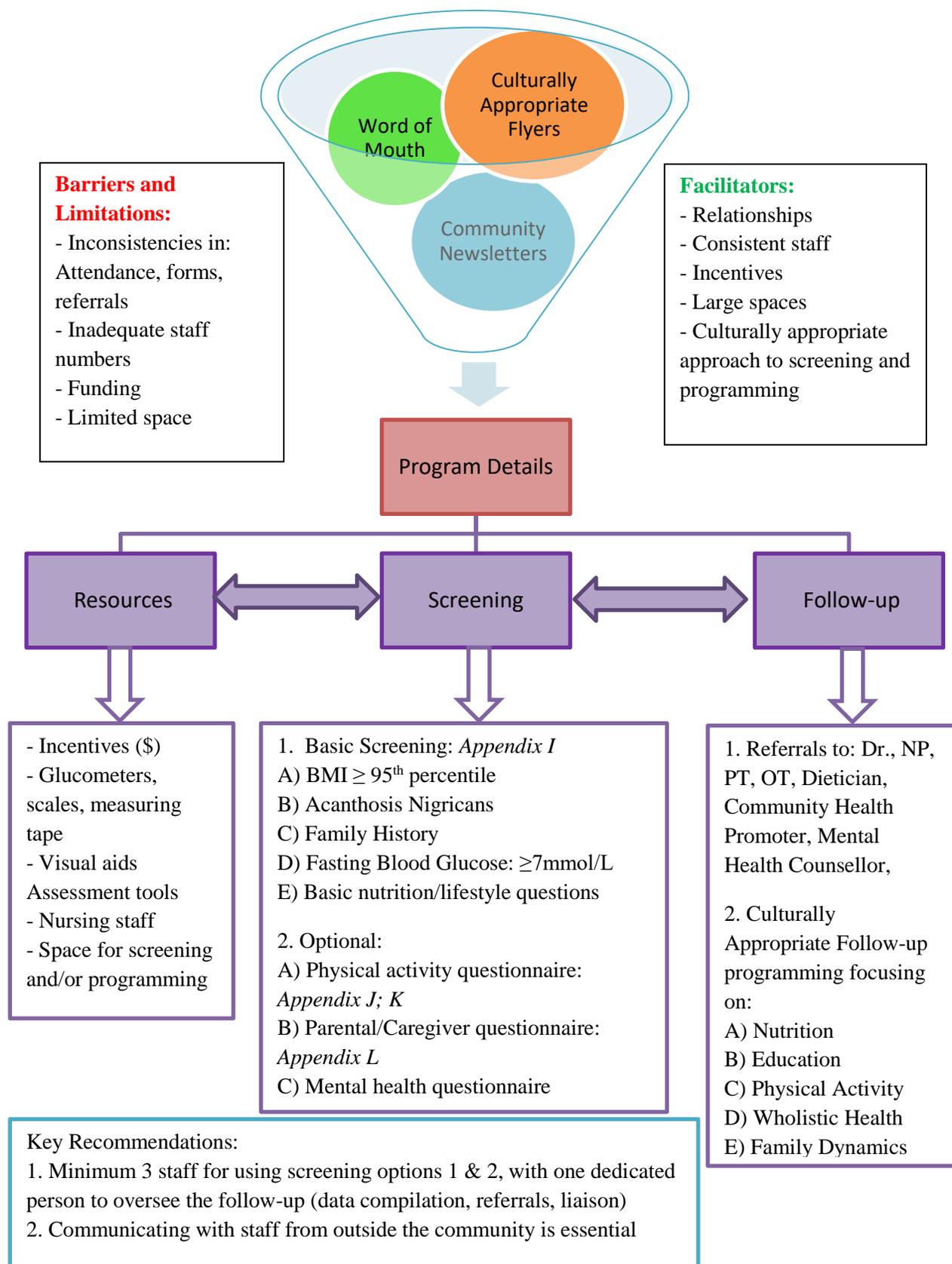
## 6.1 Implications

This document can be used by Garden River and policy makers to evaluate the processes carried out thus far, and to decide if any changes need to be made to ensure that the program continues

to grow and be impactful. Qualitative feedback from staff directly involved with the design and implementation of the program can provide a key perspective on areas of strength and weakness. This document will allow the voices of those who have implemented a program from the ground up and have sustained it for over 11 years to be heard. This study demonstrates that it is possible for a community to implement an evidence-based program to screen and aid in the prevention of obesity and diabetes in their children and youth.

Through this study, it has become evident that this program is highly viable in Indigenous communities wishing to implement a screening program for their children and youth. The follow-up programming is also something that is highly viable but will take efforts in securing funding and the human resources necessary to run them. Depending on the goals of the screening program, a community can do very basic screening based on the assessment form, which will provide key insight into whether or not a child is at risk for diabetes based on the Diabetes Canada (2018) guidelines for screening Indigenous children and youth. The additional questionnaires Garden River has implemented (*physical activity, mental health, lifestyle and nutrition*) provide further detailed insights into the lives of the children and can aid a community in deciding what programming would best suit the child or youth. It is evident from the responses in this study that these additional tools are beneficial; however, may contribute to errors in the forms and to staff feeling overwhelmed. If a community wishes to follow the screening and follow-up programs set forth by Garden River, they should endeavour to ensure that there is an adequate number of staff to run the program smoothly, with someone who can take leadership and ensure all parts of the program (screening and follow-up) are being dealt with by the various staff that may or may not be from the community. A process model was generated using the most pertinent data from the study and can be found in Figure 5. This

process model can serve as a reference guide and visualization for some necessary components for an obesity and diabetes program as observed in Garden River First Nation.



**Figure 5** Process model highlighting key components of the Back to School Blitz

### 6.1.1 Limitations and Considerations

While the feedback on this program indicates the program is highly successful, this still remains a case study and the biggest limitation is found in the transferability to other communities.

Garden River has spent a considerable amount of time researching, consulting and planning ways to make this program the way it is. Communities looking to implement a program such as this will need to evaluate their resources, and budget for what they feel is most important to them.

While this study focused mainly on the daily operations of the program, the planning process undoubtedly took a significant amount of time. In addition to this, one staff member mentioned that Garden River is a proactive community, and so they keep detailed records to be used to apply for funding opportunities. While this is beyond the scope of this paper, communities wishing to apply for funding to incorporate programs such as this must ensure they have the proper documentation to satisfy provincial and federal requirements.

Due to the qualitative nature of this study, there is no quantitative data to further substantiate the efficacy of the program in question. Nevertheless, the program adheres to screening and prevention guidelines outlined in the Diabetes Canada (2018) recommendations for children and youth and Indigenous populations. Compiling and assessing anthropomorphic data in conjunction with the questionnaire and screening form feedback can help provide more empirical merit to the program (Gates et al., 2013; Ronsley et al., 2013; Tomlin et al., 2011).

Due to various extraneous circumstances, I was not able to visit the site prior to formal data collection. In order to follow the principles of a conversational approach (Kovach, 2010), sufficient time must be spent with the intended respondents in order to build a strong relationship that will help provide rich feedback. Nevertheless, I believe the connections made between my

supervisory committee and the staff at Garden River over the years bridged those gaps and allowed for meaningful feedback. It is important for communities to be comfortable with researchers and, as such, researchers should endeavour to spend as much time as possible with the community prior to any formal data collection.

## 6.2 Closing Remarks

This research project has enabled me to delve deeper into the realm of health disparities that Indigenous communities face. Going into this project I was aware of the many obstacles communities face, but I was not aware of the ways communities were combatting them. Diabetes is a disease that has taken root in many communities and has had devastating effects. Through this project, I have learned that communities such as Garden River have made it their mission to fight back against this disease by ensuring that future generations are adequately screened for health risks and provided opportunities to learn and develop healthy behaviours that can significantly reduce obesity and the diagnosis of diabetes in their adult lives. This program is an incredible example of a self-started initiative that has been making differences in the lives of the children in the community. It is my wish that this research will aid communities in incorporating a screening and prevention program of their own. I commend Garden River First Nation for their hard work and dedication, and I thank them sincerely for allowing me to partner with them.

