Exploring the development and impact of an Olympic wrestling sport program in Miawpukek Mi'kamawey Mawi'omi (Miawpukek First Nation): A case study

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Dedication

This thesis is dedicated first to Winston and Buffy Silvey. They were both there through the tougher times, but not able to see it through to the end. You are both missed dearly.

As well, this thesis is dedicated to my mother and father. If it were not for them always dragging me to my martial arts classes even when I was lazy, this thesis and who I am today, would not exist. Again, to my mother for always believing that I would attend university and being patient with my 10-year undergraduate degree.

Also, this thesis is dedicated to the memory of Randy Ralph who had a dream that there would be an Olympic wrestling program in every Indigenous community in Newfoundland and Labrador (Letter of Support in Appendix 5). Sadly, he was taken from us before his dream could be fulfilled.

Lastly, this thesis is dedicated to all the Indigenous youth who are struggling with the legacy impacts of colonialism and residential schools. I hope the small amount of work I have done with only a few of you has had a positive impact on your lives.

Abstract

Physical activity has been shown to increase the physical and mental health of youth. Many rural and Indigenous communities offer sport programs. However, many of these sports are not highly accessible to youth for reasons such as social standing, gender, genetics, and physical fitness levels. The sport of Olympic wrestling if implemented correctly can be accessible to participants and could offer Indigenous youth another, more accessible option of physical activity. The purpose of this thesis is to examine the impact of developing and implementing an Olympic wrestling program with Indigenous youth.

Working within a Community Based Participatory Research framework and the Indigenous School Health framework, the first part of this thesis examines the needs of the Indigenous community in question and determines how the Olympic wrestling program should be developed and implemented. Following the needs assessment, the program was developed, implemented, and evaluated and the results showed that some youth gained significant changes in their physical and mental health. The program was further evaluated by some of participating youth through the use of photovoice, which showed increases in youth self-perception and self-esteem. Lastly, the changes in youths' holistic health were determined to have improved after competing with a team of other Indigenous youth at a major competition.

The Olympic wrestling program continues in the community with little help from the researcher and is showing a strong likelihood of being offered for the foreseeable future. Thus, this thesis demonstrates that by first creating a relationship built upon reciprocity, respect, and relationality, between implementers and an Indigenous community, in which the researcher is a resource and conduit to be used by the community, a highly accessible sport program such as Olympic wrestling, may have a positive impact on Indigenous youths' physical and mental health.

Acknowledgements and Contributions

It is such a cliché to say, “I have so many people I need to thank,” but there really are so many. If it was not for all these people and all that they have done for me I would never have survived this thesis. If I miss anyone please, accept my apologies. It was not done on purpose.

The Indigenous community of Miawpukek Mi’kamawey Mawi’omi (Miawpukek First Nation), NL along with St. Anne’s School for allowing me into their community, supporting this project, and helping me figure out the ins and outs as an advocate for Indigenous health. The kindness given to me by everyone at the school and community made this journey much easier and all the more valuable. Specifically, I need to thank Eddie O’Keffe, Paul MacDonald, and Rod Jeddore for always spending extra time guiding my work with the youth and for keeping the Olympic wrestling program going in the community. I thank them for all their support.

Dr. Adam Dubrowski who approached me to run a wrestling program and later accepted me as a PhD student. We went from punching each other in the face at boxing class to building a solid relationship between a mentor and mentee.

Dr. Catherine Donovan, who came on board with this PhD program and fought for me to have the opportunity to accomplish it. Her hard yet kind style has been key to me growing as a researcher and a person. She gave me wise words once, and they have stuck with me: “you have to stop being so sensitive.” I am still trying my best.

My supervisory committee of both Dr. Erin Cameron, and Dr. Carolyn Sturge Sparkes, who spent countless hours reviewing my documents, catching some major errors, and helping guide me through to the end. Their advice has been invaluable.

Dr. David Behm, who not only supervised my Masters, but also sat on my comprehensive exam committee, and continues to this day to be a mentor in any research project I start. He is never getting rid of me.

Richard Buote, who in a strange way gave me the idea to do a PhD, but also helped me with endless statistical knowledge. He might be a year behind me in the program, but he is miles ahead when it comes to statistics.

My parents who I believe are finally getting used to saying: “not that kind of doctor.”

Elliott Wong, for allowing me to live in his condo for a year at almost no rent while I wrote this entire thesis. Best friends are helpful in difficult times.

Lastly, all the Indigenous youth in Newfoundland and Labrador who took part in the wrestling program. I believe many of them think they learned a lot from me, but I learned far more from all of them.

Acknowledgement and Self-Location

The author, Dustin Silvey was an invited visitor to the land in which this research took place. Dustin worked as a visitor on the traditional territory of the Mi'kmaq peoples. Dustin is of non-Indigenous decent and recognizes the seen and unseen privilege that being a non-Indigenous settler has provided for him throughout his life, privileges in the health care system, in education, employment, and all other areas of a colonized society along with conducting this research. As a non-Indigenous researcher Dustin introduced himself as a resource of research and sport for the community of Miawpukek Mi'kamawey Mawi'omi (Miawpukek First Nation) Newfoundland, to use in order to create a wrestling program that they asked for after a small demonstration, structured in a way that suited their needs as stated by the community and its residents. Anything else would not be appropriate. All research was conducted with the help of several Indigenous community members who worked alongside Dustin for the entirety of the process. Every effort was made to insure this research created a positive experience for all those involved: youth, parents, Elders, and community members.

The official name of the Indigenous community is Miawpukek Mi'kamawey Mawi'omi in the Mi'kmaq language, of which the English translation is Miawpukek First Nation. From this point forward, the English translation will be used to describe the community except in Chapter 4 where the settler name of Conne River will be used.

The term Indigenous is used throughout the thesis to represent First Nations, Inuit and Metis Peoples of Canada except in Chapter 4 the term Aboriginal is used.

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Prologue

This prologue gives important information about my history to help the reader understand the reasons why I choose this research path. As suggested by Dr. Margaret Kovach (2009), a prologue extends a bridge of understanding between authors and readers. This research is a four-year story of my life. The prologue, interlude, and epilogue will allow readers a deeper understanding of who I am and why I choose to complete this project. All individuals identified in this thesis have given consent for their names to be used.

Hello, my name is Dustin Silvey. I am an only child: third-generation Indo-Canadian on my mother's side, and a first generation British-Canadian on my father's side. I honour both these influences. The majority of my relations are in Kamloops British Columbia (BC), while my extended relations live in Kelowna and Merritt, BC. I was born in Kitmat BC, but was raised in the small town of Quesnel BC, about 700 km north of Vancouver, BC. I have lived in four provinces in Canada, and three different countries, attending five different academic institutions.

I would like to be clear right away that before my late 20s I did not spend any time with Indigenous People outside of elementary and secondary school. It was not until I was 28 years of age during my Canadian International Development Agency internship that I was properly introduced to Indigenous Peoples and one of their many cultures. Ghost River Rediscovery (GRR), a First Nation organization based in Calgary, Alberta, took me on as an intern. GRR worked to rebuild the relationship of Indigenous People with the land along with focusing on educating non-Indigenous Canadians. The organization, specifically Mike Lickers, a Mohawk man from Six

Nations Ontario, introduced me to Indigenous Peoples, the atrocities that had been done to force Indigenous Peoples to assimilate and/or remove them from Canadian society, and the legacy impacts of these atrocities. Before this I would not say I was an advocate for Indigenous Peoples' health, however, after this experience I started to think differently. I started to understand how wrong my views about Indigenous Peoples had been my whole life all because I was not educated on the subject. One of the key facts that stood out to me from my short education with GRR was that the residential schools had taken away youths' knowledge about how to parent and how to be part of a family, as this had been stolen from them. I have never lived close to my extended family, and being an only child I found my family within my friends, the majority of which came from sports. As research has shown in recent years, sports are a great way to build community capacity and also lead to a sense of family. This was the beginning of my journey towards exploring how a wrestling program built with an Indigenous community could be a tool to building community capacity.

Sports

Like many Canadian kids of the 80's, I started my sports career in soccer, baseball, volleyball, and basketball. I was horrible at all of them. I was not a team-sports person. I hated the pressures from my teammates that were put on my non-athletic body and non-completive mind. I preferred being alone because there was no pressure on me to be anyone specific. When alone, I could just be me playing on my Nintendo or biking through the trails near my home. This need to be alone may have stemmed from issues I had in school with bullying, and I felt the bullying only followed me and intensified in team sports. I am a mixed raced only child of my

father, a British immigrant to Canada after World War II, and my mother, a second-generation Indo-Canadian. Because of my mixed heritage, I was never brown enough for the Indian kids, and I wasn't white enough for the white kids. And what did team sports do? They just put me in the same situations I had to endure every day at school, with the added pressures of winning a youth soccer/basketball/volleyball/baseball game. I realized I didn't want to put myself in more situations where I felt inadequate around a group of children with whom I already did not fit. I stopped participating in sports.

One day, my mother told me my best friend and his brother had been attending Kung Fu and she was going to sign me up for it. A bit nervous about not having a clue what I was doing or what the atmosphere would be like, I attended. As anyone who has ever stepped into a gym, course, classroom, or new job knows, that first day is intimidating. When I walked in it felt like all the kids there looked at me and began sizing me up. All I wanted to do was run. Everyone looked so proper standing there in his or her uniforms, laughing, and having fun. While my mother was speaking to the instructor one of the kids came over and started talking to me. His name was Colin, but they called him High Tower because he was over six feet tall at 14 years of age. He introduced me to everyone else and I felt more and more comfortable as the class proceeded. I remember my mother sticking around the first class to make sure I was OK, and after that class I was sold on this sport. It was somewhere I could be myself because my teammates didn't put pressure on me to do well: my actions didn't impact a team's goal of winning. I had a team that just supported me to do well but didn't criticize my failures. For example: when I went to

move up in rank for the first time I had to do a test with just the instructor and myself present. I was so nervous that I started to cry and couldn't finish the grading. The next week during class the instructor had me do all the parts of the test in front of the class during a "fun practice" session. After the class he presented me with my ranking, telling me that I had been tested during the practice. I honestly, did not have a clue this is what was happening, but this showed me that I could accomplish the necessary tasks to move up in rank. This first success in sport was the foundation for the high level of confidence I would later have in life.

I have continued in martial arts my whole life. I hold a black belt in Kung Fu, two black belts in Tae Kwon Do, and a blue belt in Jiu Jitsu. I was a national champion in Tae Kwon Do, ranked nationwide in wrestling, and ranked second in the world for two years in Kung Fu. As with many martial artists, I transitioned into Mixed Martial Arts (MMA) when it started to become popular around 2005. For three years I was lucky enough to train with Bill Mahood, one of the best MMA competitors in Canada at the time. Again, at the first practice with his team, I still felt those insecurities I did at my first Kung Fu class (I wonder if those feelings ever really do go away), as Bill was very matter of fact, and did not seem to care if I was there or not. As time went on though, Bill took me under his wing and when he started to manage the best MMA team in western Canada, he took me with him to Vancouver, BC. There, I trained with some of the best competitors in the world and this is where I had an eye opening experience into my confidence or lack thereof.

Training with some of the best combat sport competitors in the world is a double-edged sword: I was getting some of the best training I could ever imagine. However, I also got beat up, a lot. Not only did I believe I was the least skilled on this team, I was also the smallest member (competing at 69 kg). I would often joke with the team about just being lucky to be there because Bill had brought me with him. When I did perform well against a teammate in training, I always assumed it was because they were taking it easy on me in order to make me feel good about myself. It wasn't until Ryan Chiappe, one of my teammates, took me out for dinner one night that things started to change.

Ryan sat me down in his favorite restaurant and when we began consuming our meals he looked me in the eyes and said, "Dustin, you know I like you, but there is one thing about you that really [upsets] me." I sat there staring at him wondering what I had done to upset this rather large man whose fists were the size of my head. He continued, "You are such a great fighter, but you always play it off like you are [not a very good] fighter. You are for real, man. You hold your own with all of us. You give all of us [on the team] a hard time every practice. Stop talking yourself down all the time. You are legit."

I had never been so taken aback before. I didn't know what to say. Instead, I sat silently holding my tears back. This rough and tough fighter who I had never seen show a sensitive side other than when he spoke about his son, took the time to sit me down and in my opinion, change my life. He was right; I was a good fighter. The issue was more related to the fact that I never really believed in myself. Even with all the championships, rankings, and black belts, I still did not believe I was any

good. I think this stemmed from the constant bullying I endured in my youth. The harassment had stripped me of the ability to look at myself in the mirror and say, "you did well." My confidence had been stolen in my youth. In that simple and short dinner conversation, Ryan had given me everything I needed to realize I could do absolutely anything if only I put my mind to it. I had gone from a bullied youth, who lacked all faith in himself, to one of the best martial arts competitors in Canada. The only problem was I never really believed in what I had accomplished. Sports and the family of teammates I had over the years changed my life by giving me the confidence I needed to succeed and to understand that I had succeeded.

Education

As I have hinted in the previous section, I was not a confident youth. When I first finished high school, I was this scared little child, afraid to leave my parents' home. Neither of my parents went on to post-secondary education and my father never really believed I would either. My mother, however, had other ideas. She was sending her only child to university no matter what it took. She had told me since I was young that I was going to university; I was going to be something big. She would wake me up every day in the morning to get me up and off to school. When she found out I was bullied she would walk to meet me every day after school to make sure I was alright, and no matter how hard I faked being ill, she NEVER let me stay home from school.

When, after 13 long years of school, it finally came time to apply to universities, I didn't have any idea what to study or where to go. My mother, again, told me I was going to university and that was that. I was accepted into the

University of Northern British Columbia (UNBC), which was great because it was close to home, but again, what was I going to study? I remember my mother sitting down with me - on my Transformers bed sheets that still covered my bed- with the giant paper university calendar, going through all the different majors offered. All of a sudden a subject caught her eye, she looked up at me, and said, "Well you liked grass seeding for that forestry company, why don't you take forestry?" And, well, that's what I did. My first semester of school was all the basic sciences. These science courses lead to my second semester of post-secondary education consisting of me trying to get off academic probation. I just couldn't handle the 8:30 am courses without someone there to tell me to get out of bed and the three-hour labs three times a week made me feel like I was in a vice that was slowly crushing my brain into small chunks of mush. I was stressed about school, I didn't have much money, I had to deal with everyday life things that my mother took care of (yes, yes, I know!) like buying groceries, cooking, cleaning, etc. I wasn't prepared for this and it all took a toll on my mental health (before mental health was even mentioned in everyday society), which lead to me, just not really caring about school.

After surviving that first year and getting off academic probation, I went to college and then moved to the University of Victoria (UVic) where I accomplished little in the way of academia. What was so important that I had to do instead of pay attention in my classes during my first year at UVic? I spent far too much time socializing. Rather than focusing on what I was at university to do… but wait, what was I at university to do? What were my goals? To graduate? To get a piece of paper that said… what? I didn't even really know what my major was at that point. And

even when I would receive this random piece of paper, what would I do with it? I was thinking of being a physical education instructor, but I didn't really want to teach high school. Then I moved on to kinesiology, but I hated the courses. Then I thought about biochemistry, but that was just torture (I would later graduate with a degree in biochemistry and molecular biology from UNBC, but I don't want to get ahead of myself). I started to just take whatever random courses interested me because I just didn't have a clue what I wanted to do. Because of this lack of direction, for four years I just sort of floated by.

After my fourth year at UVic, a training partner motivated me to travel to Peru. This would be my first of many international trips alone. I was scared, but my friend had told me everything would be just fine. He was right. I returned home after three months a new person. My views on the world had changed and I finally understood that I needed to get my life together. I realized that the world owed me nothing, and if I wanted something, I was going to have to take it. I continued travelling and working odd jobs (on the oil rigs, call centers, etc.) for another year until I concluded I would go back to school with the idea of becoming a medical doctor. I applied back to UNBC for courses and was accepted into the biochemistry department and I ended up with the highest grade in my first-year biology course, I had almost a perfect GPA. What was the difference from UVic? I was motivated, I was focused, and I knew what I wanted to do. I studied all day every day, after school, on weekends, and often completed assignments months ahead of time. I had set a goal and I knew I could achieve it. And I did. I completed a degree in Biochemistry and molecular biology at UNBC. After six years of wandering aimlessly

through university, I locked down for three years and finally gave my mother the opportunity to see her son graduate with a university degree.

I later realized that medical school was not where I wanted to be and I went to Memorial University of Newfoundland to complete a Master's degree in Human Kinetics. But it wasn't until my first semester in my PhD that I was hit with a pretty big blow to my psyche. One my professors made the statement: "most people will not excel in education past their parents' level." As much as I disliked this professor, this message hit home and was a big shock to me. My mother finished high school and worked until I was born at which point she stayed home to raise me, and my father dropped out of high school to work, later returning to finish his high school diploma years later. High school was their level of education. Yet here I was, working to complete my PhD in Community Health. I questioned the professor about this and she was unable to give me an answer that satiated my curiosity.