## Appendix A

1. Peer Mentoring for Type 2 Diabetes Prevention in First Nations Children (Eskicioglu et al., 2013)
2. The Aboriginal Youth Mentorship Program (AYMP): A Peer-led healthy living after-school program for achieving healthy weights in First Nations children (Eskicioglu et al., 2014)

**Objective:** To assess the efficacy of an after-school, peer-mentorship program in partnership with a remote First Nation community in northern Manitoba. Community-based participatory action experimental trial was used to test whether the peer-led mentoring program would attenuate weight gain (reduction in BMI) as well as increase knowledge and healthy behaviours in primary school children. Changes in adiposity were also hypothesized to correlate positively with improvements in healthy living knowledge and behaviours and self-efficacy.

**Methods:** A 5 month long culturally appropriate quasi-experimental trial with a parallel non-equivalent control arm was carried out with 151 children in Garden Hill First Nation during 2010-2011 and 2011-2012 during the school year. Children were in grades 4 and 5, with participants being from grade 4 and control group being made up of grade 4/5 students. Intervention consisted of a 90-minute peer led after-school program (Aboriginal Youth Mentorship Program or AYMP) once a week to grade 4 students. The program was built on cultural teachings, “Circle of Courage” and “Four R’s model” designed to build on the strengths of Indigenous youth as mentors (grades 7 to grade 12). These teachings coincided with key areas of well-being (healthy food, healthy play, education and healthy relationships). The program sought to include peer teaching of low-organized games and activities, knowledge sharing about healthy foods, and peer teaching of education games and activities with 45-minute supervised moderate to vigorous physical activity.

**Results:** 151 children successfully participated in the trial (51 intervention vs 100 control). Baseline measurements of waist circumference was noted between the intervention and control group (79.8cm vs 83.9cm), BMI z score (1.46 vs 1.48) and overweight/obesity (75% vs 72%). The change in waist circumference was significantly lower with the adjusted treatment at -2.5 cm [95% confidence interval (CI): -4.1 to -.90; P=0.002] and BMI z scores were significantly lower in the intervention versus control group -0.09 [95% CI: -0.16 to -0.03; P = 0.007]. Students also exhibited increased knowledge of healthy dietary choices and self-efficacy associated with changes in waist circumference.

**Discussion:** This intervention was unique as it expanded on previous study designs conducted in Indigenous communities by: adding a control arm from the same demographic as the intervention group, was delivered in a remote community with a high onset of type 2 diabetes, as well as showed that self-efficacy can be improved through community driven, school-based

healthy living interventions. This study demonstrates that peer-led, culturally appropriate interventions are feasible and elicit positive responses. Increased self-efficacy is associated with behaviour change and changes in physical activity levels.

**Limitations:** Selection bias due to quasi-experimental nature. In order to minimize bias, the control arm was selected to match baseline weight, body fat distribution and sociodemographic levels as closely as possible. Different ratios between females and males (3:1 intervention and 1:1 control). Control groups were not fully blinded to investigators, as grade 5 students were known to be control participants. Carry over effect from students in the first intervention and moved to control for the second group could have had an effect on the results, although they were removed in an analysis and found that no significant change was noticed. The measurements used to account for healthy food knowledge were described as “crude” by investigators compared to the gold standard 3-day food records. Parental involvement was minimal, as there was no curriculum or formalized way for parents to participate, which may have limited the effectiveness of the study.

3. A Pilot Comprehensive School Nutrition Program Improves Knowledge and Intentions for Intake of Milk and Milk Alternatives Among Youth in a Remote First Nation (Gates et al. 2013)

**Objective:** The study sought to increase the consumption of milk and milk alternatives among Cree children in grade six living on reserve in Fort Albany, Ontario in a pilot comprehensive school nutrition program from 2009-2010. The study sought to use the principles of Social Cognitive Theory (SCT) to facilitate behaviour change.

**Methods:** The principles of SCT along with policy, education, food provision, family and community involvement and program evaluation. Food policy and sample shopping lists were provided and nutrition education based on the *Power4Bones* education program by the Dairy Farmers of Canada. Each grade received 1 30-minute class every week for 5 weeks with information handouts given to parents. Healthy breakfast options were provided consisting of fruit, whole grains, protein and milk and milk alternatives. Students were assessed pre/post-trial on their knowledge, self-efficacy and intentions.

**Results:** Students were assessed using the Knowledge, Self-Efficacy, and Intentions Questionnaire (KSIQ), which although has not been formally validated in First Nations children, it underwent formative evaluation with community members and was deemed culturally appropriate. The WEB-Q was a questionnaire validated for use with First Nations children to assess their eating behaviours and was deemed culturally appropriate. In both of these tests, students were shown to have increased improvement in knowledge about milk and milk alternative, and intentions to consume in the future.

**Discussion:** Shortness of program as well as poor attendance were cited as reasons for poor

quality of outcomes. While students showed an increase in knowledge and intention, sustainable behaviour can be affected by environmental barriers that exist and impede the acquisition of milk and milk alternatives. Limitations to programs like these exist at the community level, where there is little to no follow through by leadership and policy.

**Limitations:** The KSIQ has not been formally validated for the population being studied, although it presented as culturally appropriate. The small population size with a high degree of diversity in resources and cultural differences precluded other schools from being reliable controls. The study design utilizing 24-hour recall could have diminished the quality of responses in terms of underreporting, memory and other biases.

4. Assessing the Impact of Pilot School Snack Programs on Milk and Alternatives Intake in 2 Remote First Nation Communities in Northern Ontario, Canada (Gates et al., 2011)

**Objective:** As evidenced in epidemiological trials, calcium intake has been shown to be inversely related to body weight. In order to help combat food insecurity as well as poor nutrition (calcium and vitamin D deficiency), a snack program was introduced in two remote First Nation communities (Kashechewan FN and Attawapiskat FN) to youth in grades 6 to 8.

**Methods:** Study took place in 2009. Students were administered a WEB-Q (similar to the one used in example 3) in order to test baseline levels. Coordinators received training and grant writing support. Changes in dietary intake were assessed after 24-hour recalls, pre- and 1-week post program with a 1 year follow up in Kashechewan. Student impressions were collected after 1 week using open-ended questions and teachers' and administrators' impressions were collected via focus groups after 1 year in Kashechewan.

**Results:** At baseline, overweight and obesity rates vastly exceeded the general Canadian population with majority of participants not meeting the required intake for milk and milk alternatives with over 80% of participants having calcium and vitamin D levels below adequate intake. After 1 week, calcium intake increased in Kashechewan ( $805.9 \pm 552.0$  to  $1027.6 \pm 603.7$  mg,  $p = .044$ ), but these improvements were not sustained after 1 year. In Attawapiskat, vitamin D levels increased from ( $2.5 \pm 2.6$  to  $3.5 \pm 3.4$   $\mu\text{g}$ ,  $p = .022$ ) with milk and milk alternatives ( $1.7 \pm 1.7$  servings to  $2.1 \pm 1.4$  servings,  $p = .034$ ), with no 1 year follow up. Both students and teachers felt the program was a positive experience and enabled students to make better food choices. Some students did not enjoy trying snacks like UHT milk. In addition to this, a lack of fridge space prevented the storage of milk products.

**Discussion:** While many believed the program to be a much-needed addition, barriers such as funding and availability of food prevented it from being implemented permanently. Having a snack program facilitated many students receiving adequate nutrition, where they would have usually not received it (skipping meals, not able to purchase required food). Barriers included personnel shortages, lack of storage space, high food prices, environmental constraints and

limited budget. This is an issue that requires global change on a governmental level to ensure that communities such as this are receiving the resources necessary to mitigate obesity.

**Limitations:** Data collected after 1-week trial only with a follow up after 1 year. Sample size was sub-optimal and there was no control group.

5. Healthy Buddies Reduces Body Mass Index, Z-Score and Waist Circumference in Aboriginal Children Living in Remote Coastal Communities (Ronsley et al., 2013)

**Objective:** Health promotion and education programs are shown to be most effective when introduced at a young age, and with the participation of whole schools/communities. The objective of this study was to assess whether or not a peer mentorship program would facilitate children's improved body mass index, waist circumference, blood pressure, as well as, improvements on healthy eating, health knowledge and self-esteem.

**Methods:** Out of 14 bands in a remote fly/boat-in community located in British Columbia, three schools participated (2 in the intervention and one as the control). The program was a whole school model based on the BC Ministry of Education and included 21 lessons and 6 fitness loops, each of which was 30 minutes. Teachers would instruct older students, who would in turn instruct their "buddies". The fitness loops consisted of fun exercises designed for children of all physical capabilities. The program included children from grades K-12 and ran for over 10 months during the 2009-2010 school year.

**Results:** The program was able to achieve significant reductions in zBMI (1.10 to 1.04,  $p=.028$ ) and WC (77.1 to 75.0 cm,  $p<.0001$ ) in the HB group (N=118) compared with an increase in zBMI (1.14 to 1.23,  $p=.046$ ) and a minimal WC change in the control group (N=61). Elevated blood pressure levels did not change in the intervention group but showed an increase from 16.7% to 31.7% in the control group. Significant interaction with time and group were nutritious beverage knowledge, healthy-living knowledge, and self-esteem scores.

**Discussion:** This program was able to achieve lower zBMI and WC in children and contrasts the results of the Kahnawake program that employed a similar whole-school model which focused on cognitive knowledge development and healthy lifestyle promotion. Decreases in the above scores along with adiposity have been shown to correlate with the reversal of glucose intolerance. A key feature of this program is the peer mentorship aspect, that many found to be "fun" and allows for healthy interactions and positive reinforcement from peers. This program did not require additional staff (a limitation noted by other studies) and was incorporated as part of the regular curriculum, as opposed to an afterschool program that may add strain to teachers.

**Limitations:** Study was not a randomized control trial, and affordability of resources was not taken into consideration.

6. The impact of Action School! BC on the health of Aboriginal children and youth living in rural and remote communities in British Columbia (Tomlin et al., 2011).

**Objective:** The school environment has been shown to be a positive location for increasing healthy eating and physical activity, due to the amount of time children spend there per day. The study sought to evaluate the efficacy of the Action Schools! BC (AS!BC) program in the context of rural, remote Indigenous communities. The study wanted to measure obesity-related body composition, physical activity levels, aerobic fitness, cardiovascular risk and healthy eating for First Nations children and youth living in 3 remote locations, using a 7-month long intervention.

**Methods:** Part of a larger community based participatory action research project and researchers were invited to participate. 170 students from grades 4-12 were invited to participate from the 3 communities with 148 at baseline and 134 at follow-up. AS!BC is a whole-school program that believes children should accrue 150 minutes of physical activity per week during school hours as well as regular physical education classes (75-80min). In addition to this, health education should also be taught. Teachers tailored additional 15-minute activities for their classes each day. The program also sought to incorporate environmental change (playground equipment, family and friend events). Variables measured: zBMI (Body Mass Index), zWC (Waist Circumference), aerobic fitness (20-m shuttle run), PA (Physical Activity; questionnaire and accelerometer), healthy eating (dietary recall) and cardiovascular risk (CV risk).

**Results:** At baseline 51% of participants were overweight or obese. zBMI remained unchanged, but zWC increased from 0.46 +/- 1.07 to 0.57 +/-1.04 ( $p<0.05$ ). No change was detected in PA or CV risk, but aerobic fitness increased by 22% (25.4 +/- 15.8 to 30.9 +/- 20.0 laps;  $p<0.01$ ). Vegetables consumed increased from 1.10 +/- 1.18 to 1.45 +/-1.24;  $p<0.05$ ) with no change noted in caloric intake.

**Discussion:** This study was an extension of the previous work of a study over 1 school year, which significantly increased the aerobic fitness of mixed-ethnicity children in urban schools. Main takeaway was that increases in aerobic fitness (22% according to the study) can indirectly be representative of the findings that a 1 metabolic equivalent (MET) increase in aerobic fitness decreases the risk of all-cause mortality by 15%. The improvement of physical activity in First Nations children represents strong progress towards decreasing obesity-related chronic disease (type 2 diabetes). A 0 change in zBMI can be considered positive, considering zBMI has increased in other First Nations interventions for children (Kahnawake diabetes prevention). Strengths of the study include the idea that this project was naturally integrated into everyday lives of students, and a high degree of participation indicates a willingness to adopt the program.

**Limitations:** Lack of control group, self-reported PA and healthy eating levels were inconsistent, accelerometry protocol was not met, dietary recalls may have not accounted for usual food consumption patterns, short intervention time of 7 months is not ideal.

Appendix B

**GARDEN RIVER**



**FIRST NATION**

PHONE (705) 946-5710  
FAX (705) 946-5702

**NAAN-DOO-WE'AN  
WELLNESS CENTRE**  
23 SHINGWAUK STREET  
GARDEN RIVER, ONTARIO  
P6A 7B2

January 24, 2018

Laurentian Ethical Review Board  
Laurentian University  
935 Ramsey Lake Road  
Sudbury, Ontario

Dear Laurentian Ethical Review Board;

The Health and Wellness Centre with the support of the Chief and Council of Garden River First Nation recognize that childhood obesogenic diseases, such as diabetes, are a major concern for First Nations children. The rates of obesity according to the First Nations Regional Longitudinal Health Survey estimates that obesity rates among youth ages 12-17 to be 14.1%, 26.4% for children 11 years and under and 48.7% in children ages 3-5.

The Chief and Council in partnership with Andrew Niles, a Masters Candidate at Laurentian University, will undertake a project to examine Garden River's obesity prevention initiatives, in order to develop a process model that can be used to determine best practices. The research project will provide a template that can be used by other First Nations communities, and provide a key perspective of the individuals instrumental in designing, implementing and maintaining a self-directed obesity prevention initiative.

This research project in partnership with Andrew Niles is therefore supported by Garden River First Nation.

Yours truly,

Pamela Nolan,  
Manager, Health & Social Services

Copied to: Chief and Council, Garden River First Nation

**OJIBWAYS OF ROBINSON-HURON TREATY OF 1850**

**APPROVAL FOR CONDUCTING RESEARCH INVOLVING HUMAN SUBJECTS**

Research Ethics Board – Laurentian University

This letter confirms that the research project identified below has successfully passed the ethics review by the Laurentian University Research Ethics Board (REB). Your ethics approval date, other milestone dates, and any special conditions for your project are indicated below.

TYPE OF APPROVAL /	New <b>X</b> /	Modifications to project /	Time extension
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<b>Name of Principal Investigator and school/department</b>	Andrew Niles (PI), Interdisciplinary Health; Darrel Manitowabi, Northern and Community Studies and Sheldon Tobe, NOSM (Co-Supervisors); Jeffrey Wood, School of Education (Mentor)
<b>Title of Project</b>	Using provider perspectives to understand what makes obesity and diabetes prevention programs for children living in a First Nation community in northern Ontario effective
<b>REB file number</b>	6013710
<b>Date of original approval of project</b>	April 13, 2018
<b>Date of approval of project modifications or extension (if applicable)</b>	
<b>Final/Interim report due on: (You may request an extension)</b>	April 13, 2019
<b>Conditions placed on project</b>	

During the course of your research, no deviations from, or changes to, the protocol, recruitment or consent forms may be initiated without prior written approval from the REB. If you wish to modify your research project, please refer to the Research Ethics website to complete the appropriate REB form.

All projects must submit a report to REB at least once per year. If involvement with human participants continues for longer than one year (e.g. you have not completed the objectives of the study and have not yet terminated contact with the participants, except for feedback of final results to participants), you must request an extension using the appropriate LU REB form. In all cases, please ensure that your research complies with Tri-Council Policy Statement (TCPS). Also please quote your REB file number on all future correspondence with the REB office.

Congratulations and best wishes in conducting your research.