For several weeks I wondered, what would be the reason I had exceled so far past my parents' levels of education. Would I fail at achieving my PhD because I wasn't supposed to be here? While it would take months and years to gain a deeper understanding of this question, this PhD journey has been an important part of answering this question. While this thesis highlights the power of sport in reconciliation, it also serves as a story about how sport is a powerful vehicle for youth development and leadership.

Chapter 1: Introduction

Background of the Issue to Be Addressed

Indigenous youth experience more physical and mental health issues than those of non-Indigenous youth in Canada (Alaghehbandan, Gates, & Macdonald, 2005; Edwards, Murray-Close, & Hudziak, 2008; Hajizadeh, Bombay, Asada, 2019; Kral, 2016; Kral et al., 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Pigford & Willows, 2010; Richmond, 2009; Tousignant, Vitenti, & Morin, 2013). Indigenous youth, when compared to other youth in Canada, are more likely to live in overcrowded homes, to be homeless, and to have less access to healthy foods, medical care and a proper education (McHugh, Holt, & Andersen, 2015; Reading & Wein, 2009). This has contributed to a suicide epidemic among Indigenous youth across the country and has brought international attention to the issues of Indigenous youth health (Alaghehbandan et al., 2005; Edwards et al., 2008; Hajizadeh et al., 2019; MacNeil, 2008). Colonialism and the legacy impacts of residential schools have led to many factors that have created an unhealthy environment for many Indigenous youth to grow and live. These factors consist of emotional trauma, lack of parental presence, family disruption, lack of access to social support, loss of identity, lack of access to early childhood development programs, poor housing, lack of youth programing, and lack of access to youth employment (Kral, 2016; Kral et al., 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Richmond, 2009; Tousignant et al., 2013). Thus, any

program that aims to improve the mental or physical health of Indigenous youth should aim to address at least one of these factors as part of their overall program.

Physical Activity

Physical activity has been shown to have numerous health benefits for non-Indigenous People such as a significant reduction in the risk of coronary heart disease, stroke, and diabetes, as well as the prevention of certain cancers (Chimen et al., 2012; Meyer, & Gullotta, 2012; Smith, 2012). Physical activity has been shown to contribute to combating osteoporosis, protecting against obesity, fostering the development of healthy muscles, bones, and joints, and increasing strength and endurance (Chimen et al., 2012; Meyer & Gullotta, 2012; Smith et al., 2012). Mental health also benefits from physical activity. Both Indigenous and non-Indigenous Peoples have been shown to have increased levels of physical self-concept, self-confidence, motivation, positive thinking, the ability to deal with stressful situations, as well as lower psychosomatic complaints when participating in physical activity (Forsyth, 2014; Hall, 2013; Mason, McHugh, Strachan, & Boule, 2018; Oh et al., 2015; Rachele, et al., 2014; Sibold, Edwards, Murray-Close, & Hudziak 2015; Warner & Dixon, 2013). One of the main ways youth participate in physical activity is through sport and sport programs offered in their communities. However, many sports are not accessible to youth. Many barriers such as social and economic standing, gender differences in sports, genetic advantages, and levels of fitness can prevent many youths, both non-Indigenous and Indigenous, from participating in sports (Forsyth & Heine, 2008; Gomes et al., 2011; Hardy et al., 2010; Johnstone & Millar 2012; Mason & Koehli, 2012; Oliver & Hamzeh, 2010; Robbins, Sikorskii, Hamel, Wu, &

Wilbur, 2009; Sequeira, Cruz, Pinto, Santos, & Marques, 2011; Umstattd, Meyer, Sharkey, Patterson, & Dean, 2013). Thus, sport programs should be as accessible as possible to allow for a maximum number of youths to take advantage of the offered program.

Olympic Wrestling

Olympic wrestling is an amateur combative sport that involves different grappling techniques. Its main objective is to throw an opponent and hold them down. Since 708 BC, Olympic wrestling has been a part of the Olympic Games and continues to be a highly competitive sport around the world. The sport of Olympic wrestling is free of many of the barriers that prevent youth from participating in sport, and requires little funding to create a program at a school (Kamble & Wangwad, 2015; Meier, 2015; Macro, Viveiros, & Cipriano, 2009; Pettersson, Pipping, & Berg, 2013; Silvey et al., 2016; Sisjord & Kristiansen, 2009). Although Olympic wrestling is an individual sport in competition, male and female wrestling teams train together on a regular basis, which can improve community cohesion leading to higher levels of mental health (Yip, Sarma, & Wilk, 2016; Zhu, Lee, & Mann, 2014). Olympic wrestling is a physical sport that requires a high level of physical fitness and thus can improve physical health in youth who may continue to participate in physical activity into their later years (Chimen et al., 2012; Meyer, & Gullotta, 2012; Smith, 2012). Olympic wrestling has been shown to be a highly accessible sport for youth and may have the potential to improve the physical and mental health of participants.

Problem Statement

Many new programs aimed at improving youth's physical and mental health have been implemented in Indigenous communities. However, many of these programs are not accessible to the majority of youth and are often "parachute" programs in which individuals come into the community, create a program that runs while they are in the community, but ends once the individuals leave. These programs do not follow the Indigenous methodologies laid out by Kovach (2009), Smith (1999), and Wilson (2008), in which it is stated that individuals form a long-term positive relationship with the Indigenous People before commencing a program and are used as a resource by the community to create something that is needed and wanted; and second, these types of programs do not lead to long-term sustainable programs for youth. Thus, programs accessible to the majority of youth, that have a plan of sustainability, and are conducted by individuals who have formed a positive and strong relationship within the Indigenous communities, should be examined to determine their impacts.

Purpose

Through a multiple methods approach, the purpose of my doctoral research is to study the impact of a youth Olympic wrestling program developed with, and implemented in, an Indigenous community.

Objectives

The objectives of the study are to:

1. Collaborate with an Indigenous community in the development and implementation of an Olympic wrestling program;
2. Measure the impacts of an Olympic wrestling program on the physical health of participating Indigenous youth;
3. Measure the impacts of an Olympic wrestling program on the mental health in participating Indigenous youth;
4. Assess the meaning and value of the Olympic wrestling program to participating youth after the completion of the program;
5. Explore the experiences of Indigenous youth who went beyond the program and participated in a high-level wrestling competition.

Thesis structure

This article-based thesis is structured as a collection of published and submitted manuscripts. More specifically it consists of a prologue, review of the current literature, six manuscripts, a discussion, interlude, and epilogue. Each manuscript is a stand-alone paper that has been published or is currently submitted for review. Thus, there is some overlap and repetition. The overlap and repetition exist to ensure that when readers read the published manuscripts individually they understand enough about the subject matter. Throughout this thesis, I use dual labels for each of these manuscripts: one in reference to the manuscript itself (Figure 1) and one as a chapter in the thesis.

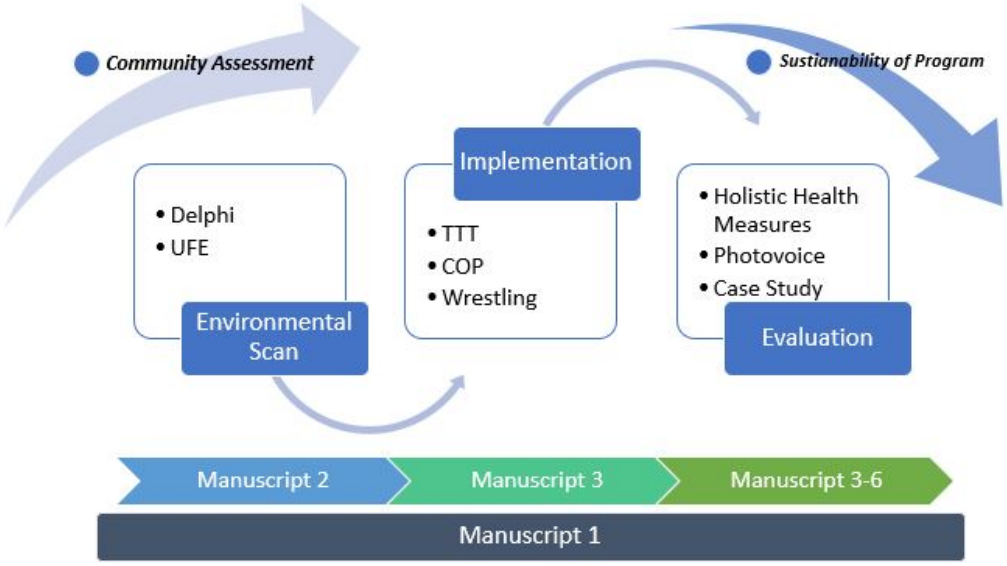

Figure 1. Visual representation of the process and stages of this dissertation and related manuscripts.

Figure 1 is a visual representation of how the manuscripts relate to each other, and how they relate to the thesis objectives. That is, in manuscript one I will discuss the methods used throughout the thesis. It relates to all of the objectives. In manuscript two, I will discuss the environmental scan conducted with the Indigenous community. It relates to pre-implementation, which is part of objective 1 (i.e. collaboration). How the program was built will be discussed in manuscript three. It will also examine the implementation and another part of objective 1. And finally, the evaluation of the program will be discussed throughout manuscripts three-six, with manuscript three and manuscript four addressing objective 2, manuscript 5 examining objective 3, and manuscript 6 examining objective 4. The discussion will address the overall knowledge gained throughout this thesis with reflections taking place in the prologue, interlude, and epilogue.

Definitions

Key definitions as they relate to this thesis specifically are presented below.

1. Physical Activity - any bodily movement produced by skeletal muscles that requires energy expenditure (Rachele, et al., 2014).

2. Sport - an activity involving physical activity in which an individual or team train to compete or compete against another ("Sport," 2019).

3. Indigenous Methodologies - taking relational accountability for the position of privilege a researcher has when working with an Indigenous community. Accepting that a non-Indigenous researcher is a resource for Indigenous communities to use as they see fit (Wilson, 2008).

4. Colonialism - the practice of believing that one group is superior to another. One group occupies the other's land and resources and attempts to assimilate or remove the other group ("Colonialism," 2019).

5. Utilization Focused Evaluation - an evaluation practice that puts the creation of the evaluation tool into the hands of the evaluators (Patton, 1997).

6. Train the Trainer - a practice used to train future trainers while they train others (Orfaly et al., 2005).

7. Community of Practice - a group of people that share a common interest in a sport.

8. Holistic Health - the Indigenous view of health that asserts that one's health is dependent on a combination of the physical, mental, emotional, and spiritual factors ("Holistic," 2019).

9. Community Cohesion - a sense of belonging in one's community through positive relationships built around trust, common vision, and caring (Yip et al., 2016).

10. Olympic Wrestling - the sport of amateur wrestling that is included in schools, clubs, university, and Olympic sport competitions.

Chapter 2: Review of the Literature

Introduction

Health programs, including sports programs, have been introduced in Indigenous communities across Canada to increase the quality of living for residents (Assembly of First Nations, 2005; Barnsley, 2006). Sports and physical activity programs have been shown to help improve non-Indigenous youths' physical and mental health through physical fitness, increases in self-esteem, and self-determination (Chimen et al., 2012; Larun, Nordheim, Ekeland, Hagen, & Heian, 2006; Meyer & Gullotta, 2012; Oh, Yoshino, Rana, Lee, & Hovatter, 2015; Rachele, Cuddihy, Washington, & McPhail, 2014; Sibold et al., 2015; Warner & Dixon, 2013). Many potential participants of the sports programs that are initiated currently in schools across Canada, including Indigenous communities encounter barriers (socioeconomic, gender, genetic, and physical fitness) that could prevent youth participation (Allender, Cowburn, & Foster, 2006; Blodgett et al., 2011; Gomes et al., 2011; Hardy, Kelly, Chapman, King, & Farrell, 2010; Sequeira et al., 2011; Umstattd et al., 2013). Therefore, the introduction of sports programs that do not create these barriers to participation and are fully inclusive could have a more positive effect on the health of participants. Olympic wrestling may be such a sport and will be examined as a highly accessible sport program (Kamble & Wangwad, 2015; Macro et al., 2009; Pettersson et al., 2013; Silvey, Benton, & Tatigian, 2016; Stevens, Butler, Cooke, & Everitt, 2006).

This chapter highlights the key themes identified from the literature and is organized into four parts. The first section will focus on the evidence describing

interventions that improve the mental and physical health of youth in general and Indigenous youth specifically. The benefits of sports on youth health will also be discussed in this section along with the barriers that impede participation and a sport that is more inclusive and limits these barriers will be discussed. The second section will delve into the social determinants of Indigenous health and how addressing the determinants are an important part of advancing health and wellness among this particular population. The third section will focus on evidence related to creating successful and sustainable sport programs. In the first manuscript, I include an in-depth examination of how the methods fit within an Indigenous framework. Literature related to methodology is subsequently explored within each manuscript. The fourth, and final section I will discuss and highlight research related to the evaluation of sport programs. It will highlight the paucity of research in combative sports, specifically Olympic wrestling, and the potential for combative sports to play an important role in improving Indigenous youth health.

Part 1: Improving the Mental Health of Youth

Studies of youth living in rural Indigenous and non-Indigenous areas have shown lower levels of mental health than their non-Indigenous counterparts living in urban areas (Alaghehbandan et al., 2005; Edwards et al., 2008; Hajizadeh et al., 2019; Kral, 2016; Kral et al., 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Richmond, 2009; Tousignant, Vitenti, & Morin, 2013). The high number of suicides in these communities is specifically linked to a poor level of mental health and has been shown to be related to several different social factors including: emotional trauma, lack of parental figure, family disruption, lack of access to social

support, and loss of identity (Kral, 2016; Kral et al., 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Paproski, 1997; Richmond, 2009; Tousignant et al., 2013). This is the case for Indigenous youth in the province of Newfoundland and Labrador, where suicide rates are three times higher than among the non-Indigenous population of Newfoundland (Alaghehbandan et al., 2005; Edwards et al., 2008; Hajizadeh et al., 2019; MacNeil, 2008). The disproportionately high rate of suicide among Canada's Indigenous and rural youth is a major area of concern in Newfoundland and Labrador.

The question then becomes, why do Indigenous youth in smaller, more remote communities, specifically Indigenous communities, have lower levels of mental health than their counterparts in urban cities? Several studies have shown that a lack of access to early childhood development programs, poor housing, a lack of youth programing, and the effects of colonialism such as loss of cultural identity created through oppression and cultural genocide are the major causes of low levels of mental health in Indigenous youth (Kral, 2016; Kral et al., 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Richmond, 2009; Tousignant et al., 2013). Thus, in order to work towards improvements in mental health, interventions should consider these different barriers.

Proactive approaches that aim to improve Indigenous and non-Indigenous youth mental health in schools consist of mental health literacy programs and physical activity promotion (School-based mental health in Canada: A final report, 2013; Stewart, Riecken, Scott, Tanaka, & Riecken, 2008.). First, mental health literacy instructs youth on the knowledge and skills that address the biological,

psychological, and social aspects of mental health that can lead to increased youth understanding, reduced stigma, recognition and prevention of further mental disorders, and facilitation of help-seeking behavior towards mental health care (Wei & Kutcher, 2012; Wei, Kutcher, & Szumilas, 2011). Mental health literacy programs focus on one of two areas, prevention of mental health disorders through the increase of self-esteem, or social coping skills, or in the area of addressing specific health disorders including recognizing signs or symptoms (Corrigan & Kleinlein, 2005; Crisp, 2003; Kelly, Jorm, & Wright, 2007; Sartorius & Schulze, 2005). Although many school bodies around the world believe that mental health literacy programs are effective and have implemented them into classroom teachings, there is conflicting evidence to support the notion of positive association between mental health literacy programs and higher levels of mental health among youth between the ages of 12-19 years (Kelly et al., 2007; Wei et al., 2013).

Physical activity is a form of play and has been shown to have numerous health benefits. It fosters the development of healthy muscles, bones, and joints, and increasing strength and endurance. Physical activity is attributed to reducing the risk of coronary heart disease and stroke, reducing diabetes, preventing site specific cancers (such as colon, breast and lung cancer), combating osteoporosis, protecting against obesity, and assisting in weight control (Chimen et al., 2012; Desapriya, 2006; Meyer & Gullotta, 2012; Smith et al., 2012). Physical activity has also shown to have social benefits such as providing opportunities for people to develop social networks; being a vehicle for community engagement; building relationships with community members; allowing individuals to take part in society in order to feel

that they are a valued and respected members of the community; and reducing social isolation, loneliness, and alienation (Hudson, Spence, & McHugh, 2019; Forsyth, 2014; McHugh et al., 2015; Richards, Foster, Townsend, & Bauman, 2014). Mental health benefits are also gained from physical activity by increasing levels of physical self-concept, self-confidence, motivation, positive thinking, and the ability to deal with stressful situations. Benefits also include lowering psychosomatic complaints, and preventing depression, which can lead to suicidal thoughts and suicide (Larun et al., 2006; Oh et al., 2015; Rachele, et al., 2014; Sibold et al., 2015; Warner & Dixon, 2013).