Susan Boyko, PhD, Vice Chair, *Laurentian University Research Ethics Board*

Letter of Information and Consent for Key Informant Interviewees

Project Title: Using provider perspectives to understand what makes obesity prevention programs for children living in a First Nations community in northern Ontario effective

**Principle Investigator**

Andrew Niles, BSc  
Master of Science (Candidate)  
Interdisciplinary Health  
School of Rural and Northern Health  
aniles@laurentian.ca

**Co-Supervisor**

Darrel Manitowabi, PhD, MA  
Associate Professor  
Northern and Community Studies  
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**Co-Supervisor**

Sheldon Tobe, MD, MSc, FRCPC, FACP, FASH  
Chair in Aboriginal and Rural Health Research  
Associate Scientist  
Northern Ontario School of Medicine/ Heart and Stroke Foundation  
Sheldon.Tobe@Sunnybrook.ca

**Purpose of Research**

A research project will be taking place to examine the successes and challenges experienced by those involved in creating, delivering and maintaining the childhood obesity prevention programs. I (the principal investigator) want to talk to individuals who will be able to inform me of what they liked and what they did not like about the programs, what worked really well, and what needs improvement. My intention is to create a template that other First Nations can follow, in order to help reduce obesity and its related diseases. I would also like to be able improve the current programs, if necessary.

**What will happen during the study**

You will be asked about your involvement in the obesity prevention program. We will have a conversation based on your involvement to find out what are some challenges and successes that you have experienced through your time with the obesity prevention programs. I will ask you to provide personal insights that will be used to shape the program going further, and to help other First Nations develop programs of their own. With your permission, our conversations will be recorded by an audio device and then transcribed. Should you refuse to have our conversation audiotaped, our conversation will be typed word for word at the time of the interview. The results will be shared with the community as well as academics and researchers in the form of a thesis and poster presentation. I will aim to have the conversation go no longer than 1 hour.

**Expectations for participants**

You as the participant, have the right to refuse to participate in the study. Even after agreeing to be part of the study, you may back out at any time, at which time any responses you have given will be destroyed. Your identity will remain anonymous and personal identifiers known only to the principal investigator will be used when the results are shared. If you agree to participate, you will be expected to meet at a mutually agreed upon time with the principal investigator at a location to be determined, in Garden River.

**Potential benefits**

By participating in this study, you will be helping to create a guideline for other First Nation communities to follow when it comes to creating obesity prevention programs for their children. As a community, you will help to improve and shape the existing programs here at Garden River, adding to the success the programs have had so far. By helping other communities develop obesity prevention programs we will be able to improve their overall health and well-being, reducing the complications that come with obesity.

**Incentive**

You will be given a personal note and token of appreciation as acknowledgment of gratitude for your time. Your help will be much appreciated, as it will be beneficial to not only your community, but to others who are looking to carry out programs like the ones here.

**Acknowledgement**

The principal investigator would like to cite your responses in the finished document. All identifying information will be removed and replaced with an anonymous identifier known only to the principal investigator.

**Disclosure**

Any information obtained will be kept confidential and in a locked room at the School of Rural and Northern Health at Laurentian University for a period no longer than 1 year. At the end of the study, all audio recordings and personal identifiers will be destroyed and transcripts with no identifying information will be returned to Garden River. If you have any questions, please do not hesitate to contact the principal investigator at the email address above.

**Approval**

This project has been reviewed and approved by Garden River First Nation as well as the Laurentian Research Ethics Board.

\* For information regarding ethics or to file a complaint feel free to contact:

Research Ethics Officer

Office of Research Services

Telephone: 705-675-1151 ext 3681 or 2436

Toll free: 1-800-461-4030

**Consent Form**

I have read the information presented in the information letter about a study being conducted by Andrew Niles under the supervision of Dr. Darrel Manitowabi and Dr. Sheldon Tobe. I have had the opportunity to ask questions about my involvement in this study, and to receive any additional details I wanted to know about the study. I understand that I may withdraw my consent and refuse to participate in the study at any point with no consequences.

I give my consent to participate in the study

Yes     No

I give my permission to use an audio recording in order to collect information

Yes     No

---

Name of Participant

Signature

Date

**For participants who choose to give oral consent and not written consent:**

The individual \_\_\_\_\_ is agreeing to participate in this study voluntarily and understands the letter of information but is unwilling/unable to sign.

I give my permission to use an audio recording in order to collect information

Yes     No

---

Signature of Researcher

Date

Location

\* For information regarding ethics or to file a complaint feel free to contact:  
Research Ethics Officer

Office of Research Services

Telephone: 705-675-1151 ext 3681 or 2436

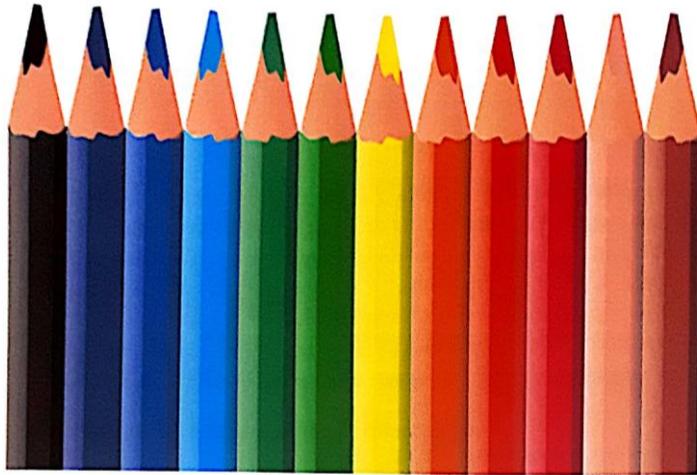
Toll free: 1-800-461-4030

## Appendix F

### Conversation Guide:

1. Please state your involvement with the obesity prevention program. (Context, Body, Mind, Spirit)
2. How long have you been involved with the program? (Body)
3. What do you think has worked best so far? (Body, Mind)
4. What do you think needs to be improved? (Body, Mind)
5. How do you think the children feel about participating in the program? (Mind)
6. Can you share a memorable experience? (Mind)
7. What do you think are the biggest challenges when trying to implement a program like this? (Body, Context, Mind)
8. What do you think are some key resources needed to start programs like this and keep them going? (Body, Context, Mind)  
  
As a clinician do you see needs that maybe others do not?
9. Is it important for programs like these to have cultural and traditional components? If so please explain. (Context, Spirit, Body, Mind)
10. Is there anything else that you think is important for me to know? (Context, Spirit, Body, Mind)

Appendix G



**SUMMER/NIIBIN  
KETEGAUNSEEBEE  
BINOJIIK  
MINO BIMAADIZIWIN**

**Garden River Children Living the Good Life**

Call the Garden River Wellness Centre, during the months of July-September, to book an appointment with Registered Practical Nurses [REDACTED].

Incentives given to participants.



**Children grades  
JK-12**

**Health  
Assessments**  
(Height, weight, BMI)

**Screening for  
diabetes**

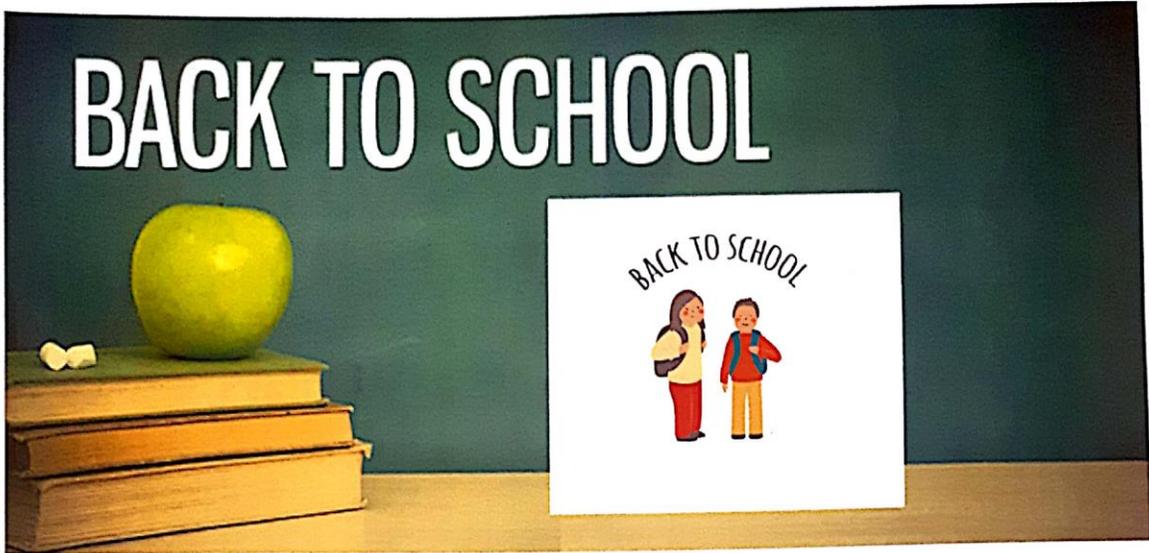
**Activity &  
Nutritional  
Assessments**