Why Youth Choose not to Participate in Physical Activity and Sport

Currently, physical education is offered in all school systems (both public and private) in Canada and the majority of schools have physical activity programs after classes and on weekends (Guèvremont, Findlay, & Kohen, 2014). Many community centres throughout Canada have sport and physical activity programs as well. These offerings provide ample opportunity to participate in physical activity at school and in the community. However, many students choose not to, or are unable, to be a part of the programs offered (Copeland, Sherman, Kendeigh, Saelens, & Kalkwarf, 2012, and 2009). The inability to participate prevents these youth from gaining the benefits from physical activity.

In the review of the literature, four key barriers were identified that prevent both Indigenous and non-Indigenous youth from participating in physical activity and sport programs offered in their areas: socioeconomic, gender, genetic, and fitness level barriers (Allender et al., 2006; Brittain, Jones, & Rikli, 2002; Gomes et

al., 2011; Hardy et al., 2010; Johnstone & Millar 2012; Kirby, Lévesque, & Wabano 2007; McHugh, 2011; Oliver & Hamzeh, 2010; Robbins, Sikorskii, Hamel, Wu, & Wilbur, 2009; Sequeira et al., 2011; Skinner, Hanning, & Leonard, 2006; Sørensen & Gill, 2005; Umstattd et al., 2013).

Socioeconomic Barrier

Cost often prohibits parents from being able to allow their children to participate in sports (Allender et al., 2006; Gomes et al., 2011; Hardy et al., 2010; Kirby, Lévesque, & Wabano 2007; Sequeira et al., 2011; Skinner et al., 2006; Umstattd et al., 2013). Some popular sports, like hockey, can cost upwards of $4000 per season. Just the cost of equipment is a barrier to Canada's most popular sport and this does not include registration fees and travel costs. Physical activity program organizers often lack creative ideas about how to involve individuals from low-income families, s (Gomes et al., 2011; Sequeira et al., 2011). Low-income families often do not have the time to be a part of physical activity and sports programs in their communities. Also, most programs are not conducted on a "drop in" basis, so parents of low-income families must pay a large registration fee, even if their child may not be able to attend regularly. Children also have fear of being teased due to the type of clothes they wear to play some sports (not having the right shoes, etc.), and this may lead them to stop participating (Copeland et al., 2009). Indigenous youth specifically have shown that the cost of sports can limit them from participating (Kirby, Lévesque, & Wabano 2007; McHugh, 2011; Skinner et al., 2006).

Gender Barrier

Many sports are often labeled as male or female–oriented. For example, the majority of participants see football as a male-dominated sport. Females are often not allowed to play with the males for fear of someone getting injured – specifically a female. Young females can also be seen as "butch" (having masculine qualities) for participating in male-dominated sports and the reverse can be true for young males who participate in female-dominated sports (Allender et al., 2006; Kirby, Lévesque, & Wabano 2007; Shaw, Kleiber, & Caldwell, 1995). Lastly, studies have shown that many young females are bored with the sports that are offered in their schools (Allender et al., 2006). If sports other than the norm were offered girls may be more interested in participating (Flintoff & Scraton 2001). By labeling sports as male or female, this limits access to physical activity for youth (Brittain, Jones, & Rikli, 2002; Fasting & Sisjord, 1985; Johnstone & Millar 2012; Oliver & Hamzeh, 2010; Robbins, Sikorskii, Hamel, Wu, & Wilbur, 2009; Sequeira et al., 2011; Sørensen & Gill, 2005; Trost et al., 1996).

Genetic Barrier

Popular high school sports and physical activities have a high genetic component/factor. Having a height over 5'10 has been shown to give participants an advantage in volleyball, basketball, and soccer (Krüger, Pilat, Ückert, Frech, & Mooren, 2014; Malina, Eisenmann, Cumming, Ribeiro, & Aroso, 2004). If youth are taller, they will perform better than their shorter peers. Several studies have shown that if someone performs well in a sport the first time that they participate, they are

more likely to continue playing (Gonçalves, Rama, & Figueiredo, 2012; Lippi, Longo, & Maffulli, 2010). This applies in other physical activities as well (Kansal, 2010). The more skilled youth appear to be in a sport, the more likely they are to continue to participate and gain the benefits of physical activity (Baker, & Logan, 2007). In addition to genetics, age is also a factor. If an individual is born earlier in the year, they are likely to be taller and stronger than their classmates, and would therefore excel more in physical activities (Parent-Harvey, Desjardins, & Harvey, 2014). Having an early birthdate can affect how interested in physical activity an individual will be. If a youth is taller and stronger, he/she will perform better than his/her peers and will therefore be more interested in participating in sports more often.

Fitness Level Barrier

An individual's level of fitness or how he/she perceive his/her level of fitness prior to participating in physical activity can affect whether or not he/she participate in sport (Allender et al., 2006; Brittain et al., 2002; Gomes et al., 2011). Many youths want to participate in sports, but cannot due to low levels of fitness. Youth with lower fitness levels cannot keep up with their fitter peers, or may feel the uniforms are not flattering. They are more likely to feel self-conscious and may quit participating (Allender et al., 2006). Youth may also choose not to participate because of ridicule and bullying from others who may be focused solely on winning and do not want individuals on their team who hinder the chances of victory (Baillie et al., 2016). This treatment can create feelings of inadequacy in the unfit youth and

may actually adversely affect mental health rather than improve it (Allender et al., 2006; Brittain et al., 2002; Gomes et al., 2011).

Advocating for Accessible Sport

Advocating for accessible sports that address barriers to youth participation is necessary. One possible sport that has had minimal attention in the literature is combative sports, specifically the sport of wrestling. It has been argued that the implementation of Olympic wrestling into after-school high school programing and physical education curriculums across Canada could increase youth participation (Kamble & Wangwad, 2015; Meier, 2015 Macro et al., 2009; Silvey et al., 2016; Stevens et al., 2006). The following section identifies how wrestling could play an important role in youth development.

Socioeconomic Barriers

Income disparities have been shown to exist between Indigenous families and non-Indigenous Canadians. Any program that alleviates the financial burden placed on these families will allow for a larger number of physical activity participants (Pendakur & Pendakur, 2011; Reading and Wein, 2013). Olympic wrestling is a sport that presents few socioeconomic barriers (Kamble & Wangwad, 2015). Youth are not required to purchase any equipment as they can wrestle in any outfit they find to be comfortable. There is no specific footwear and the singlets that are worn in the Olympics are not mandatory for youth competitions. The only piece of equipment required is a set of foam mats, which many schools across Canada were given in the 1970's and 1980's by school boards. For those that were not,

Wrestling Canada has recently started a funding program to help communities acquire a set of mats at no cost (wrestling.ca).

Gender Barrier

Gender barriers are limited in Olympic wrestling (Macro et al., 2009). During practices, boys and girls wrestle each other in a gender-mixed environment (Macro et al., 2009; Sisjord & Kristiansen, 2009). At competitions, girls and boys are separated, but still work as a team to help one another succeed with coaching and peer support. Many people believe Olympic wrestling is a male dominated sport. However, Canada currently has the best women's Olympic wrestling team in the world. At present 1/3 of high school wrestlers are female (BC Wrestling Association, 2018; Macro et al., 2009). Having Canadian women of such a high skill level creates role models, which, in turn, has been shown to increase the participation of female youth (Meier, 2015).

Genetic Barrier

One of the most equalizing components of Olympic wrestling is its use of weight classes. By having wrestlers compete with others of the same weight, genetic barriers are limited. If an individual is taller, they will either wrestle other tall individuals or shorter individuals who are likely stronger. Weight classes can make Olympic wrestling fair. It is not the size of a participant that leads to victory, but how well they wrestle (Pettersson et al., 2013). Many sports force youth to compete against other youth who have the advantages of size; however, weight classes are

aimed at limiting how often this occurs in Olympic wrestling. Recently, weight classes have received much criticism. Under current Wrestling Canada regulations, youth are not allowed to lose high amounts of weight in a short time to fit into a specific weight class (cut weight). Instead, as of 2018 youth weigh in the day of competition (Wrestling Canada, 2018). Wrestling Canada's goal in these regulations is to make Olympic wrestling a positive experience for all those who participate.

Fitness Level Barrier

Olympic wrestling is a team sport in practice – all individuals train and work together to improve – but compete individually. Olympic wrestling matches occur on a one-on-one basis so there is little pressure to succeed for the team. There are team competitions, however, high school competitions in Canada are almost always individual competitions. "Dual meets" (team competitions) usually only happen at the university or Canada Games level. Participants who start out with a low fitness level can take their time to improve without having other members of the team pressure them to keep going for the good of the team (Stevens et al., 2006). This allows the youth time to increase their level of fitness without hurting their confidence and also allows them to participate, as they feel comfortable. Having the opportunity to participate in more individual sports could allow for more Indigenous youth to participate.

Accessibility

Olympic wrestling can give participants all the added benefits of being physically active by limiting the barriers previously discussed in this paper, (Kamble & Wangwad, 2015; Meier, 2015; Macro et al., 2009; Pettersson et al., 2013; Silvey et al., 2016; Sisjord & Kristiansen, 2009; Stevens et al., 2006). Facilities such as school gyms and community centres with equipment for Olympic wrestling exist across Canada and Olympic wrestling is in the provincial high school curriculum. However, one barrier that still exists in Olympic wrestling is that there are few programs in operation because only a handful of individuals have the proper training to coach.

Another barrier to an Olympic wrestling program is a parent not wanting to allow their children to participate in what they may consider to be dangerous physical activity. As Olympic wrestling is a combat sport, it is often seen as violent and/or dangerous with a high likelihood of injury. On the contrary, studies show that out of all of the sports offered in high schools, Olympic wrestling has some of the fewest injuries (Caswell et al., 2017; Hootman, Dick, & Agel, 2007; Nelson Collins, Yard, Fields, & Comstock, 2007; Rechel, Yard, & Comstock, 2008). Caswell et al., (2017) show that the highest rate of injury occurs in girls' basketball with 39.4 injuries per 1000 athletes. Wrestling has 28.7 per 1000 in middle school sports. Rechel et al. (2008) find that in high school sports, football had the highest number of injuries and concussions (12.09 per 1000) of all high school sports. They also determine that boys' soccer (7.74 per 1000) and girls' basketball (6.03 per 1000) have the highest number of head, face, and neck injuries and the second highest number of concussions. Even baseball and softball (3.47 per 1000) have more injuries in competition than Olympic wrestling (2.04 per 1000) due to the repetitive

motion of throwing a ball with the same arm. These facts alone suggest that Olympic wrestling is extremely safe as compared with other sports that are the standard and most often offered sports in public school across Canada.

Indigenous Sport

Sports and physical activity in Indigenous cultures have been around for centuries (Forsyth & Giles, 2012). For example, Indigenous Peoples of Canada and the United States of America created and played lacrosse starting around the 17th century (Downey, 2018; Dubnewick, Hooper, Spence, & McHugh, 2018; Pietramala, Grauer, & Scott, 2006). These massive games of lacrosse consisted of hundreds of participants, played over several kilometers of field and lasted for days (Downey, 2018). Various forms of traditional sports such as 2-feet high kick and leg wrestling were a big part of Indigenous People's lives (Hall, 2013; Heine, 2013). Many of these traditional games were used to keep community members physically fit during the long winter months. The games were often designed around hunting and life on the land. They emphasized endurance, strength, and agility (Hall, 2013). Not only did the games increase physical health but they also worked to create a sense of community among members, increasing cohesion and leading to improved levels of mental health (Hall, 2013). Indigenous Peoples of Canada particularly Inuit who live in the far north with limited daylight hours during the winter months held regular sport events to keep the community members fit and to improve mental health (Dubnewick et al., 2018; Forsyth & Giles, 2012).

The North American Indigenous Games (NAIG) is a major sport event that occurs in either Canada or the United States of America every three years (the next one will be held in Halifax 2020). The games consist entirely of Indigenous youth participants and mostly Indigenous coaches who participate in sports such as basketball, baseball, volleyball, wrestling, and track. First held in 1990, the vision of NAIG is:

> To improve the quality of life for Indigenous Peoples by supporting self-determined sports and cultural activities which encourage equal access to participation in the social / cultural / spiritual fabric of the community in which they reside and which respects Indigenous distinctiveness (The Vision of the NAIG, n.d., para. 1).

NAIG along with other sporting events, sports, and physical activities have been a part of Indigenous Peoples' lives for centuries. Although sport and physical activity have been a part of Indigenous history for centuries, Foulds, Warburton, and Bredin (2013) show that the majority of Indigenous Peoples in North America are not getting enough physical activity to meet national guidelines.

Four years ago, to address the impacts and legacy of residential schools and colonialism, the Truth and Reconciliation Commission (Truth and Reconciliation Commission, 2015) of Canada published 94 Calls to Action. Five of these Calls to Action (Appendix 6) directly address sport and the importance that sport holds in reconciliation, along with a call to "[ensure] that policies to promote physical

activity as a fundamental element of health and well-being, reduce barriers to sports participation, increase the pursuit of excellence in sport, and build capacity in the Canadian sport system, are inclusive of Aboriginal peoples" (Truth and Reconciliation Commission, 2015 p. 10). Use of sport and physical activity to maintain and improve health is not a novel idea within Indigenous communities across Canada and could be viewed as a positive means to improve and maintain higher levels of mental and physical health among their people.

Summary

Youth suicide and low levels of mental health in Indigenous and rural communities in Newfoundland and Labrador are a concern for both the provincial, and Canadian governments, along with the Indigenous governing bodies (Pollock, Mulay, Valcour, & Jong, 2016; Truth and Reconciliation Act, 2015). The proactive approach of using physical activity via an Olympic wrestling program could improve mental health leading to the prevention of depression before it begins (Kamble & Wangwad, 2015; Larun et al., 2006; Meier, 2015; Macro et al., 2009; Pettersson et al., 2013; Silvey et al., 2016; Sisjord & Kristiansen, 2009; Stevens et al., 2006). Improving youth mental health and preventing suicide may save the government millions of dollars in treatment each year (Häußler, 2014; Janssen, 2012; King, 2012; Zapata-Diomedi, Herrera, & Veerman, 2016). Having programs that work to increase levels of mental health (kids help phone, counseling centres) in action at the same time as offering accessible physical activities would allow governments to improve youth mental health from two fronts: give treatment to youth who already suffer

from depression and prevent more youth from entering a state of depression. Creating more physical activity options will allow more youth to participate, which could lead to more parents and community members contributing and enjoying the benefits of community cohesion (Cradock, Kawachi, Colditz, Gortmaker, & Buka, 2009; Yip et al., 2016; Zhu, Lee, & Mann, 2014). Both physical activity and community cohesion could lead to an increase in mental health for both youth and adults. The increase could also contribute to the success of these youth as adults who will have children of their own and thereby establish a positive cycle that will continue to benefit Newfoundland and Labrador and Canada for generations.

There are many different paths and programs that could work towards increasing the mental health of Indigenous youth, from arts to sports, and within sports from chess to wrestling. What have been investigated here are the contributions that Olympic wrestling could have on the health of Indigenous youth. More specifically, introducing an Olympic wrestling program to an Indigenous community while working with the community could increase youth physical and mental health due to its gender neutrality, affordability, weight classes, and team atmosphere.

Part 2: Social Determinants of Indigenous Health

A clear understanding of the specific social determinants of Indigenous health is vital to introducing a program to ensure that past harms are not replicated. As with any population, social determinants influence the health status of Indigenous individuals and groups. Deficits in these determinants lead to health inequities between Indigenous and non-Indigenous Canadians (Lines, Jardine, &

Yellowknives Dene First Nation Wellness Division, 2019). As will be explained, a program must address these underlying inequities in order to work towards improving Indigenous People's health. However, in order to address and understand the social determinants of Indigenous health, individuals must first understand the Indigenous' view.

Indigenous Views of Health and Wellbeing

Indigenous views on health and wellbeing differ significantly from western/European views on health (Howell, Auger, Gomes, Brown, & Leon, 2016). The western/European view on health mostly focuses on disease and infirmity, whereas the Indigenous health model is holistic, examining four dimensions of health: physical, mental, emotional, and spiritual (Martin Hill 2009, McCabe, 2007). Western/European patients are seen as passive in how they receive treatment once they become ill (a retroactive view): visit a doctor, receive medication, and take the medication (Adelson, 2005). Indigenous Peoples view health as proactive: a lived wellness so to speak that extends past oneself and encompasses an individual's family, community, environment and ancestors, and the relationships held with each (Howell et al., 2016). If these relationships are not strong and/or healthy the wellbeing of an individual could be at risk.