**INCENTIVES**

**GARDEN RIVER  
WELLNESS CENTRE**

23 Shingwauk Street  
Garden River, ON  
Telephone: 705-946-5710

BY APPOINTMENT ONLY



# KETEGAUNSEEBEE BINOJIIK MINO BIMAADIZIWIN

Garden River children living the good life

<p>Grades 1-12</p> <p>WHEN: July-September TIME: By appointment only WHERE: Garden River Wellness Centre</p> <p><b>Register with clinic reception at (705)946-5710, ext. 226</b></p>	<p>INCENTIVES FOR PARTICIPANTS</p> <p>Health Assessments</p> <p>Screening for diabetes</p> <p>Activity &amp; Nutritional Assessments</p>
<p>Program delivered in partnership with [REDACTED], Registered Dietitian &amp; [REDACTED], Health Educator/Promoter; Maamwesying, North Shore Community Health Services Inc.</p>	

 **MAAMWESYING**  
NORTH SHORE COMMUNITY HEALTH SERVICES INC.



Garden River Wellness Centre  
23 Shingwauk Street  
Garden River, ON  
Telephone: (705)946-5710





# **END OF THE SUMMER BACK TO SCHOOL SCREENING CLINIC**

**Visit the Wellness Centre and be  
screened for:**

*Head Checks*

*Body Mass Index (BMI)*

*Up-to-date Immunization Cards*

***(please bring immunization card)***

*Diabetes Screening*

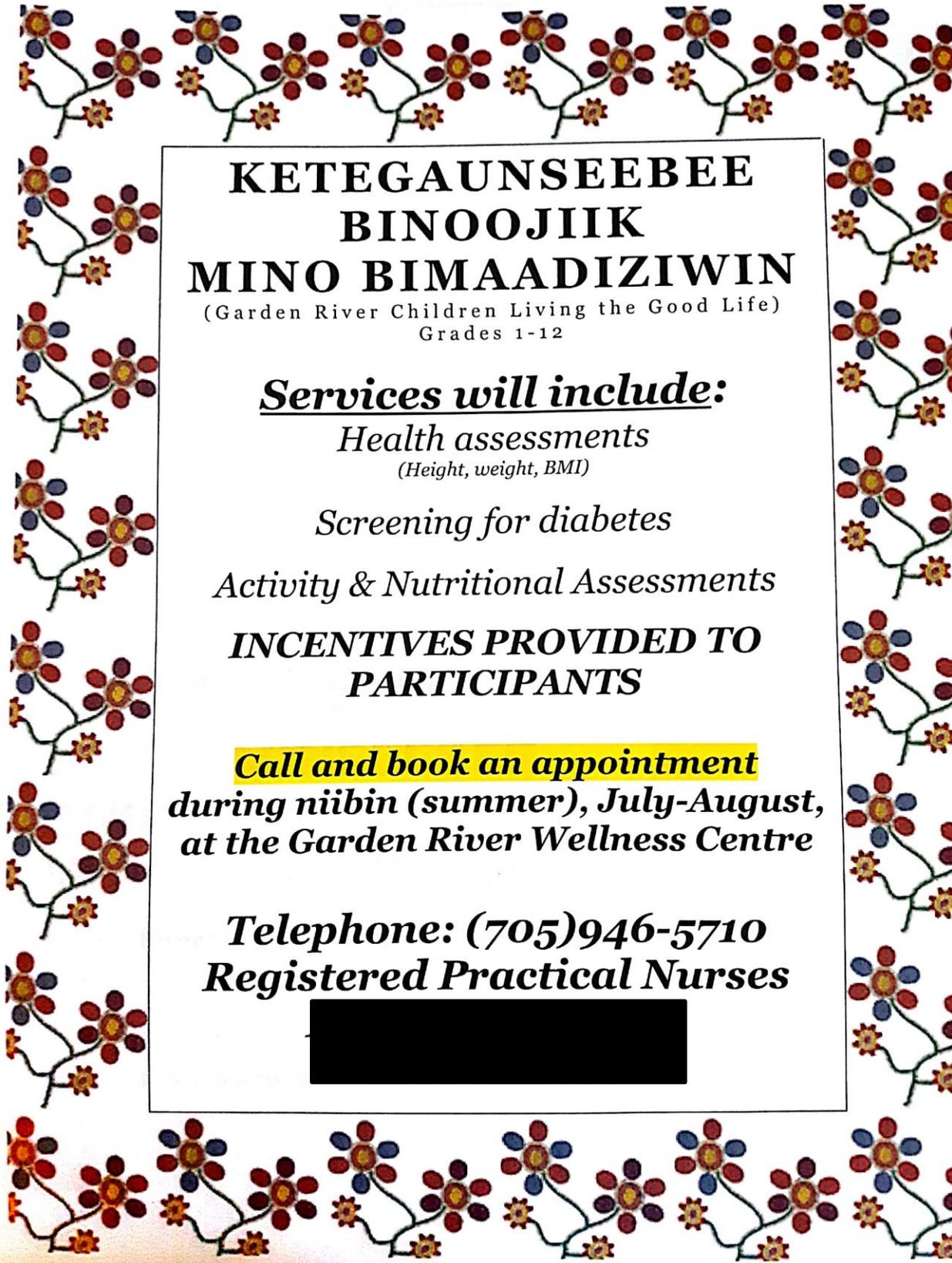
*Nutrition information*

***FREE BACK PACKS & SCHOOL SUPPLIES  
For ALL BAND MEMBERS who get  
screened***

***Call and book an appointment for the month  
of AUGUST at the  
Garden River Wellness Centre @***

***Telephone: 705-946-5710- [REDACTED]***





**KETEGAUNSEEBEE  
BINOOSIJK  
MINO BIMAADIZIWIN**

(Garden River Children Living the Good Life)  
Grades 1-12

**Services will include:**

*Health assessments  
(Height, weight, BMI)*

*Screening for diabetes*

*Activity & Nutritional Assessments*

**INCENTIVES PROVIDED TO  
PARTICIPANTS**

**Call and book an appointment**  
*during niibin (summer), July-August,  
at the Garden River Wellness Centre*

**Telephone: (705)946-5710**  
**Registered Practical Nurses**



## Appendix H

Dear Parent/Primary Caregiver:

The Garden River Wellness Centre is offering a screening program for our children to determine obesity and diabetes rates from grades 1 to 12. This goal of the program is to prevent the incidence of obesity and diabetes in our young population further eliminating other chronic disease that are directly linked to diabetes. Health Canada states, "Children and youth who are obese are at higher risk of developing a range of health problems and weight issues in childhood are likely to persist into adulthood." ( Health Canada, Childhood Obesity, 2014)

In addition, diabetes in our First Nation population is soaring at such a high rate and developing earlier, we are seeing it in adolescents and children. (Harris, 2014)

Our program has three different components:

A questionnaire for parents/care givers that assesses influences and behaviours they have on their childrens' eating habits, nutrition intake and physical activity.

A physical assessment of their child that includes measurements for height and weight, BMI (Body Mass Index) and a capillary blood sample (finger poke) to measure their blood sugar.

Optional referral to our Traditional Health Program who is offering a culturally based, safe session for children and youth to discuss any issues they may be experiencing that could be directly or indirectly contributing to their mental or physical health.

Incentives will be provided to your child upon completion of their participation in the program.

All information will be kept here in your child's personal health record and shared only with those providers who are within the circle of care for your child's health. Ie Nurse, Dietician, Physician etc. Should we need to utilize your child's information in the future for research purposes, you will be contacted by phone and asked to come in and sign a permission form.

Appendix I



**Garden River Wellness Centre**  
**NAAN-DOO-WE'AN**

23 Shingwauk Street, Garden River, Ontario, P6A 7B2  
Phone (705) 946-5710 Fax (705) 946-2725

**COMMUNITY BLOOD GLUCOSE SCREENING**  
**for Children Living Well Assessments**

Name: \_\_\_\_\_

Age: \_\_\_\_\_

**RISK FACTORS**

- Ht/Wt ratio above 95<sup>th</sup> percentile
- Family History of Diabetes (more importantly in mother/ maternal, Grandmother)
- Presence of Acanthosis Nigricans (a darkening/ hyper-pigmented skin thickening around neck, groin, armpit)

**LIFESTYLE PATTERNS and NUTRITIONAL PATTERNS**

# of sugary beverages/day      1   2   3   4   5

# servings of milk products/day   1   2   3   4   5

# servings of vegetables/day      1   2   3   4   5

# servings of fruit/day            1   2   3   4   5

Keep in mind all sports, outside play and leisure walks for activity.

Sugary drinks include sports drinks, soda, energy drinks, flavoured waters etc.

**SUGAR TEST**

<u>Capillary Blood</u>	<u>Sugar Level</u>	<u>Recommended Level</u>
FBS or RBS	_____ mmol/L	5.0 mmol/L - 9.0 mmol/L

Last meal/snack/beverage consumed \_\_\_\_\_

\_\_\_\_\_  
(Blood Sugar Test Administered by)

\_\_\_\_\_  
(Date)

**Referred To:**

- Nurse Practitioner
- Physician
- Registered Dietician
- Physiotherapist
- Psychologist
- Traditional Services
- Chronic Disease Nurse

*mental health youth worker.*

Original to Client    Copies:    a) **Abnormal** result – attach CHAC referral from and send to Nurse Practitioner    b) **Normal** result – place in Client Chart

## Appendix J

### *Physical Activity Questionnaire (Elementary School)*

Name: \_\_\_\_\_

Age: \_\_\_\_\_

Sex: M \_\_\_\_\_ F \_\_\_\_\_

Grade: \_\_\_\_\_

Teacher: \_\_\_\_\_

We are trying to find out about your level of physical activity from *the last 7 days* (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

**Remember:**

1. There are no right and wrong answers — this is not a test.
2. Please answer all the questions as honestly and accurately as you can — this is very important.

1. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one circle per row.)

	No	1-2	3-4	5-6	7 times or more
Skipping .....	<input type="radio"/>				
Rowing/canoeing .....	<input type="radio"/>				
In-line skating .....	<input type="radio"/>				
Tag .....	<input type="radio"/>				
Walking for exercise .....	<input type="radio"/>				
Bicycling .....	<input type="radio"/>				
Jogging or running .....	<input type="radio"/>				
Aerobics .....	<input type="radio"/>				
Swimming .....	<input type="radio"/>				
Baseball, softball .....	<input type="radio"/>				
Dance .....	<input type="radio"/>				
Football .....	<input type="radio"/>				
Badminton .....	<input type="radio"/>				
Skateboarding .....	<input type="radio"/>				
Soccer .....	<input type="radio"/>				
Street hockey .....	<input type="radio"/>				
Volleyball .....	<input type="radio"/>				
Floor hockey .....	<input type="radio"/>				
Basketball .....	<input type="radio"/>				
Ice skating .....	<input type="radio"/>				
Cross-country skiing .....	<input type="radio"/>				
Ice hockey/ringette .....	<input type="radio"/>				
Other: .....	<input type="radio"/>				
.....	<input type="radio"/>				
.....	<input type="radio"/>				

2. In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? (Check one only.)

- I don't do PE .....
- Hardly ever .....
- Sometimes .....
- Quite often .....
- Always .....

3. In the last 7 days, what did you do most of the time *at recess*? (Check one only.)

- Sat down (talking, reading, doing schoolwork).....
- Stood around or walked around .....
- Ran or played a little bit .....
- Ran around and played quite a bit .....
- Ran and played hard most of the time .....

4. In the last 7 days, what did you normally do *at lunch* (besides eating lunch)? (Check one only.)

- Sat down (talking, reading, doing schoolwork).....
- Stood around or walked around .....
- Ran or played a little bit .....
- Ran around and played quite a bit .....
- Ran and played hard most of the time .....

5. In the last 7 days, on how many days *right after school*, did you do sports, dance, or play games in which you were very active? (Check one only.)

- None .....
- 1 time last week .....
- 2 or 3 times last week .....
- 4 times last week .....
- 5 times last week .....

6. In the last 7 days, on how many *evenings* did you do sports, dance, or play games in which you were very active? (Check one only.)

- None .....
- 1 time last week .....
- 2 or 3 times last week .....
- 4 or 5 last week .....
- 6 or 7 times last week .....

7. On the last weekend, how many times did you do sports, dance, or play games in which you were very active? (Check one only.)

- None .....
- 1 time .....
- 2 — 3 times .....
- 4 — 5 times .....
- 6 or more times .....

8. Which *one* of the following describes you best for the last 7 days? Read *all five* statements before deciding on the *one* answer that describes you.

- A. All or most of my free time was spent doing things that involve little physical effort .....
- B. I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics) .....
- C. I often (3 — 4 times last week) did physical things in my free time .....
- D. I quite often (5 — 6 times last week) did physical things in my free time .....
- E. I very often (7 or more times last week) did physical things in my free time .....

9. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday .....	<input type="radio"/>				
Tuesday .....	<input type="radio"/>				
Wednesday .....	<input type="radio"/>				
Thursday .....	<input type="radio"/>				
Friday .....	<input type="radio"/>				
Saturday .....	<input type="radio"/>				
Sunday .....	<input type="radio"/>				

10. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

- Yes .....
- No .....

If Yes, what prevented you? \_\_\_\_\_

## Appendix K

### *Physical Activity Questionnaire (High School)*

Name: \_\_\_\_\_

Age: \_\_\_\_\_

Sex: M \_\_\_\_\_ F \_\_\_\_\_

Grade: \_\_\_\_\_

Teacher: \_\_\_\_\_

We are trying to find out about your level of physical activity from *the last 7 days* (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

**Remember:**

3. There are no right and wrong answers — this is not a test.
4. Please answer all the questions as honestly and accurately as you can — this is very important.

1. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one circle per row.)

	No	1-2	3-4	5-6	7 times or more
Skipping .....	<input type="radio"/>				
Rowing/canoeing .....	<input type="radio"/>				
In-line skating .....	<input type="radio"/>				
Tag .....	<input type="radio"/>				
Walking for exercise .....	<input type="radio"/>				
Bicycling .....	<input type="radio"/>				
Jogging or running .....	<input type="radio"/>				
Aerobics .....	<input type="radio"/>				
Swimming .....	<input type="radio"/>				
Baseball, softball .....	<input type="radio"/>				
Dance .....	<input type="radio"/>				
Football .....	<input type="radio"/>				
Badminton .....	<input type="radio"/>				
Skateboarding .....	<input type="radio"/>				
Soccer .....	<input type="radio"/>				
Street hockey .....	<input type="radio"/>				
Volleyball .....	<input type="radio"/>				
Floor hockey .....	<input type="radio"/>				
Basketball .....	<input type="radio"/>				
Ice skating .....	<input type="radio"/>				
Cross-country skiing .....	<input type="radio"/>				
Ice hockey/ringette .....	<input type="radio"/>				
Other:					
.....	<input type="radio"/>				
.....	<input type="radio"/>				

2. In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? (Check one only.)

- I don't do PE .....
- Hardly ever .....
- Sometimes .....
- Quite often .....
- Always .....