This general view extends to many Indigenous Peoples. It is important to acknowledge that perceptions of health are also distinct among Indigenous Peoples. The medicines used are as different as the lands on which each group live (Wenger-Nabigon, 2010). This would seem obvious, as a variety of areas in the world have different plants and animals with distinct medicinal properties. The knowledge

passed from one generation to the next tends to be localized among each people. Generally speaking, Indigenous People do not strive for generalizability of medicinal applicability as what western/European medical practitioners search for. Instead, the medicine is localized to where it exists: just because it works in one place, does not mean it will work in others (Battiste & Henderson, 2000).

The medicine wheel is a symbol used by First Nations People of Canada to represent the interconnectivity of the four parts of holistic health: physical, mental, emotional, and spiritual. Indigenous beliefs exist within the paradigm that all things are interconnected (Doucette, Bernard, Simon, & Knockwood, 2004; Wenger-Nabigon, 2010). The medicine wheel not only represents the health of the individual but also represents the four cycles of nature (seasons), the four kingdoms (animal, mineral, plant, and human), the four sacred medicines (sweetgrass, tobacco, cedar, and sage), the four parts to the path of healing (recovery, recognition, restitution, reconciliation), and final the four stages of life (birth, growth, adulthood, death) (Doucette et al., 2004; Wenger-Nabigon, 2010).

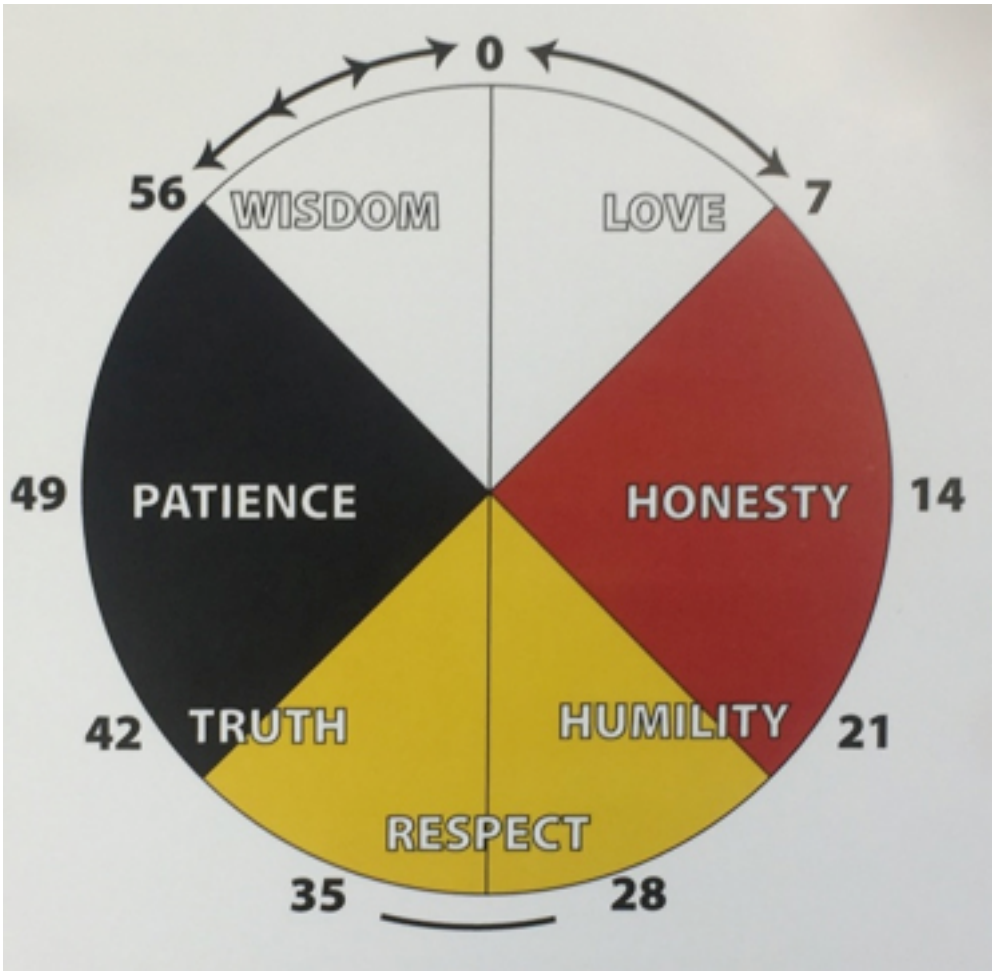

Figure 2. The Mi'kmaq Medicine Wheel (Mi'kmaq Sacred Teachings, n.d.).

Like the views of Indigenous Peoples, each medicine wheel is different and has unique characteristics. Figure 2 is an illustration of the Mi'kmaq people's medicine wheel. Each color represents a different time and place: white is the color for Elders and children under the age of seven years representing North and mental wellbeing; red is the colour seen during the rising sun representing East and spiritual wellbeing; yellow is the colour of renewed life representing South and emotional wellbeing; and black is the colour of the spiritual world and the night, representing the west and physical wellbeing (Mi'kmaq Sacred Teaching, n.d; J. Wetzel, personal communication, July 22, 2017). The numbers along the wheel present the years of a person growing and how they grow through the world with

significant changes happening every seven years. Each of the words – love, honesty, humility, respect, truth, patience, and wisdom - on the wheel demonstrates how people grow and learn throughout their lifetime. It is interesting to note that the arrows towards seven go back and forth. This is to represent the Elders' beliefs that people can go back to the age of seven through Apaji-mijua'ji'juen or Alzheimer's disease (Mi'kmaq Sacred Teaching, n.d).

A summary of Doucette et al.'s (2004) description of how each of the four quadrants of the medicine wheel interacts follows. Think of a person who is asked to do something of high moral value. They examine their own values and beliefs (spiritual – East); they then contemplate what they should do based on these beliefs (mental –North); then they carry out their decision (physical - West). This decision will have an overall impact on how they feel in the future (emotional - South). This is a simple way to demonstrate how each of the four quadrants of the medicine wheel influences each other. To examine this further, if a person does not believe in themselves, is not in a positive frame of mind, or places little value on their life, they are less likely to make decisions that will lead them to doing things to improve their lives and the lives of people around them and thus lead them to suffer emotionally. This emotional trauma will cycle back to cause mental, spiritual and physical suffering, which will continue the cycle of suffering (Doucette et al., 2004).

The medicine wheel is a framework used to examine some of Indigenous Peoples' views on health. It demonstrates how the four areas of wellbeing are interconnected and how they influence each other. This framework can help researchers and health practitioners understand how the relationship people have

with the world around them influences their health. Thus, the social determinants of health, specifically that of Indigenous health, have an extremely high amount of leverage over the health of Indigenous Peoples throughout Canada.

Social Determinants of Indigenous health

The health of Indigenous Peoples is impacted by social determinants. These determinants affect the physical emotional and spiritual health of Indigenous adults and youth (Adelson, 2005; Waldram, Herring, & Young, 2006; Wilson & Rosenbery, 2003). Loppie and Wien (2009) frame the social determinants of health into three main categories: distal – political, social, economic contexts; intermediate – community, infrastructure; and proximal – health behaviors, physical and social environments. These three sections will be discussed in further detail.

Proximal determinants of health are determinants that directly affect the individual in their home or community. These determinants prevent Indigenous individuals from meeting basic survival needs but also can generate health problems (Reading & Wein, 2009).

Education

Indigenous youth living in Indigenous communities have a much lower likelihood of completing high school than non-Indigenous Canadians – on average 40% do not finish (Cardinal, 2004; Smylie, Williams, & Cooper, 2006; Statistics Canada, 2013). Data suggests that 59% of Indigenous People living outside of their Indigenous communities in Alberta did not complete high school while 48% living in

their Indigenous comminutes did (Statistics Canada, 2013). Indigenous youth who do complete high school are less likely than non-Indigenous Canadian youth to move on to higher education (Kolahdooz, Nader, Yi, & Sharma, 2015). This can limit job opportunities for Indigenous youth and as employment has been shown to be the second most influential social determinant of health this could have adverse effects on the health of these individuals (Coryse & Scott, 2006; Kolahdooz et al., 2015; McEwen, 2006; Smylie et al., 2006).

Employment/Income

There are fewer job opportunities in Indigenous communities and the jobs that do exist often pay less than those offered in non-Indigenous communities (Task Force on Indigenous Languages and Cultures, 2005). Many Indigenous People often leave their home communities in hope of finding better paying jobs, but often face high degrees of racism which can prevent them from gaining fair employment (Galabuzi, 2004). Lack of income can prevent Indigenous individuals from accessing adequate nutrition, housing, and personal resources which in turn influence psychosocial factors such as social cohesion. These problems can lead to poor physical health, increased crime rates, anxiety, insecurity, low self-esteem, and general feelings of hopelessness (Chandler, Sokol, & Hallett, 2003; Iwasaki, Bartlett, & O'Neil, 2005; Iwasaki, Bartlett, & O'Neil 2004; McEwan, 2007; McEwan, 2006; Pendakur & Pendakur, 2011).

Housing

There are many issues with housing in Indigenous communities. Problems stem from a lack of efficient design which is not appropriate for the climate. Homes are often built from substandard materials requiring much more serious maintenance than those of Canadian non-Indigenous communities (Berghout et al., 2005; Loppie & Wein, 2009; Reading and Wein, 2013). For example, 49% of homes in Nunavut are below the Canadian housing standard (Knötsch, Kinnon, Canadian & National Aboriginal Health Organization, 2011) These poorly maintained homes can lead to serious respiratory health issues caused by mold and mildew and may lead to other health issues from poor insulation or lack of heating (Knötsch et al., 2011; Lawrence & Martin, 2001). Another major problem seen regularly in homes in northern Inuit communities is overcrowding. Many families or multiple generations often all live in a single domicile which can lead to lack of attention for some youth along with a lack of personal space for all inhabitants. Consultations suggest that the lack of personal space may lead to attention deficits disorders among children. Crowding conditions prohibit parental space away from the children which can lead them to find escape through the use of alcohol or drugs (Assembly of First Nations, 2007; Canada Mortgage and Housing Corporation, 2004; Knötsch et al., 2011). Overcrowding has also been linked to health outcomes such as increase in infectious diseases, respiratory tract infections, mental health problems and family tensions (Knötsch et al., 2011).

Food Insecurity

This is the last of the proximal determinants of health. Due to the remoteness of many Indigenous communities, healthy foods and a variety of foods is often hard to find in the communities. The foods often need to be shipped long distances and thus are more expensive and have a shorter shelf life (Lambden, Receveur, Marshall, & Kuhnlein, 2006; Tarasuk, Fafard St-Germain, & Mitchell, 2019). This can impair access to nutritious food in many Indigenous communities and can lead to nutritional deficiencies, obesity, distress and depression (Tarasuk el al., 2019)

As is noted in the above paragraphs the proximal determinants of Indigenous health are at the individual level (Loppie & Wien, 2009). Any deficiency in education, employment/income, housing, or food security will have a direct effect on the health outcomes of any individual and can extend to their family. The blame for these issues is often placed on the individual in North America, rather than the state and thus makes it harder for improvements to occur. Lastly, all of the above are interrelated. For example, if a youth cannot sleep due to overcrowding in his/her home he/she will not be able to perform well in the classroom. Poor performance may lead to the student dropping out and having a more difficult time getting a job. This unemployment can lead to food insecurity. In addition, the health impacts of any one individual determinant may negatively influence the other determinants. All of these issues need to be addressed and are all of equal importance (Loppie & Wien, 2009).

Intermediate Determinants of Indigenous health have more to do with the community and an individual's relationship with their community and environment. Intermediate determinants therefore are the origins of the proximal determinants of Indigenous Health (Loppie & Wein, 2009).

Access to Health Care

Access to health care is a major social determinant of health around the world (Health Canada, 2007). Without access to health care many individuals cannot address basic health issues which can later lead to future and more serious health problems (lack of ability to get a vaccine is a good example). When asked why many Indigenous People do not have access to health care three main reasons are given:

Transportation Often the nearest health service is a considerable distance from an Indigenous community. Many individuals do not have cars and public transportation is lacking in the majority of Indigenous communities (Archibald & Grey, 2006).

Availability of Local physician Very few Indigenous communities have an onsite physician. This forces individuals to often travel several hours to the nearest health care service provider and is complicated by the lack of transport (Archibald & Grey, 2006).

Culturally Inappropriate Service: As already stated, Indigenous People view health in a holistic way: physical, mental, and spiritual (Nelson & Wilson, 2018; Webster, 2018). This holistic approach is an important part of their culture and how they view health. When health services do not approach an Indigenous person's

health in this way they can often come across as offensive to Indigenous Peoples. When asked, many individuals suggest they would not see a physician due to the fact that the physician does not address all aspects of health (Archibald & Grey, 2006; Assembly of First Nations, 2005; Nelson and Wilson, 2018; Webster, 2018).

Community Infrastructure

What the community has to offer to the people structurally is vital. Community centres bring together individuals, which can increase community cohesion and also can be used for activities (physical – sports etc., mental – activities for youth and adults to interact) that can lead to increasing in health and wellbeing. Many Indigenous communities lack this vital infrastructure, leading to lower levels of community involvement. The repercussions of this situation will be discussed in the next point (Mendelson, 2004; Senecal, 2007).

Cultural Continuity

Auger, Psych, and Gomes (2016) discuss cultural continuity as the way in which traditional knowledge is integrated into people's culture and methods, and how this is passed on and maintained. Chandler and Lalonde (1998) show that in communities where there is less cultural continuity there are higher numbers of suicides. They also discuss how cultural continuity is severely damaged by the loss of cultural identity that Indigenous People in Canada have suffered. The loss of their traditional lands and their language negatively impacts their mental health and continues to have long-term effects on these people. Cultural continuity also relates

to empowerment of the individual and how they support each other within their community (Chandler & Lalonde, 2008). Studies show that increasing the number of people that speak their traditional languages leads to enhanced cultural continuity, which leads to an improvement in mental health and can have an impact on lowering rates of suicide (Hallet, Chandler, & Lalonde, 2007; Loopie & Wein, 2009).

Environmental Stewardship

As mentioned above, the loss and destruction of Indigenous traditional lands continues to have a severe impact on the mental and physical health of Indigenous People (Assembly of First Nation, 2006). A relationship with the environment is vital to the culture of almost all Indigenous People and this relationship has been damaged by land destruction and relocation (Assembly of First Nation, 2006). Lack of environmental relationship has contributed to depression and malnutrition in both Indigenous youth and adults due to the inability for Indigenous People to hunt for their traditional foods (Lines et al., 2019).

Distal Determinants of Indigenous health are those that have been inflicted upon Indigenous Peoples and may have the strongest influence on the Indigenous health. They represent the political, economic, and social contexts that contribute to the intermediate and proximal determinants (Loppie & Wein, 2009).

Colonialism

John A. McDonald, Canada's first Prime Minister made the decision that Canadian's needed to assimilate Indigenous People into "white Canada" (Galabuzi, 2004). This forced assimilation, consisted of the removal of lands, forced reserves, and residential schools, which has led to social, political, and economic inequalities (Loppie & Wien, 2009). These inequalities are linked to the intermediate and distal determinants that have been previously discussed that can lead to serious mental and physical issues (lack of nutritious diet, depression, alcohol and drug abuse, respiratory diseases, lack of empowerment, addiction disorders, lack of education, etc.) identified as the proximal determinants (Loppie & Wien 2009; Truth and Reconciliation Act, 2015).

The loss of traditional lands prevented Indigenous Peoples from being able to hunt, trap, or fish in order to sustain themselves (Wilson & Rosenberg, 2003). This inability for Indigenous People to be able to sustain themselves reinforced by the loss of cultural identity that the Indigenous Peoples suffered under the Canadian government through residential schools continues to contribute to a loss of a sense of empowerment. The schools were a form of genocide that destroyed the culture, language, and community networks of Indigenous communities in Canada (Assembly of First Nations, 1994; Indian residential school survivors society, 2006; Loppie & Wien, 2009). Not only was the loss of culture and family a result of residential schools, but the psychological damage created by abuses that occurred there, have gone on to affect ensuing generations even those who did not attend the schools through trans-generational trauma (Kirmayer, Simposn, & Cargo, 2003;

Loppie & Wien, 2009). Thus, these schools did not only damage the physical and mental health of the survivors but also their children and their children's children.

Racism

Indigenous People in Canada are faced with significant prejudice. It prevents them from improving their education levels, gaining higher paying employment, and even living in certain neighborhoods (Galabuzi, 2004). Racism is a by-product of colonialism and has continued since the founding of Canada, creating a social stratification that has controlled the distribution of resources, power, freedom, and personal control for the Indigenous Peoples of Canada. This has negatively impacted the physical and mental health of Canada's Indigenous Peoples since the arrival of Europeans to North America (Barnsley, 2006; Stephens, Porter, Nettleton, & Willis, 2006). Research has also shown that racial prejudice can cause negative health outcomes and lead to unhealthy behaviors such as increases in drug and alcohol use (Paradies, 2016; Williams & Mohammed, 2009; Ziersch, Gallaher, Baum, & Bentley, 2011)

Indigenous Peoples of Canada also experience structural racism. Structural racism is the reinforcement of inequities among racial and ethnic groups through macro-level systems, social forces, institutions, ideologies, and processes that interact with one another (Powell, 2008). Forcing Indigenous youth to attend residential schools where they were taught that their culture was wrong and that they were "less than" has had long term impacts on the socioeconomic status, health, education, and political inequalities of Indigenous Peoples (Juutilainen, Miller,

Heikkila, & Rautio, 2014). Racism continues as federal government school funding is lower in Indigenous communities as compared to non-Indigenous communities in Canada, health care via facilities and trained professionals is lacking in many Indigenous communities, and government representation from Indigenous communities is lacking in Canada (Anaya, 2015; Vogel, 2016).

Self-Determination.

Self-determination has been shown to be most important among Indigenous Peoples (Boyer, 2006; Madden, Graham, & Wilson, 2005). Self-Determination can be viewed in two ways: 1) the process by which a country/group determines its own identity and forms its own allegiances and governing body, and 2) the process by which a person controls his/her own life. When viewed through the lens of an individual, self-determination influences the success rate of individuals in achieving education, income, employment, housing, and health (Boyer, 2006; Loppie & Wein, 2009; Madden et al., 2005). Indigenous Peoples are given little say over their lands, economy, education and health services due to colonialism (Loppie & Wien, 2009).

Lack of power and control can lower feelings of self-worth. Indigenous individuals start to feel that their choices are out of their hands and they have no say in what is to come (Loppie & Wein, 2009). Lack of self-determination can lead to high levels of depression, substance abuse, and suicide (Boyer, 2006; Loppie & Wein, 2009).

Summary

Increases in physical activity levels have been shown to lead to improvements in education performance (school attendance and academic achievements), and self-determination. Improvement in school performance can also lead to individuals attending post-secondary institutions (Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Hansen, Pritchard, Melnic, & Zhang, 2016; Pellicer-Chenoll et al., 2015; Singh, Uijtdewilligen, Twisk, van Mechelen, & Chinapaw, 2012). Several studies show that increases in physical activity, specifically from sport can lead to increased self-efficacy which could lead to higher levels of self-determination resulting in better health (Chimen et al., 2012; Desapriya, 2006; Oh et al., 2015; Rachele et al., 2014). Sport has been shown to improve community cohesion and through this community cohesion via competition or training, increase levels of camaraderie and support among athletes and coaches (Cradock et al., 2009; O'leary & Khoo 2013; Yip et al., 2016; Zhu et al., 2014). Sport and physical activity may be one factor that can aid in increasing the quality of life of Indigenous youth in Canada.

This section also has discussed the important role that the social determinants of health have on the physical and mental health of Indigenous Peoples. It has shown that there are multiple factors that must be addressed when working with Indigenous Peoples (youth and adults), including the consequences of colonialism. A different approach is required when working with Indigenous Peoples and their communities rather than non-Indigenous participants.

Part 3: Developing Sports Programs with Indigenous Communities

To summarize the previous sections of this paper it has been shown that there is a greater risk of self-harm and suicide among Indigenous youth in Canada compared to their non-Indigenous peers (Alaghehbandan et al., 2005; Edwards et al., 2008; Hajizadeh, Bombay, Asada, 2019; Kral, 2016; Kral et al., 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Pigford & Willows, 2010; Richmond, 2009; Tousignant, Vitenti, & Morin, 2013). Coupled with the typical stressors accompanying adolescence, there are additional factors that may increase the vulnerability of Indigenous youth to suicide and attempted suicide. These factors include cultural displacement, geographic isolation, poverty, and addictions; all of which relate to colonialism (Kral, 2016; Kral et al., 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Richmond, 2009; Tousignant, 2013). Within Labrador, the rate of suicide in some Indigenous communities is high, and a high percentage of cases have been associated with lower levels of mental health (Alaghehbandan et al., 2005; Edwards et al., 2008; MacNeil, 2008). In order to address mental health concerns, sports and physical activity have been identified as a key strategy. Indigenous Peoples have been participating in such activities long before white settlers arrived in North America (Dubnewick et al., 2018; Hall, 2006). Engagement in sports, especially highly accessible sports such as Olympic wrestling, may have a positive impact on the mental health of youth. Currently, however, many Indigenous communities have limited to no access to organized Olympic wrestling, despite its potential appeal to youth living in these areas. This may be due to lack of qualified instructors (Kamble & Wangwad, 2015; Kicker-Tucker, 1999; Meier, 2015;

Macro et al., 2009; Pettersson et al., 2013; Silvey et al., 2016; Sisjord & Kristiansen, 2009; Stevens et al., 2006). Developing an Indigenous-led Olympic wrestling program could allow for more youth to participate in physical activities and lead them to improving their physical and mental health through exercise. The next section will articulate the methodologies and methods, and justification of these methods that were used in this study around developing and evaluating an Olympic wrestling program in an Indigenous community in Newfoundland.

Environmental Scan

To assess the perceived need and sustainability of the program an environmental scan must be completed. Conducting a scan may be the first building block that enables researchers to create a relationship with the community in question. It could enable them to determine if the program is wanted by the majority of the community (perhaps those members who have not spoken directly to the researchers/program implementers), what facilities are available (if any), and how the program could be organized and implemented (Wilson, 2008; Patton, 2013). The use of a utilization-focused evaluation (UFE) was thought to be the best choice to accomplish an environmental scan of this type (Patton, 1997). The purpose of a UFE is to inform policy and program creators using the research findings. As stated by Patton:

> Utilization-Focused Evaluation begins with the premise that evaluations should be judged by their utility and actual use; therefore, evaluators should facilitate the evaluation process and design any evaluation with careful

> consideration of how everything that is done, from beginning to end, will affect use. Nor is use an abstraction. Use concerns how real people in the real world apply evaluation findings and experience the evaluation process. Therefore, the *focus* in utilization-focused evaluation is on intended use by intended users (Patton, 2013).

The use of a UFE allows for both stakeholders and organizations that will be key participants in the program to give input and evaluate the program before, during, and after it is completed. It has been shown that by increasing the involvement of stakeholders early on they become more committed to the long-term program (Williams, 2009).

UFEs have been used for a wide range of topics in health care over the past 25 years. There have been UFEs completed in AIDS' research programs, nursing orientation, knowledge translation, and gender sensitivity programs (Bowen & Martens, 2005; Dubois-Arber, Jeannin, & Spencer, 1999; Meyer & Meyer, 2000; Williams, 2009). Themessl-Huber and Grutsch (2003) have shown that the aspects of UFEs help empower the community/group in which the program is aimed and also can help bridge the gap between the implementers of the program, the evaluators, and the participants (Balthasar, 2006; Folkman & Rai, 1997). Involving stakeholders from the onset of a program's development and implementation is exactly what is required when creating a program with Indigenous communities and resonates well with Indigenous Methodologies. Using a UFE to evaluate any program will increase communication between researchers and the communities in question

and will empower these communities to decide what the program will look like once implemented (Balthasar, 2006; Themessl-Huber & Grutsch, 2003; Wilson, 2008). As the community has brought the idea to the attention of the researcher the UFE helps researchers fully understand how the community wants the program created in a way that will address their needs, not the needs of the researcher.

One issue that can limit how much input the stakeholders are able to give is how the UFE is created. In order to create an evaluation that will generate information useful to both the implementers and the stakeholders, questions must be designed in such a way that will help both groups understand the process. Following a model that has been created to guide researchers in the creation of initial questions can aid in this area and work to limit question bias (Hakan & Seval, 2011). For example, the initial survey could be designed according to the Context, Input, Process, and Product (CIPP) program development and evaluation model (Hakan & Seval, 2011). This model consists of a series of questions designed to highlight the environment in which the program will be placed (i.e., Context). It outlines the necessary resources, such as equipment, facilities, and manpower (i.e., Inputs); describes the necessary processes, for example, levels of coach certification and medical exams (i.e., Process); and, seeks to predict outcomes that will be used in the future to evaluate the effectiveness of the program for iterative improvements (i.e., Product) (Hakan & Seval, 2011). By first creating an initial set of questions based upon a model like CIPP some bias can be removed from the survey and empower stakeholders to a greater degree.

The Delphi method is an additional way to remove more bias from the UFE to insure the information gained is that of the Indigenous community and not that of the researcher. The Delphi method is used to gather information from a panel of experts in their particular field (Hsu & Sandford, 2007). By having the selected panel review specific areas of a questionnaire several times, researchers are able to converge on the correct wording and on selected questions for the survey. The approach is based on the notion that, two heads, or more, are better than one. Several experts anonymously examine the same questions to determine their relative importance, and the specifics of how the questions should be asked (Dalkey, 1972; Delbecq, van de Ven, & Gustafson, 1975; Hsu & Sandford, 2007). This technique has been used in several areas of research including health care, school administration and policy decision-making (Pike et al., 2015; Sinead, et al., 2011; Weerakoon & Knight, 2008). The Delphi method consists of several rounds in which the previous panelist responses are then incorporated through changing questions or by removing or adding other questions. Panelists then review the more concise survey, and once again give feedback on the questions. This not only allows the panel to review other responses but also allows them to reassess their own. Once again, the responses are incorporated. This process continues until a consensus is reached about each of the questions in the UFE. One of the best advantages of the Delphi method is its anonymity. This creates an environment for everyone's voice to be heard and can help dampen the influence that outspoken people can often have on review processes (Dalkey, 1972; Delbecq el al., 1975; Hsu & Sandford, 2007). The feedback given via the Delphi method helps reduce noise and bias from within the

UFE (Dalkey, 1969; Delbecq et al., 1975; Hsu & Sandford, 2007). Noise is defined as "communication which occurs in a group process which both distorts the data and deals with group and/or individual interests rather than focusing on problem solving" (Delbecq et al., 1975; Hsu & Sandford, 2007). Noise can create bias and skew the results of the survey. The anonymous characteristic of the Delphi method and through the use of multiple reviews, the panelists are expected to offer their opinions in a positive manner which will hopefully become more problem solving oriented, and minimize noise in the process (Delbecq et al., 1975; Hsu & Sandford, 2007). Although there is no consensus on an appropriate panel size for a Delphi method, a sample of 10-15 is considered adequate for most purposes and most authors recommend using the minimal number of participants required to balance representativeness and the likelihood of participants completing all survey rounds (Delbecq et al., 1975; Hsu & Sandford, 2007). Using the information from the environmental scan, an action plan on how to implement the program can be completed.

Train the Trainer

Train the trainer (TTT) courses, when applied to domains such as education, health care, and business, effectively initiate change while simultaneously building both capacity and sustainability (Orfaly et al., 2005). Their purpose is to provide a small group of individuals with the fundamental skills to train or teach others in their community or circumstance. These "graduates" are then expected to apply the general principles learned in the TTT course to develop their own contextually relevant activities, create a mentorship program, train other trainers, and encourage

community members to participate in these activities. By training residents of an Indigenous community on the skills of coaching an Olympic wrestling program the program can continue to thrive once research has been completed. This also empowers the community to take full control and ownership of the program after initial implementation and supports Indigenous methodologies (Kovach, 2009; Wilson, 2008). Potential candidates for a TTT course related to Olympic wrestling would be any physical education instructors, other school staff members, or parents of participating youth that live in the community.

Literature regarding implementation suggests that to achieve *sustainable* change, concurrently building a community of practice (CoP) alongside a TTT course is essential, where a CoP refers to a group of people who share a common interest (Grealish, Bail, & Ranse. 2010; Linkewich & Fortin, 2013; Urquhart et al., 2013). By sharing information and experiences within the group, individuals learn from each other and develop an identity as members of the group; therefore, helping to maintain an Olympic wrestling program as part of the project with the support of a virtual CoP. The community would be built using social media and networking (e.g., Facebook and YouTube) as age-appropriate tools that would link the youth with each other, their trainers, and members outside their community.

Considerations for the Wrestling Program

A high intensity youth training program such as an Olympic wrestling program needs to be carefully created by the Indigenous community and the researchers as well as introduced slowly because of the differences in physical maturation, training experience, and stress tolerance of the participants (Behm,

Avery, Faigenbaum, & Panagiota, 2008). Many youths are ready to participate in sports programs around the age of seven or eight. However, most Olympic wrestling programs do not accept youth under the age of ten years due to a fear of overtraining, injury, or burnout (American Academy of Pediatrics, 2000; Behm et al., 2008; International Federation of Sports Medicine, 1998**;** Kordi, Ziaee, Rostami, & Wallace, 2011). When designing a youth Olympic wrestling program for youth of that age or older it is important that the program be fun and enjoyable. Dishman et al. (2005) discusses the importance of creating an enjoyable exercise experience for young participants and states that this should be a priority as it can keep youth interested and participating in the program for a longer time. Olympic wrestling shares many similarities with resistance training (RT) in that it is of high intensity and requires the use of the whole body to move a weight (an opponent). Using similar training recommendations of RT for an Olympic wrestling program should help prevent injury or overtraining (Behm et al, 2008; Coutts, Murphy, & Dascombe, 2004).

Over the past several years RT has become more popular with youth. Several studies have shown that RT does not cause harm, but instead increases youth physical health when prescribed in a manner that is safe (American Academy of Pediatrics, 2001; Falk & Eliakim, 2003; Hass, Feigenbaum, & Franklin, 2001; Kenney, Humphrey, Bryant, & Mahler, 2006; Malina, 2006; McNeely & Armstrong, 2002; Smith, Stratton et al., 2004). The following regulations (Behm et al., 2008; National Coaching Certification Program, 2016) have been suggested for RT and general

sports programs and could be used to implement a safe and positive Olympic wrestling program:

- Qualified professionals should be available to supervise and give instruction (see previous section about Train the Trainer);
- Before allowing youth to participate, their cognitive development, physical maturity, and training experiences should be evaluated;
- Instructors need to maintain a safe environment free of hazards;
- A five to ten minute dynamic warm up should start each practice;
- Practice should be two to three times per week, non-consecutively for two hours;
- Progression should occur to make practices more intense as the youth improve;
- Focus should be primarily on technique and games to improve fitness, not on competition;
- Each practice should end with a cool down of less-intense activities and flexibility training;
- The program should change up regularly to avoid boredom.

Prior to any physical activity participants should warm up. For years, athletes at all training levels (recreation, competitive, and elite) have done a low-intensity aerobic workout followed by bouts of static stretching (Martens, 2004; Shehab, Mirabelli, Gorenflo, & Fetters, 2006). However, the ideas of static stretching prior to exercise are being questioned (Rubini, Costa, & Gomes, 2007; Shrier, 2004; Thacker,

Gilchrist, Stroup, & Kimsey, 2004). Several studies have shown that static stretching one muscle or muscle group longer than one minute can lead to decreases in force output and actually lead to injury rather than prevent it (McNeal & Sands, 2003; Zakas, Doganis, Galazoulas, & Vamvakoudis, 2006). However, shorter durations of static stretching (less than 30 seconds) can benefit participants and prevent musculotendinous injuries (Behm, Blazevich, Kay, & McHugh, 2016; Behm & Chaouachi, 2011). Dynamic stretching (lunges, skips, twists, and throws) are commonly used and recommended in order to raise core body temperature, increase range of motion, and increase blood flow to muscles (Faigenbaum et al., 2007). Dynamic stretching also forces youth to focus at the beginning of the practice, whereas during bouts of static stretching youth can become bored and their mind may begin to wander (Graham, 2001). The cool down at the end of the practice is the time to complete static stretching (Behm et al., 2008). This gives youth a chance to relax and reflect on the practice and can prevent delayed onset muscle soreness after training has been completed (National Association of Sport and Physical Education, 2005).