3. In the last 7 days, what did you normally do *at lunch* (besides eating lunch)? (Check one only.)

- Sat down (talking, reading, doing schoolwork).....
- Stood around or walked around .....
- Ran or played a little bit .....
- Ran around and played quite a bit .....
- Ran and played hard most of the time .....

4. In the last 7 days, on how many days *right after school*, did you do sports, dance, or play games in which you were very active? (Check one only.)

- None .....
- 1 time last week .....
- 2 or 3 times last week .....
- 4 times last week .....
- 5 times last week .....

5. In the last 7 days, on how many *evenings* did you do sports, dance, or play games in which you were very active? (Check one only.)

- None .....
- 1 time last week .....
- 2 or 3 times last week .....
- 4 or 5 last week .....
- 6 or 7 times last week .....

6. *On the last weekend*, how many times did you do sports, dance, or play games in which you were very active? (Check one only.)

- None .....
- 1 time .....
- 2 — 3 times .....
- 4 — 5 times .....
- 6 or more times .....

7. Which *one* of the following describes you best for the last 7 days? Read *all five* statements before deciding on the *one* answer that describes you.

- F. All or most of my free time was spent doing things that involve little physical effort .....○
- G. I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics) .....○
- H. I often (3 — 4 times last week) did physical things in my free time .....○
- I. I quite often (5 — 6 times last week) did physical things in my free time .....○
- J. I very often (7 or more times last week) did physical things in my free time .....○

8. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday .....	○	○	○	○	○
Tuesday .....	○	○	○	○	○
Wednesday .....	○	○	○	○	○
Thursday .....	○	○	○	○	○
Friday .....	○	○	○	○	○
Saturday .....	○	○	○	○	○
Sunday .....	○	○	○	○	○

9. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

- Yes .....○
- No .....○

If Yes, what prevented you? \_\_\_\_\_

## Appendix L

### Parental/Primary Caregivers' Assessment Questions

(Children's Eating and Lifestyle Habits)

	None	A little	Some	Often	Most	All
How much Influence do you have to WHAT and WHEN your child(ren) eat?	0	1	2	3	4	5
Do you encourage your child(ren) to eat a variety of foods?	0	1	2	3	4	5
Do you ever use food as a means to pacify (soothe) your child(ren)?	0	1	2	3	4	5
Do you ever use food as a reward for your child(ren)?	0	1	2	3	4	5
Do you permit your child(ren) to eat meals/snacks in front of the television?	0	1	2	3	4	5
Do you eat meals together as a family?	0	1	2	3	4	5
How often do you eat fast food?	0	1	2	3	4	5
Have you breastfed (nursed) any of your children or do you plan on breastfeeding any future children?		Yes			No	
Does your child(ren) eat a healthy breakfast daily?	0	1	2	3	4	5
Does your child(ren)'s portion sizes follow nutrition guidelines (Canadian Food Guide)?	0	1	2	3	4	5
Is your child(ren) permitted to self regulate their meals?	0	1	2	3	4	5
Are sugar sweetened drinks consumed regularly?	0	1	2	3	4	5
Do you permit your child(ren) to use "screen time" regularly? (T.V., computer, electronic games, tablets, internet)	0	1	2	3	4	5
Do you feel your child(ren) gets enough sleep regularly?	0	1	2	3	4	5
Do you feel your child(ren) experience more stress than "normal"? (school related, social, home, work, other)	0	1	2	3	4	5

**Please circle all the age groups of the child or children your answers applied to:**

**0-4      5-12      13-18**

Comments:

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## Appendix M

*So... we then don't know what kind of person that should be your could be? We don't have enough expertise in that area to really say. Here's what a strategy should look like built on best practices around a screening program for kids. Here's the strategies. Here's everything that you need to do. Here's all the checklist, the program right from the end, even including the evaluation of what needs to happen. Right up to the roll up report. So if if we had a position description, I'm sure I could find the funding, but I just don't know the type of person that we'd be looking at to be able to do that kind of work it is it some sort of researcher, is it an epidemiologist? (180502-201)*

*I think they should hire a student to do this. Someone to do it, someone that's here all summer. And that way they can stay consistent with their filling out the forms and how the programs delivered because if you had three or four different workers, you're not gonna get consistent data, I don't think. (180503-400)*

*That's how we think of it. Instead of it being a super sad time. So I just find even with like children's health, it might not be taken as seriously, you know, I'm glad there was the incentive to get more people out and, but if there was no incentive, I don't know how successful the program. And I don't know if we'd have the numbers that we did to be honest. And that's to me, that's a shame. (180503-401)*

*And having access to their resources, cause public health will develop all kinds of tools, well it's like, okay, how do we get those tools. Do we have to buy them or even, even the kids that go to teachers, like that's only for the school, but that would be good to have that back program idea. (180502-200)*

*So we got training on that, and basically it was just it was like a tablet form that they would use and the child basically sits down and it has pictures and music and questions in basically just ask you different questions and you just check yes or no. A scale of one to 10, that kind of thing. (180502-102)*

*And those were taken right from the RNAO best practice guidelines because they recommended that parents and caregivers should have a direct role in the child's eating and nutrition. (180502-102)*

*But you know, I liked when the kids were happy leaving, especially if they got the sugar checked and they were proud of themselves for getting their sugar checked because they never did it before and knowing that they can get it done and just being happy that they came in and look at the height and weight, and we know encourage them, this and that. We taught them a little bit about diabetes, and some of them already know about diabetes because it's in their family and they see their mom or their dad, or their*

*grandparents. They they'll have to prick their fingers. And I'm just like I like, I like dialoging with kids and teaching them things. That's something I like to do. So I just like the whole thing in general. (180503-401)*

*They like it. Yeah, they look forward to it like these. They see me every year now and I watched them grow right. Like I said, they know they're coming for a reason and it makes a good day out of it like the family because a lot of them have bigger families and then bring all their children. So I've never had an issue. (180502-402)*

*And they've put on some really good programming. Because once you do an assessment, you have to provide teaching as to where the weaknesses are with the clients. So it was nice to see really effective programming put in place. But I can't remember, her name is [Name] can't remember she was worked at the healing lodge, and she and the dietitian put on some really great programming for diabetes prevention. (180503-400)*

*So we may not actually see weight loss, but we see healthy dietary changes. And they have fun with food because there's lots of kids who just refuse to taste new foods. And they're excited about it. (180502-200)*

*So the existing, the existing providers that are here, the clinicians that's who we have to work with just like the dietitian in the health promotions program whenever they can be available for follow-up...So we have to wait to see when they're available because it's an outside program. And then finally they end up coming up with something. So I'm always constantly after them to make sure that those kids are being followed up appropriately in there. (180502-102)*

*The rooms are really limited here. Space is just tight. (180503-401)*

*Things like a bigger room, staff. teaching aids. I don't think getting the numbers is a problem. I think the numbers are pretty good. It'd be nice to have more numbers. (180503-400)*

*When you start talking in terms of diet and changing, changing lifestyle and changing, you know, getting them to exercise more and dad probably need to exercise. They probably have a sedentary family [laughs]. It's a lot of lifestyle changes that they have to get used to. (180502-300)*

*That's how we think of it. Instead of it being a super sad time. So I just find even with like children's health, it might not be taken as seriously, you know, I'm glad there was the incentive to get more people out and, but if there was no incentive, I don't know*

*how successful the program. And I don't know if we'd have the numbers that we did to be honest. And that's to me, that's a shame. (180503-401)*

*Yeah, like when we were weighing the family members. And you'd have some family members that are bigger, and you have some family members that are really small. And so they're really. I think we should bring them individually. But we like to get people through quicker, sometimes you gotta bring them in. (180503-400)*

*For some kids I do, like because there were kids who were overweight and I do know, especially girls right, especially girls within the adolescent/preadolescent age. That's a sensitive subject. (180503-401)*