There are of course risks and concerns for any youth or adult training program. As mentioned in section two, Olympic wrestling has been shown to have the least amount of injuries of all high school sports currently offered. That having been said, caution is still required (Caswell et al., 2017; Hootman et al., 2007; Nelson et al., 2007; Rechel et al., 2008). The most common injuries in Olympic wrestling are face lacerations and contusions. Over 90% of these injuries occur at the highest level of competition (Olympics, university athletics) with high school wrestling having very

few injuries (Shadgan, Molnar, Sikmic, & Chahi, 2017; Caswell et al., 2017; Hootman et al., 2007; Nelson et al., 2007; Rechel et al., 2008). The most likely injuries to occur from an Olympic wrestling program offered to youth are soft tissue injuries due to overtraining. As discussed previously, these injuries can be avoided by making sure youth do not over train. To limit any risks, the coaches/volunteers should be properly trained in working with youth in sports either by participating in training courses such as National Coaching Certification Program or by having an education in youth physical fitness, i.e. physical education instructor (Behm et al., 2008; Coutts et al., 2004). As this program would target youth who do not normally participate in sports, it is essential that coaches/volunteers be aware of the inherent risks that can accompany new comers who engage in intense physical activity and are prone to overestimate their abilities (Plumert & Schwebel, 1997). The program should progress from basic technique involving games that teach technique and keep the youth active, to a higher intensity level of sparring (wrestling) with each other (National Coaching Certification Program, 2016). This will give the youth's' bodies time to adapt to the intensity of the program and prevent injuries.

Summary

To create a successful program an initial environmental scan needs to be completed to ensure that the stakeholders have interest in the program, want the program, and that the community has the facilities to allow for the program to become successful. This can also give stakeholders the opportunity to voice their opinions about how the program should be run. Once this is completed individuals within the target community should be trained on how to maintain the program

after implementation with little supervision. Lastly, due to Olympic wrestling's high intensity physical workload, a program should follow the guidelines of a resistance-training program. This will help to prevent injuries and also create a positive environment for youth to participate in something new and exciting.

Part 4: Evaluation

Once any type of program is implemented it must be evaluated in order to determine if it is completing its objectives (Chilcot et al., 2011; Green & Thorogood, 2014; Walsh, Mitchell, Francis, & van Driel, 2015). This Olympic wrestling program will be evaluated to determine if there is an improvement in the physical and mental health of the youth who choose to participate. The following section will discuss the physical and mental health tests that could be best suited for this evaluation.

Mental Health

The success of an evaluation is dependent on the reliability and validity of the tool used (Brook & Kutcher, 2001; Rabkin & Klein, 1987; Walsh et al., 2015). There are currently several different evaluation tools that can be used to examine the mental health of youth and adults. They fit into two categories: diagnostic identification and symptom evaluation (Brook & Kutcher, 2001). Diagnostic identification tools are always completed using an interview of some kind in which either the questions are structured and are the same for each interview or in which the interviewer can shift the focus of the questions as needed (Brook & Kutcher, 2001; Walsh et al., 2015). This category of evaluation tool can help researchers find out more about an individual's mental health status, but can also lead to items being missed by the interviewers. These types of evaluations are also extremely time

consuming and participants may not return for subsequent interviews (Brook & Kutcher, 2001; Walsh et al., 2015).

Symptom evaluations are broken down further into two types: observer-rated and self-rated scales. Observer-rated scales have a great reliability, validity, and sensitivity to the changes that occur with treatment (Brook & Kutcher, 2001; Rabkin & Klein, 1987). They are also time consuming, costly, and require a level of expertise (Brook & Kutcher, 2001; Rabkin & Klein, 1987). Self-rated scales may not be as accurate and are not able to diagnose psychiatric disorders. On the other hand they can be completed rapidly and cost very little (Brook & Kutcher, 2001; Rabkin & Klein, 1987;). Self-rated scales work well in schools (high number of participants) and also are valid and reliable when determining if some participants require a secondary, more in-depth assessment. These scales also work well to compare two separate cohorts, i.e. participants and non-participants (Brook & Kutcher, 2001). The project for this thesis is to be conducted with youth in a school setting conducted with youth that participate in the Olympic wrestling program vs. those that do not. The remainder of this section will focus primarily on self-rated scales.

The Beck Depression Inventory (BDI)

The BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is considered to be the best choice for adult self-reporting of depression. Beck et al. (1961) selected 21 items, which he considers to be a whole representation of the attitudes and symptoms of individuals suffering from depression. Like many self-rated scales, the participants select one of four or five statements about how they have been feeling

over the past week. The choices are then scored and the final score fits into a range that will suggest the level of a participant's depression.

Although the BDI is well known and used regularly when measuring depression in adults, it has not been shown to be as reliable for children or adolescents (Brooks & Kutcher, 2001; Chilcot et al., 2011; Green et al., 2015; Lerdal, Kottorp, Gay, Grov, & Lee, 2014; Preljevic, et al., 2012; Wikberg et al, 2015). This may be due to the test's high reading level (Atlas & Discipio, 1992; Moilanen, 1995). It has been shown to have a degree of reliability and sensitivity to change however, there have been arguments about what exactly the BDI is measuring (Green et al., 2015). Due to the wording of some of the questions the test may actually be measuring the participants' dysphoria, dissatisfaction, demoralization, or anxiety (Brooks & Kutcher, 2001).

The Children's Depression Inventory (CDI)

Unlike the BDI, Kovacs' (1992) current CDI is a self-rated depression scale specifically designed for children. Originally created in 1977, the CDI is a lower reading level version of the BDI that examines levels of depression suffered by youth. The self-rated scales function similarly to the BDI in that participants select one statement from a list as an answer to a question (a total of 27 questions). It has been shown that the 27 questions were too long and youth would often lose focus, thus, other authors have developed shorter versions (Carlson & Cantwell, 1980; Kovacs, 1992; Wierzbicki, 1987). Although the CDI is aimed at youth, unlike the BDI, it still suffers from some issues. Several studies have shown that the CDI does not

discriminate enough between depressed and non-depressed youth (Funduis et al., 1991; Weissman, Orvashel, & Padian, 1980). It is however, highly sensitive to changes in an individual's level of depression (Fine, Forth, Gilbert, & Haley, 1991; Garvin, Leber, & Kalter, 1991; Stark, Reynolds, & Kaslow, 1987). Thus, to examine individual changes in youth, the CDI would be a good choice, however to measure the changes in groups of youth, or comparing one youth to a group, it may not be the optimal choice.

The Mood and Feelings Questionnaire (MFQ)

The MFQ was designed specifically to examine depression in youth ages 8 to 18 (Angold et al., 1995). This self-rated test ranges from 30 to 35 questions with participants responding to given statements by selecting "true," "sometimes," or "not true." Each question relates to an area that has been considered to have a strong influence on depression in youth such as feelings of loneliness, being unloved, being ugly, etc. (Brooks & Kutcher, 2001). Due to the length of the test Angold et al. (1995) also created a shorter version, which has only 13 questions.

Although the MQF has been determined to be valid in determining levels of depression it does not assess suicidal ideation (Brooks & Kutcher, 2001). Thus, in order to determine if individuals who are suffering from depression also have suicidal thoughts, another test would have to be completed after the MQF. This would add to the amount of time and funds needed to determine the level of depression along with suicidal ideation, and would disqualify this test from the examination of suicidal ideation in youth. Lastly, the MQF has been shown to

positively identify depression in youth, but authors have demonstrated that the MQF is not sensitive to change over time (Vostanis, Feehan, Grattan, & Bickerton, 1996; Wood, Harrington, & Moore, 1996).

The Reynolds Adolescent Depression Scale (RADS)

The RADS (Reynolds, 1987) measures the severity of depression in youth ages 13 to 18. It consists of 30 questions that focus on the frequency of occurrence of a particular state that can lead to depression or is caused by depression via four responses: "almost never," "hardly ever," "sometimes," or "most of the time." Unlike other self-rated tests mentioned previously the RADS also has questions about the frequency of happiness incorporated to check the response sets. Reynolds and Coats (1987) have shown that the RADS can detect the changes in the degree to which youth are suffering from depression. They also showed that the RADS is less sensitive to this change than the BDI.

The RADS also has been shown to be reliable and valid in the use of group assessments in the school setting (Baron & DeChamplian, 1990; Reynolds, 1994; Reynolds, 1987; Shain, King, Naylor, & Alessi, 1990). This makes RADS a strong candidate to be used by researchers working in schools. One issue with the RADS is its scoring system has been shown to be flawed and as much as one third of all classified depressed youth are false positives (Brook & Kutcher, 2001). Also, the RADS has been shown to not be a good indicator of changes of depressive symptoms over time (Barona & DeChamplain, 1990; Brooks & Kutcher, 2001). These two last

points would make it difficult to use the RADS for a long-term intervention study examining the changes of youth depression.

The Kutcher Adolescent Depression Scale (KADS)

The KADS (Kutcher, 2002) is designed to measure the changes in the levels of depression among youth ages 12-17 years. The initial KADS was 16 questions, however after three studies were completed on the validity, reliability, and sensitivity of this scale, the KADS number of questions was dropped to 11 and focused more on suicidal tendencies rather than on depression (Brooks, Krulewicz, & Kutcher, 2003; Brooks 2004; LeBlanc, Almudevar, Brooks, & Kutcher, 2002). This scale is similar to the RADS, in that for each question, a statement is given and participants have a choice to answer with "hardly ever," "much of the time," most of the time," or "all of the time." Each statement relates to the mental health of youth as it pertains to suicide and depression, for example, "Over the last week have you felt low mood, sadness, feeling blah or down, depressed, just can't be bothered," (Brooks, 2004). Each response is given a score of 0-4 and at the end the score is added to give the youth a baseline score. There are no validated diagnostic categories for the scores instead; participants are scored against themselves to see if any improvements have occurred due to any interventions (Brooks, 2004).

The KADS has been shown to be a useful scale in the school setting, as it is time efficient, sensitive to change over time for each individual participant, and valid (Brooks et al., 2003; Ewa et al., 2015; LeBlanc et al., 2002). One of the weaknesses of the KADS is it cannot determine the severity of an individual's depression but only

the change that occurs over time of said depression (Brooks, 2004). This must be considered when working with the KADS.

Each of the five self-rated scales have their own strengths and weaknesses. In reflection it would seem that the KADS would be best situated for measuring the effects a program has on improving the mental health of youth. As the KADS is inexpensive, time efficient, designed specifically for youth, has a lower reading level then some of the other scales, is highly sensitive to change, and measures suicidal ideation, it would be the right candidate to be used in the program (Barona & DeChamplain, 1990; Brooks & Kutcher, 2001; Brooks et al., 2003; Ewa et al., 2015; Funduis et al., 1991; Green et al., 2015; LeBlanc et al., 2002; Morer, Blanch, Gasol, Cirera, & Valdes, 1998; Vostanis et al., 1996; Weissman et al., 1980; Wood et al., 1996).

Physical Health

To determine if the Olympic wrestling program is having a positive impact on the physical health of the participants, physical testing can be conducted. The best option would be to have each participant come to a laboratory in which several tests could be completed in a controlled environment (Armstrong, 2015). Due to the remoteness of the target community, the cost of transportation, and time constraints, this is not possible. Instead the testing must be completed in the community, most likely, at the school during school hours. Based on this information, several tests that are not time consuming, are inexpensive, can be completed in the field, and can be done with a large number of participants will need

to be used. Several such tests to examine different physical health traits will now be discussed.

Cardiovascular Fitness

The gold standard for determining a participant's cardiovascular fitness is the VO2 max test. (Farrell, Wilmore, Coyle, Billing, & Costill, 1993; Taylor, Buskirk, & Henschel, 1981). A participant's peak VO2 score relates to their level of cardiovascular fitness (higher score is equal to higher level of oxygen uptake) (Farrell et al., 1993; Taylor et al., 1981). However, a VO2 test cannot be completed quickly, or cost efficiently in the field due to its requirement of a large apparatus and trained personnel (Mikawa & Hideaki, 2011; Leger & Lambert, 1982; Singh, Morgan, Hardman, Rowe, & Bardsley, 1994). Instead, the 20m shuttle run test (SRT) has been shown to be a good indicator of an individual's level of cardiovascular fitness and can be done easily in the school setting (Barnett, Chan, & Bruce, 1993; Boreham, 1990; Castro-Piñero, et al., 2010; Leger & Lambert 1982; McNaughton, Hall, & Cooley, 1988; McVeigh, Payne, & Scott, 1995; Matsuzaka et al., 2004; Pitetti, Fernhall, & Figoni, 2002; Ramsbottom, Brewer, & Williams, 1988; Ruiz, Ramirez-Lechuga, Ortega, Castro-Piñero, & Benitez, 2008). The SRT is easily accomplished, as participants run 20 meters more rapidly as time increases until they are unable to continue (speed of runner increases from 8km/hr to 18.5/km). A score is given to participants when they stop and this score is correlated to their peak VO2 and thus their cardiovascular fitness. The SRT can be completed in as little as ten minutes and only requires the use of a flat surface on which participants can run and a sound

system of some sort (Barnett et al., 1993 Boreham, Paliczka, & Nichols, 1990; Castro-Piñero et al., 2010; Leger & Lambert 1982; McNaughton et al., 1988; McVeigh et al., 1995; Matsuzaka et al., 2004; Pitetti et al., 2002; Ramsbottom et al., 1988; Ruiz et al., 2008).

Upper Body Muscular Strength

There are several tests that can be used to measure upper body strength. Some of these tests such as the number of chin-ups in one minute, however, should be avoided when working with youth. Chin-up tests require a minimum amount of strength and it has been shown that many youths are unable to accomplish even one repetition, especially if they are overweight (Mikawa & Hideaki, 2011; Milliken, Faigenbaum, Loud, & Westcott, 2008; Pate, Burgess, Woods, Ross, & Baumgartner 1993). This leads to many youths having a score of zero and even after long training programs they remain at zero if there are no changes in body composition.

The one repetition maximum (1RM) is the most commonly used test for upper body muscular strength (Faigenbaum et al., 2002; Faigenbaum, Milliken, Moulton, & Westcott, 2005; Fernandez, Ruiz, Gonzalez-Montesinos, & Castro-Piñero, 2015; Milliken et al., 2008; Ozmun, Mikesky, & Surburg, 1994; Ramsay, et al., 1990; Woods et al., 1992). To test upper body strength, participants bench press a specific amount of weight one time, and after each successful lift (with a rest of 3-5 minutes between) more weight is added until the participant is unable to life the weight. Although the test is very simple, an apparatus is required, along with individuals to supervise, and the test can be extremely time consuming (due to the long breaks

taken) (Milliken et al., 2008). Lastly, there is a large learning curve with any 1RM test. If the individual does not normally practice the chosen exercise they will have neurological adaptations occurring as they progress through several tests over a period of time and thus the pre to post results will be a measure of more than just muscular strength (Faigenbaum et al., 2002; Faigenbaum et al., 2005).

A test that is cost efficient, takes little time, can be done in the field, removes weight bias from the test results, and requires a very low minimal amount of strength is the handgrip test (Fernandez et al., 2016; Mikawa & Hideaki, 2011; Milliken et al., 2008). The handgrip test has been shown to give very similar results to the 1RM test (within 91%) and can be done in any environment, requires little equipment, and takes seconds to complete (Fernandez et al., 2016; Milliken et al., 2008). Participants simply squeeze a small dynamometer for three seconds and the device records the amount of force produced in kilograms. It is thus very simple, easy for participants to understand, has a very small learning curve, is highly sensitive to change and can be completed in a school setting with a large number of participants (Fernandez et al., 2016; Mikawa & Hideaki, 2011; Milliken et al., 2008).

Upper Body Muscular Endurance

A study by Woods et al. (1992), among others, shows that the timed bent arm hang (half chin-up and hold), number of pushups, and number of chin-ups tests all relied heavily on the amount a participant weighs (Castro-Piñero et al., 2011; Fernandez et al., 2016). This would normally remove these tests from selection. However, the number of pushups in one-minute test can be adapted to remove

weight bias as long as each individual is only being compared to their own data (pre and post tests) (Fernandez et al., 2016). Normally, a pushup is done on the toes, but if the individual does them on their knees, the lever of force is shortened and thus the required amount of strength to accomplish a pushup is lowered (Woods et al., 1992). By only comparing the changes of one individual to another, the weight bias is removed, and only the number of pushups or adapted pushups are compared (Fernandez et al., 2016). This test can be done in groups, only lasts one minute, and requires no equipment, making it a good choice for field research.

Flexibility

The sit and reach (SR) is the most common flexibility test used and has a high validity as a measure of hamstring and lower back flexibility (Castro-Piñero et al., 2010; Jackson & Bake, 1986; Jackson & Langford, 1989; Wells & Dillon, 1952). The test requires a small apparatus, in which participants place their feet on the inside of a box while sitting on their buttocks, and try to reach as far forward as possible without bending their knees. This test takes only a few moments to familiarize a group of individuals with the procedures and is completed in a few seconds (Wells & Dillon, 1952).

Body Composition

Several methods of determining skin fold thickness have been validated in recent years. The skin fold thickness examination measures how much skin can be pinched on the body in specific areas (triceps, subscapular, and calf). The amount of

skin that is measured is then analyzed through the Slaughter or Brook equation to determine the amount of fat found on the participant's body (Buison, Ittenbach, Stallings, & Zemel, 2006; Campanozzi, Dabbas, Ruiz, Ricour, & Goulet, 2008; Gutin, Litaker, Islam, & Manos, 1996; Rodriguez et al., 2005; Treuth, Butte, Wong, & Ellis, 2001). This procedure is very invasive and requires proper technique that can take time to learn. It can also lead to participants dropping out of a study due to embarrassment or being self-conscious of exposing those areas of their bodies required for testing.

The Body Mass Index (BMI) is much less invasive, faster, and simpler than the skin fold thickness examination (Daniels, Khoury, & Morrison, 1997; Ellis, Abrams, & Wong, 1999; Lindsay, Hanson, & Knowler, 2001). To calculate an individual's BMI, the weight of a participant (kilogram) is divided by their height squared (centimeters^2) (Daniels et al., 1997; Ellis et al., 1999; Lindsay et al., 2001). The score given is then associated with several health outcomes based on the number. The BMI and Slaughter equation have been shown to be highly correlated with participants ages 11- 17 years (Steinberger et al., 2005). Several studies have shown that when examining groups with lower levels of body fat, the skin fold thickness examination is more accurate, however, with groups that have higher levels of body fat the BMI is extremely accurate to determine the percent of body fat and health outcomes that may arise (Freedman, Ron, Ballard-Barbash, Doody, & Linet, 2004; Steinberger et al., 2005). Lastly, BMI has been shown to be sensitive to change but cannot differentiate between changes in body fat and in fat free mass (Daniels et al., 1997). The BMI does have one major flaw however; it does not

differentiate between body mass compositions of fat and muscle. Thus a person of high muscle content could be seen as obese when they are in fact of high fitness (Freedman et al., 2004).

Summary

When working in a controlled laboratory environment with highly trained individuals along with an unlimited budget and no time constraints there are several tests that can be completed to measure the changes in youth physical health. In order to measure the effects of an Olympic wrestling project on rural Indigenous youth, a laboratory setting is not an option. To meet the demands of examination, tests must be completed that are quick (fit into the time frame the school will allow), cost effective, do not require a high number of personnel, and are simple for youth to accomplish. There are several tests that fit this group: 20m shuttle run, handgrip test, number of pushups in one minute, sit and reach, and finally the BMI. Although each of these tests do have some weaknesses, they allow researchers to perform them with very little resources in difficult to reach regions.

Final Summary

The literature review has shown that there are a higher number of individuals suffering from depression that can lead to suicide and suicide ideation living in Indigenous communities in Canada. These higher numbers are also true for Indigenous communities in Newfoundland and Labrador. Physical activity has been shown to increase mental health and currently several different physical activities are offered in Indigenous communities. However, there are several barriers that prevent Indigenous youth from participating and gaining the benefits of physical

activity. The sport of Olympic wrestling is being highlighted to demonstrate that it can be highly accessible to youth and be a good addition to any physical activity program that is aimed at improving Indigenous youth mental and physical health. A program created by the Indigenous community in question, offered several times per week, and coached by a trained individual has the potential to be sustainable and successful. One of several mental health self-evaluations and/or several physical health tests could evaluate the program to determine if improvements are occurring with participating youth. A program of this nature has the potential to create change in Indigenous and non-Indigenous communities that are suffering from low levels of mental health. As shown here, an Olympic wrestling program offered in Indigenous communities in Newfoundland and Labrador has the potential to increase the mental and physical health of youth, lower the rates of suicide, and increase community cohesion.

The following six papers address:

1. The methods, frameworks, and methodologies used to develop, implement, and evaluate the Olympic wrestling program created in and with the Indigenous community;
2. Environmental scan and the interest of an Indigenous community in an Olympic wrestling program, and specifically, how they want it developed and implemented in their community;
3. Impacts of an Olympic wrestling program on Indigenous youth's physical and mental health;

4. An Indigenous youth's changes in physical and mental health after participating in the Olympic wrestling program, A Case Study;
5. How some of the Indigenous youth perceived the Olympic wrestling program and its impacts through the use of photovoice as an evaluation tool;
6. How competition in Olympic wrestling at a major provincial tournament impacted the Indigenous youth who competed.

Co-authorship Statement

I, Dustin Silvey was the main contributor to all of the following manuscripts. I designed each of the following studies with the guidance of my supervisors Dr. Adam Dubrowski and Dr. Catherine Donovan. I completed all practical aspects of the research, visiting Miawpukek First Nation, implementing the wrestling program, collecting data, analyzing data, sharing data with the community, and presenting the data at conferences. The manuscripts were each prepared by me, however my supervisors and my committee members, Dr. Erin Cameron and Dr. Carolyn Sturge Sparkes, also edited and reviewed them.

The manuscripts have been submitted and published with the following authors as such:

Manuscript 1 (Submitted): Dustin Silvey, Catherine Donovan, and Adam Dubrowski.

Manuscript 2 (Published): Dustin Silvey, Richard Buote, Erin Cameron, Catherine Donovan, and Adam Dubrowski.

Manuscript 3 (Submitted): Dustin Silvey, Richard Buote, Erin Cameron, Catherine Donovan, and Adam Dubrowski.

Manuscript 4 (Published): Dustin Silvey, Richard Buote, Catherine Donovan, and Adam Dubrowski.

Manuscript 5 (Submitted): Dustin Silvey, Catherine Donovan, and Adam Dubrowski.

Manuscript 6 (Published): Dustin Silvey, Richard Buote, Catherine Donovan, and Adam Dubrowski.

Chapter 3: Manuscript 1

Application of Frameworks for an Olympic Wrestling Program in an Indigenous Community

Abstract

The journey of reconciliation between non-Indigenous and Indigenous Peoples of Canada has come to the forefront of many political discussions, media outlets, and research over the past several years. While ethical standards dictate engagement of Indigenous People in research, research institutes and funding agencies have mandated this be the case when conducting research with Indigenous communities on their lands and with their people. Many researchers however, lack the knowledge of methodological frameworks to approach Indigenous communities in order to build long lasting and mutually beneficial relationships. Further, once these relationships are created, researchers may be unsure what frameworks and tools might best serve the communities goals along with their own research goals. Working within both a Community Based Participatory Research framework and the Indigenous School Health framework gives guidance for building strong long lasting relationships between researchers and Indigenous communities while working within a school setting. The purpose of this paper is to discuss the methodology and methods used by researchers who, with the help of an Indigenous community implemented and evaluated an Olympic wrestling program in their community. Sports programs in Indigenous communities are an under researched area and the work which this paper discusses was completed to shed light on the benefits of physical activity and sport on the holistic health of Indigenous youth. The

frameworks and tools presented in this paper may not be suited for all research types however; the lessons learned by the researchers may help to strengthen the relationship between non-Indigenous researchers and Indigenous communities.

Background

Canadian Indigenous populations living on and off reserve experience lower levels of mental and physical health than non-Indigenous Canadians (Kral, 2016; Tousignant, Vitenti, & Morin, 2013). Studies have shown that Indigenous Canadians suffer from higher rates of suicide, attempted suicide, and obesity (Lehti, Niemelä, Hoven, Mandell, & Sourander, 2009; MacNeil, 2008). These lower levels of mental and physical health have been shown to be associated with emotional trauma, lack of a parental figure, family disruption, lack of access to social support, and loss of identity (Kral, 2016; Tousignant, et al., 2013). Physical activity has been shown to increase the physical and mental health of youth through empowerment and community building (Kort-Butler & Hagewen, 2011; Warner & Dixon, 2013).

One of the main ways youth participate in physical activity is through sport. Sport has become more commonly used as a health intervention to promote physical activity (WHO, 2003). While there is some evidence to the contrary there is good evidence that sport can increase social connectedness, reduce engagement in risky behaviors, break down racial/ethnic barriers, and improve youth physical and mental health (Babiss & Gangwich, 2009; Burnett, 2009; Right to Play International, 2008). Since World War I, sport has been used to help emerging nations create community and has recently been used in places such as South Sudan (Burnett, 2009; Kidd, 2008; Richards et al., 2014; Shilbury, & Green, 2008). These sport

programs were created to increase development in newly made nations (Sport for Development) and have been shown to increase physical fitness, mental health, community identity, social cohesion, upward social movability and integration (Burnett, 2009, Njelesani, Fehlings, Tsang, & Polatajko, 2016; Richards et al., 2014). Schulenkorf (2012) has shown that sports have an "intrinsic" or natural power to encourage communication and change attitudes and behaviors towards community. Sports have been a part of Indigenous culture before the time of colonization. The Inuit games were first created to improve hunting skills, and Indigenous Peoples created Canada's national sport, the game of lacrosse (Fisher, 2002; Issaluk & Maruyama, 2012).

Nicholson, Brown, and Hoye (2013) have shown that sports can lead to a sense of connectedness and offer greater social support than that documented in other community organizations. A sense of connectedness can lead to an increase in mental health (increase self-efficacy), an increase in emotional health (more positivity), and an increase in spiritual health (becoming a more social and centered individual). This demonstrates that sport programs have the ability to address health through a *holistic perspective*. However, all sports can also have detrimental impacts on participants: stress levels of youth can be increased by competitions; poor role modeling by coaches can cause mirroring of inappropriate behaviors; and the use of performance enhancing drugs can lead to severe health problems (McHugh, Holt, & Andersen, 2015). When working with Indigenous communities, sport program implementation must be done carefully and with proper guidance from Indigenous Peoples to not only avoid the detrimental impacts but also to be

sensitive to the fact that sport once was used as a tool of colonialism: when residential schools were open in Canada (1800s -1996) the Canadian government used mainstream non-Indigenous sports to attempt to assimilate Indigenous Peoples and control youth within residential schools (Forsyth & Giles, 2012; Forsyth, 2007; Kovach, 2009; Wilson, 2008). Thus, sport programs when implemented into a community specifically, an Indigenous community, must follow community guidance, needs, and a framework that is Indigenous appropriate to ensure that the sport program does no harm to the people of the community (Kovach, 2009; Wilson, 2008).

Few studies have examined sport participation among Indigenous youth (McHugh et al., 2015). More studies could shed light on the sporting needs and wants of Indigenous youth and Indigenous communities and could lead to increased sport participation in Indigenous communities (McHugh et al., 2015). However, research on such programs and youth must be conducted in a manner that is suited for Indigenous communities. The damages of colonization (the act of colonialism) and colonialism (the idea/theory of believing one group is greater than another and can therefore take from the "lesser" group) have been exacerbated by research ethics that allowed research studies to be conducted on Indigenous Peoples rather than with and for Indigenous Peoples (Wilson, 2008). Due to the damage research has caused on Indigenous Peoples around the world Indigenous research methodologies have been put forward (Bishop, 2005; Kovach, 2009; Smith, 1999; Wilson, 2008). Indigenous methodologies reflect that knowledge cannot be owned as it is: an accumulation of information from different perspectives; dynamic as it

grows over time; holistic in incorporating all aspects of life such as spirituality, history, cultural practices, social interactions, language, and healing; unique to each Indigenous culture; and is relational (Bishop, 2005; Kovach, 2009; Wilson, 2008). Thus a relationship between the research and the community in question must be formed. Two framework models one for research and one for programming that have the potential to mitigate the impacts of colonization and colonialism are the Community Based Participatory Research framework and the Indigenous School Health Framework. These two frameworks highlight the importance of Indigenous community involvement in any intervention that is created to improve the health of community members. As stated by Wilson (2008), Indigenous involvement is vital to any research project that takes place within in their community. These will be discussed further in the following sections.

Community Based Participatory Research (CBPR)

Wilson (2008) discusses the importance of relationality when working with and within Indigenous communities. He points out that a solid relationship must be formed between researchers and the community in question before research can occur. This relationship is the foundation upon which the research project can be built. The CBPR framework is a relationship building approach to research that creates an atmosphere of equity and sharing among researchers, participants, communities, and other stakeholders (Israel, Schulz, Parker, & Becker, 1998). These relationships allow for the sharing of expertise, needs, wants, decision-making and work to benefit the community (Israel et al., 1998). There are many positive reasons to use a CBPR framework when working with Indigenous communities and

peoples: it allows the communities to have more control of the projects; the communities have more access to the data; it creates a team of experts between the researchers and communities; it incorporates local knowledge; creates trust among researchers and communities; aids in bridging cultural gaps; and it can work to empower the community (Israel et al., 1998; Liu et al., 2011).

Complications and miscommunication can occur easily during the early stages of the relationship building process (Israel et al., 1998). To avoid these complications, Israel et al., (1998) has laid out several guidelines to follow when doing CBPR with a community. The CBPR framework stipulates that it is important to discuss and identify the key goals of all parties involved near the beginning of the program. This will allow each stakeholder to understand his or her own role, responsibilities, and goals. Each relationship should foster a democratic leadership style in which all voices can be heard before decisions are made. Wilson (2008) and Kovach (2009) also instill the importance of this idea when working with Indigenous communities. Israel et al., (1998), Kovach, (2009), and Wilson, (2008) all stress the importance of taking a period of time to build a strong relationship between the community and researchers; and also discuss the importance of the researchers' view of this relationship: the relationship should not be viewed as another project, but as a long-term investment with the community.

Indigenous School Health Framework

In 2010, the National Collaborating Centre for Aboriginal Health (NCCAH) released "A Framework for Indigenous School Health: Foundations in Cultural Principles." This document articulates ideals and guidelines that should be followed

to create a successful health or education intervention in a school within a community. The NCCAH (2010) framework discusses the importance of researchers and policy makers approaching Indigenous health with a *holistic perspective*. This *holistic health perspective* as practiced by many Indigenous Peoples around the world, acknowledges that health is based upon a balance in physical, mental, spiritual, and emotional health, with a key component being community cohesion (Assembly of First Nations, 2013; NCCAH, 2010). In adapting this perspective, researchers will be inclined to focus on the individual and the causes of health issues rather than the health issue itself (NCCAH, 2010; Wilson, 2008). A major difference between the contemporary Western view of health and that of Indigenous Peoples is that the Western view recognizes health as a possession that can be owned (NCCAH, 2010). Whereas, the Indigenous view of health is that it is a set of relationships that include the individual, the families, their communities, and their environment: *a holistic perspective* (Auger, Psych, & Gomes, 2016; Howell et al., 2016; Snyder & Wilson, 2015).

Application of the Frameworks

Over the past three years, Silvey et al., (2018) worked with and within an Indigenous community in the province of Newfoundland and Labrador (NL), Canada to develop, implement, and measure the impacts of a youth Olympic wrestling school based program. The goal of the program was to help increase youth physical and mental health while creating a community of practice (Silvey et al., 2018). In order to create a sustainable program in which the community had control, researchers followed a Community Based Participatory Research (CBPR) framework

heavily influenced by the Indigenous School Health Framework (ISHF). The research project conducted by Silvey et al. (2018) used a multiple methods approach to create a trusting relationship with the Indigenous community, school, and youth; and also to measure the impacts the program had on youth holistic health rather than just youth physical health. The aim of this manuscript is to describe the framework and methods followed by Silvey et al. (2018) such as a utilization focused evaluation, Train the Trainer (TTT), community of practice, one on one interviews/surveys, and photovoice. This manuscript will also discuss how these methods were used to promote relationship building between researchers and Indigenous communities, and how the methods allowed for data collection through Indigenous methodologies, following the CBPR and Indigenous School Health Frameworks. All of the methods discussed here may not be applicable to each community and researcher; however, the lessons learned by Silvey et al. (2018) may aid other researchers in building strong relationships with other Indigenous communities.

Relationship Building

Following, Bishop's (2005), Wilson's (2008), and Kovach's (2009) concepts of relationship building and working within the CBPR framework it was the first priority of Silvey et al. (2016) to build a strong relationship with the community in question prior to any development and evaluation of the proposed Olympic wrestling program. Researchers initially reached out to Indigenous leaders of the community in February 2015 to discuss the idea of bringing an Olympic wrestling program into the community. That March, three researchers/coaches of Silvey's

team went to the community and sample practices were conducted with youth during their normal physical education classes. Information regarding the Olympic wrestling program and what some of the benefits of having the program could be were presented to the community during a community hosted potluck and then later presented to the Chief and Band Council. This gave the Chief, Band Council, parents, and youth from the community a chance to voice any initial concerns or comments they might have about the program, but also worked to create a positive relationship between the research team and the community. One month later, the community contacted the research team to ask them to begin a program in January 2016. This initial relationship created a foundation of trust between the research team and the community and would allow for further collaboration throughout the program (Israel et al., 1998; Kovach, 2009; Wilson, 2008).