*Well just what I said. They get self conscious that they're overweight. Affects their self-esteem. I don't think some of them really want to do it, but their parents bring them there. So they don't really have any other choice. (180503-500).*

*Well, we don't have a good system, so if I wanted to see and plus we had changes with our electronic charting, so we couldn't get into old electronic charting. So when I went and tried to go backwards to see who had seen, It didn't keep track of that data. And we didn't have a good check system. Some of the, the forms have been changed along the way they get all say, referred to a dietitian. The bottom of the page will list the providers referred to physio, dietitian, nurse, whatever. So that's been changed on the forms. So that's helped. So I either needed checklist keep or we need to keep a checklist with the, with the back to school by new referrals. (180502-200)*

*Did you get you know how many kids are coming in, or did you get? Did you see them yet? "Well no, I gotta figure what my schedule." So we have to wait to see when they're available because it's an outside program. And then finally they end up coming up with something. So I'm always constantly after them to make sure that those kids are being followed up appropriately in there. They've attended like the group or whatever. So that's, why are we doing this program right, if we don't have proper follow? (180502-102)*

*So it was kind of like that kind of surrounded all these different components. So then [Name] got the team to start implementing that questionnaire, and I am not sure, if it was consistent all the way through...And then what I can say, consistency, we've had different opinions that have been upfront doing the assessments, but again, if you have one nurse doing it, and then maybe the other nurse did in a certain way to feed so do the assessment sheet. But you'd say all she will the things on the back over here. While students would tell me the sheets are really good for a while, then all of a sudden we don't see this part. It's missing because she didn't write it down and that nurse may not have put that down, she might have just went right to the EMR system and just put it*

*in there. So it was just consistency meaning that when you do this, make sure that you have everything is filled out and then don't put any more on here. It's missing because she didn't write it down and that nurse not have put that down, she might have just went right to the EMR system and just put it in there. So it was just consistency meaning that when you do this, make sure that you have everything is filled out and then don't put any more on here. (180502-102)*

*The questionnaire kind of that's where the mental health piece kind of started coming in. Because anxiety was also a big factor. I found in our reserve. The numbers of people with anxiety and depression are a lot bigger than people I think realize. And it even was affecting the kids, right? So. Some kids were coming in and they are seeking the psychologists for anxiety and depression and things like that, and parents kinda don't know what to do with that. So. Then we started asking questions about, you know...I can't remember what the questions were, I wish they had a thing, but I know some of it were, you know, do you feel more stressed about school, work, home, like we had little questions for the kids to fill out necessarily not the parents. So that was a questionnaire just touching base on kids' mental health because that was important for us to keep an eye on too. I mean, we thought we might as well, right since it's more child focused. (180503-401)*

*Yeah. So there's that. Just promoting traditional foods and traditional activities and. The whole we're not just looking at. You know, just eating, it's your whole lifestyle and everything, and mental health also. (180502-200)*

*The back to school program, the cultural component is. It just depends on what you mean by cultural component and what we mean by cultural component cause we're, just by the mere fact that we are First Nation and we think the way we think and we do things the way we do things, we don't always, we don't always identify that a being "a cultural way" or a "cultural means or purpose". So we don't do anything "special" about implementing or delivering this program. Does that make sense? So we we're not purposeful [emphasis] about being cultural [emphasis], but we are. Because just who we are and how we think and talk and deliver and engage with the community. And you know. All those things. (180502-201)*

*But what I also feel like is a normalization of obesity in our communities which I don't know how to...Like oh my aunty, my sister, my cousin, you know all my parents are overweight, so it's okay for me to be overweight. You know what I mean? We need to not normalize obesity. Cause it's not normal. It was never normal in our communities. So we need to get away from that. I feel like this kind of like a defeatist attitude. Diabetes is in my family, I saw I'm going to get it. (180503-500)*

*One of the challenges is the parents think the kids are healthy. So you have to get around the parents. They don't see their kids as being overweight. So that's like one*

*area you have to be careful with the way, you know you're checking the body mass and, "no they're fine. Yeah, they eat healthy and I cook healthy." So it's like the parents feeling threatened about how they're raising their kids and what they're giving their kids to eat. (180502-200)*

*And then of course, the other children who have the 90 or the 95th percentile. We need do look at other factors, but we put them in there anyway, because even though we can say while there may be for their frame, you know, a little bit of a bigger size, and you looked at mom and dad, okay, we can rationalize. But you know what? It's not gonna hurt to have em going there. Any ways to get the follow up with a dietitian because our whole community in our First Nations in general, are in an epidemic with diabetes anyway. So let's do this whole. Let's be proactive about it and do something now because our other community members who are already at this stage of the game, they're already kind of like up the, you know, the intervention phase or the rehab phase, and that's kind of, not too late for that. But I mean in terms of prevention and promotion. So let's get them now when they are young and the information is getting out to them. Prevent complications, all that kind of stuff. (180502-102)*

*The incentives really helped to help the parents bring the students in. Yeah, it's not really, the incentive doesn't really go to the students, for high school it goes to the students. The buy in for that program isn't as good as the getting parents in, you know, they're the ones that control the budgets in the home, and this really helps them to do some back to school shopping and getting their kids ready for school. So they will come in and do the bring their kids to do the screen. (180502-201)*

*So we did different programs. Like Eat the Rainbow, we started that couple of years ago. We've done family kitchen. So family kitchens was part of the diabetes prevention program, but we targeted. So if somebody in the family had diabetes. So a grandmother and aunt and uncle, whatever. And we're talking type two diabetes. And then the whole family came, so it was like to get the older generation, the kids, the younger generation. And so we looked at the kids were on this that needed to come and see the dietitian. So sometimes that was one way to get them in. It's not the kid that centered, the whole family's coming in and the family kitchen was a diabetes prevention program that we ran. For several years. So they would they would get 1 session. So the whole family comes in the program ran over supper hour. We would start at 4:30 and run till whenever we were finished, 8'oclock on some nights. And then even one week do so Make and Take is a program where we're doing things in Mason jars. So we might do overnight oatmeal. We've done salads so in the Mason jars. So you're lining up your foods. Mason jars are popular now. You're lining up your tuna on the bottom and then all your fillers and your lettuce on top. So you can talk about I'll talk about what's in there and how to make it, how to prepare it, what's healthy about it. So it's part of*

*cooking class. So it's a good variety of cooking. They're not exactly using a stove and cooking because we can't have those facilities all the time. We actually do Mason jar cooking classes. (180502-200)*

*And we also did Family Kitchen. And Family Kitchen is where we worked one on one with one family, and they've get one on one time with the diabetes nurse educator, with the dietitian, and also with the health promoter. It always starts with some education based on many planning, meal balance and food groups, portion sizes and basic food safety. We eat. The menu is based on what the family normally eats of the dietician puts a healthy spin on it. And they also get to try new things. They also get the pokie-poke so they get their blood glucose levels tested. And we play jeopardy. (180503-500)*

*So Family Fit, which was formerly known as practical skills for parents and children that has a set curriculum. And that program four sessions. And that is healthy lifestyles, parenting, nutrition and physical activity. The program was created by teachers and there is specific curriculum for adults and specific curriculum for children and they each get their own work book. (180503-500)*

*The only follow up like other than like say with the dietitian would be aside from the dietitian would be if the if the measurements are of abnormal values, so saying the child comes in with A1C's over 8, and the guideline has changed a couple of times, but it was really high and all for their age in their activity and everything that's going on. Then that's a given that that referral would be automatically to their provider, their doctor, maybe a letter sent. A referral is made. If a referral, if it's internally than we would do it within our EMR system. If it's externally, we'd fax something out, or send them a letter. And that would happen very timely. (180502-102)*

*If something comes up here and they're either my patient or they don't have a family practitioner of primary health care person than they would be referred to one of the NPs [Nurse Practitioner] ... for follow up. So we would order blood, again, and refer them off to the dietitian and all that kind of stuff. Because this is just a screen, right? (180502-300)*

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