Utilization Focused Evaluation

During November 2015, in order to assess the perceived need and the sustainability of the program, the community and researchers decided to run an environmental scan using utilization focused evaluation (UFE) (Silvey, Buote, Cameron, Donovan, & Dubrowski, 2016). The purpose of a UFE is to inform policy and program using research findings (Bryson, Patton, & Bowman, 2011; Patton 2013; Patton, 1978). In other words, the use of UFE allows for stakeholders and organizations that will be the key participants in a program to give input on the evaluation of the program before it begins. It has been shown that by increasing early stage involvement of stakeholders they become more committed for the long-

term (Williams, 2010). Themessl-Huber and Grutsch (2003) have also shown that the aspects of UFE can help empower the community/group to which the program is aimed and also can help bridge the gap between the implementers of the program, the evaluators, and participants (Folkman & Rai, 1997). To create a UFE that allowed for optimal information exchange, Silvey et al. (2016) designed the UFE with a combination of the Context, Input, Process, and Product (CIPP) model and the Delphi method by later having the questions evaluated using a panel of experts in teaching, Indigenous research, sport, and community (Hakan & Seval, 2011; Hsu & Sandford, 2010).

Involving community members from the onset of the program development and implementation was the goal of Silvey et al. The use of UFE gave community members the opportunity to speak up anonymously through a survey about any concerns they might have about the program, along with giving feedback about how they wanted the program to be operated. Some examples of information garnered from the UFE included where the program should be conducted, who should coach it, how often the program should be run, and what age of youth should be eligible to participate (Silvey et al., 2016). This process allowed valued community input in a way that was unintimidating creating a level of comfort and confidence and identifying roles for both community members and researchers and leading to a strong foundation for CBPR (Isreal et al., 1998).

The use of the UFE is not in itself an original idea, however, within a CBPR, the UFE combined with the initial meeting gave community members the opportunity to define the Olympic wrestling program for their community (Kovach,

2009; Wilson, 2008). These efforts lead to a stronger sense of ownership of the program which would promote sustainability, while having the research team there to aid them in the development, implementation, and evaluation of the program.

Train the Trainer

In attempting to work within Indigenous methodologies as laid out by Kovach (2009), Wilson (2008), and Smith (1999) sustainability of the program after its initial implementation was a key component of Silvey et al.'s (2018) program. This also was consistent with the CBPR framework that guided the program. To ensure sustainability it was important that the community be given the tools to maintain the Olympic wrestling program with little outside aid. The team used a Train the Trainer model (TTT) to instruct the community in the skills required to coach Olympic wrestling. TTT courses, when applied to domains such as education, health care, and business, effectively initiate change while simultaneously building both capacity and sustainability (Orfaly et al., 2005). The purpose of TTT is to provide a small group of individuals with the fundamental skills to train others in their community. These "graduates" are then expected to apply the general principles learned in the TTT course to develop their own contextually relevant activities, create a mentorship program, train other trainers, and encourage community members to participate in these activities (Orfaly et al., 2005).

In our case, the physical education instructor of the Indigenous community, and two parents of youth who showed a high level of interest in the program were trained by researchers and given their initial coaching certificates in Olympic wrestling by the Newfoundland Amateur Wrestling Association (NLAWA). Bringing

in the NLAWA also worked to create a strong relationship between the NLAWA and the community, in fact the NLAWA supplied the initial wrestling mats required for the program to begin. This relationship supports sustainability allowing youth to know when tournaments occur and take advantage of funding opportunities from the NLAWA. Thus, the process of CBPR had extended past the researchers and the community; it had incorporated and built a strong lasting relationship within the Olympic wrestling community in NL.

Community of Practice

Literature regarding implementation suggests that in order to achieve sustainable change, concurrently building a community of practice (CoP) alongside a TTT course is essential, where a CoP refers to a group of people who share a common interest (Grealish el al., 2010; Linkewich & Fortin, 2013; Urquhart et al., 2013). Consistent with the CBPR framework used by Silvey's team: by sharing information and experiences within the group through a virtual CoP, individuals learned from each other and developed an identity as members of the group, helping to maintain the Olympic wrestling program.

The CoP was built using social media and networking (Facebook and YouTube) as age-appropriate tools that linked the youth with each other, their trainers, and members outside their community. The initial group consisted of both Indigenous and non-Indigenous wrestlers in Labrador and across Newfoundland, and gave the youth the opportunity to share photographs and training videos among several different wrestling clubs. The youth in this Indigenous community also became part of a national CoP when many attended the North American Indigenous

Games (NAIG) in July 2017. The 2017 NAIG staff created a Facebook group where all youth in all sports (including Olympic wrestling) could share videos and pictures from their competitions. This fostering of community created an atmosphere of success and a safe place for youth to share ideas that led to excitement and aided in keeping the program fresh and new. The CoP increased the reach of Silvey et al.'s (Submitted) research and allowed for the inclusion of more experts and participants of Olympic wrestling from around the country. The more knowledge that can be shared by participants the more likely one is to build a stronger project and lead to a more thorough examination of the project (Israel et al., 1998).

Holistic Health Measures

Following in the NCCAH Framework for Indigenous School Health, Silvey's team aimed to measure the holistic health of participants of the Olympic wrestling program. At the start of the program, mental and physical health were the main priorities. However, as the project and research progressed and communication increased between the research team, Indigenous community, and the Aboriginal Sport and Recreation Circle of Newfoundland and Labrador (ASRCNL) it became apparent that creating a positive program guided by the Framework for Indigenous School Health, required consideration of other areas of the youths' holistic health. Tools were created and used by the research group to examine the physical, mental, emotional, and spiritual health of participants. The tools created and used were surveys, one on one interviews with the youth, and photovoice as an evaluation tool.

Creation of Surveys/One on One Interviews

Israel et al. (1998) describes CBPR as a research process that includes the involvement of participants throughout the research project. Silvey's approach involved working with the Indigenous community and the ASRCNL to create two culturally appropriate surveys and interview questions to collect data about the Olympic wrestling program and the impacts on participating youth.

The first survey was used to determine if there were changes in the mental health of the Olympic wrestling program participants. A self-rated scale was created following the Kutcher Adolescent Depression Scale (KADS). The KADS has been shown to be a useful scale in the school setting, as it is time efficient, sensitive to change over time for each individual participant, and valid (Brooks. 2004; Ewa et al., 2015; LeBlanc, Almudevar, Brooks, & Kutcher, 2002). When discussing the KADS questionnaire with the community, the community leaders brought up concerns with some of the wording used in the answer options. It was important that the information gained was useful to the community and consistent with their principal beliefs. Therefore, small alterations were made to the wording used in the KADS questionnaire (Silvey et al., Submitted). The use of this scale not only helped researchers measure changes in the youth who chose to participate in the Olympic wrestling program; but also helped them measure the changes in the mental health of youth who did not participate in the program, as they served as a control group (Silvey et al., Submitted). Any signs of lower levels of mental health, or suicidal tendencies in any youth at the school were directly brought to the attention of the school guidance counselor by researchers to insure that their concerns could be

addressed. The research allowed for a high degree of communication between researchers, the Indigenous community, and the school. This allowed knowledge acquired during the research process to be used in a way that benefited the Indigenous community members.

The second survey and interview questions were created by the collaborating team and used to determine the impacts participation in the 2018 Newfoundland and Labrador Winter Games had on Indigenous youth. (Silvey, Buote, Donovan, & Dubrowski, 2018). The 2018 NL Winter Games were different from any past winter games held in any province across Canada, as these games were the first to give Indigenous youth the opportunity to compete under the banner of Team Indigenous. The ASRCNL asked Silvey's team to create tools to measure the impacts that the youths' competition in the games had on their holistic health. That the ASRCNL asked the team to complete this project was not only a privilege for the research team, but it also indicated that the relationship built between the research team and the ASRCNL had led to a greater understanding of the roles, expertise, and the potential for collaboration within this community of research and practice. The Indigenous community and the Indigenous sport community in NL had accepted Silvey et al. as a reliable and trusted resource. This not only gave the ASRCNL and Indigenous community a trusted ally, but it also made the researchers feel wanted and gave them the opportunity to learn more about working with Indigenous Peoples. It was important that the team not force their ideas onto the community but instead, show what they could do, and have the community contact them when they felt the researchers could be of use. This also made sure that the research was

relevant and respectful for participants. This falls inline with the CBPR approach in that a strong relationship was first developed before further research took place with the community members. This survey also asked youth specific questions related to their emotional and spiritual health, to determine if the games had a major impact on their health in a more holistic sense, working within the Indigenous School Health Framework (Silvey et al., 2018).

Photovoice

Indigenous voices are often buried deep and seldom heard in research conducted by non-Indigenous researchers (Kovach, 2009; McHugh et al., 2015; Wilson, 2008). In order to give participating youth a voice in the research program, Silvey, Donovan, and Dubrowski (Submitted) incorporated photovoice as a research tool. Photovoice is a qualitative tool often used in health research in order to give marginalized populations and youth a way to express their thoughts and feelings on a specific subject (Holtby, Klein, Cook, & Travers, 2015). Photovoice is a form of storytelling, which makes it an optimal tool for use within Indigenous methodologies. Many Canadian Indigenous cultures use storytelling as a way to pass on knowledge, thus the use of Photovoice can incorporate modern technology, Indigenous ways of knowing and non-Indigenous research (Beh, Bruyere, & Lolosoli, 2011; Castleden & Garvin, 2008; Wilson, 2008). As it pertained to Silvey's team's research, youth who participated in the Olympic wrestling program and the 2017 NAIG were asked to create and discuss a photographic essay about their wrestling journey. Giving the youth full control of the research documentation allowed researchers to see through the eyes and literal lens of these Indigenous youth

wrestlers. This active involvement directly related to the research project aligns with the CBPR framework and values the incorporation of Indigenous Knowledge into the research (Poudrier & Mac-Lean, 2009).

The youth were able to discuss the hardships of sport participation, and also the benefits. The youth in this study shared and discussed many of the meaningful experiences of the program that would have been difficult to collect using traditional Eurocentric research methods (Silvey et al., Submitted). Photovoice instilled in the youth a feeling of power and control, and allowed researchers to look into the complicated lives of these youth (Silvey et al., Submitted). Lastly, photovoice also created a relationship between researchers and youth, which is a strong marker of CBPR.

Conclusion

The results of Silvey's team's research have added to discussion about the benefits of Indigenous sports. This paper has taken the methods from each of the previous studies conducted by Silvey et al. (2016, 2018, 2018, Submitted, Submitted) and shown how care and intention grounded in CBPR and an Indigenous School Health framework when working with Indigenous communities can lead to a beneficial, positive, reciprocal relationship. Both the CBPR and NCCAH frameworks discuss the importance of the participating Indigenous community being involved in any intervention that is created to improve the health of community members. This is logical, as the communities themselves are experts in what colonialism has done to their homes and culture and they must lead work designed to mitigate the negative impact of this history. By respecting the participants' views and guidance in

the research process, researchers can help in decolonizing Eurocentric methodologies, and come to an understanding that helps national non-Indigenous policy makers and Indigenous communities concurrently.

Chapter 4: Manuscript 2

A utilization-focused evaluation of readiness for a wrestling program in the rural community of Conne River*, Newfoundland, Canada

*The settler name was used for this publication, however all other references to the Indigenous community outside of this chapter have been edited to represent the English version of the community name: Miawpukek First Nation.

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Abstract

Background: Youth participation in extracurricular activities such as wrestling has positive effects on their mental and physical health. However, these sports are not offered in many rural communities in Canada where youth physical and mental health is lower than Canadian urban communities.

Objectives/Purpose: To determine if an extracurricular wrestling program is perceived acceptable, feasible, and sustainable by the members of the highly successful, rural Aboriginal community of Conne River, Newfoundland and Labrador (NL), Canada.

Methods: A modified Delphi method was used to engage community stakeholders and experts from the fields of kinesiology, combat sports, and Aboriginal affairs to develop a survey to accurately determine the community of Conne River's needs, as well as factors contributing to building an acceptable, feasible, and sustainable wrestling program. The survey consisted of free text questions as well as a 5-point,

anchored Likert scale and was handed out to parents of youth attending the community school, the Band Council of Conne River, and school employees.

Results: There was a 62% response rate from participants. Average responses indicated a high level of agreement to the questions asked and indicated the program would be feasible and sustainable in the community. The parent group had the highest level of agreement in all categories while the teacher group was lowest in all categories except for questions related to the appropriateness of the program in the rural, aboriginal context.

Conclusions: The community of Conne River, NL is receptive to having a wrestling program implemented in their community and has the resources and motivation to make the program sustainable.

Background

Youth who do not participate in afterschool extracurricular activities, such as athletics, fine arts, and academic clubs have been shown to have a higher risk of engaging in unhealthy behaviors that could have detrimental effects during their time in school and after graduation (Broh, 2002; Darling, 2005; Eccles et al., 2003; Feldman & Matjasko, 2005; Fredricks & Eccles, 2006; Gardner, Roth, & Brooks-Gunn., 2008; Holland & Andre, 1987; Lareau, 2003; Mahoney, 2000; Mahoney & Cairns, 1997; Mahoney, Cairns, & Farmer, 2003; McNeal, 1995; Simpkins et al., 2005; Zaff, Moore, Papillo, & Williams., 2003). Several studies have shown that participation in extracurricular activities such as sports and fine arts can reduce low

levels of mental health, along with reducing the prevalence of school drop outs, substance abuse, and anti-social behaviors in youth (Bohnert & Garber, 2007; Busseri, Rose-Krasnor, Willoughby, & Chalmers, 2006; Darling 2005; Dotter et al. 2007; Gilman, Myers, & Perez, 2004; Mahoney, 2000). The skills that students learn in extracurricular activities such as physical and social competency, self-management, integrity and respect, goal-setting, decision-making, communication and teamwork are typically carried well beyond those learned in the classroom (Weiss & Wiese-Bjorns, 2009). By being part of a group or club students gain a sense of belonging and community that has shown to have positive benefits in school commitment (i.e. attendance and work ethic) and achievement, and promotes healthy choices (Eccles et al., 2003; Marsh & Kleitman, 2002).

As it relates specifically to sports, literature suggests that involvement in afterschool activities increases youth's' levels of self-esteem (Daniels & Leaper, 2006; Erkut & Tracy, 2002; Holland & Andre, 1994; Tracy & Erkut, 2002) by providing a context for self-assessment outside of the norms of school and family life (Barber et al., 2001). This increased level of self-esteem has been shown to carry into adulthood and can prevent problems such as life dissatisfaction, physical health problems, depression, substance abuse, suicidal behavior, and aggressive behavior (Crocker & Wolfe, 2001; Kort-Butler & Hagewen, 2011; Trzesniewski, Donnellan, & Robins, 2003). Although the positive effects of sports on the future development of students as highly functioning individuals has been demonstrated numerously, in certain populations, access to sports such as hockey, basketball, football, and soccer

is limited or prohibitive due to high costs of participation (i.e.: costs of purchasing equipment or rink/court/field time) (Humbert et al. 2006).

Combat sports such as wrestling increase self-esteem like other sports, however it is also highly accessible (Hanson et al., 2001; Oh et al., 2015; Rachele et al., 2014; Sibold et al., 2015; Silvestri, 1997; Warner & Dixon, 2013). In wrestling there is no gender bias (girls compete against girls and boys compete against boys, but they train together), there is no required level of socioeconomic status because both use little or no equipment (individuals can wrestle in any style of clothing); and they do not require any particular genetic or physical criteria due to separate weight classes for competition (Channon, 2014; Hayhurst, 2014; Kamble et al., 2015; Ousley et al., 2013; Pettersson et al., 2013; Terry, Hahn, & Simjanovic 2014; Velija, Mierzwinski, & Fortune, 2013; Woodland, 2009). This inclusiveness makes combat sports, such as wrestling a positive candidate for a highly accessible extracurricular program.

Youth from rural, Aboriginal, and remote communities, such as those in Newfoundland and Labrador often face a lack of afterschool sport activities (Newfoundland and Labrador Poverty Reduction Strategy Progress Report, 2014; Provincial Wellness Review, 2014; UNICEF Report Card, 2016). Frequently these communities do not have the infrastructure to support team sports such as hockey, basketball, football, and soccer. In addition, these communities also lack the numbers of students who would be willing to participate to make up the teams. Thus youth are often criticized for not engaging in sport activities, yet in rural, Aboriginal, and remote communities it is often the lack of infrastructure and

number of students able to participate in organized programs that are the limiting factors (Roth & Brooks-Gunn, 2003). Furthermore, in rural communities and Aboriginal communities in Canada there are fewer extracurricular activity programs offered due to a lack of facilities, lower household income, lack of volunteers, and/or little community cohesion (Clark, 2008; Guèvremont et al., 2008; Hoefer, McKenzie, Sallis, Marshall, & Conway, 2001; Huebner & Mancini, 2003; La Torre et al., 2006; Offord et al., 1998; Simpkins et al., 2005; Wen et al., 2007; White & Gager, 2007; Wimer et al., 2008; Xu, Gauthier, & Strohschein, 2009).

Currently, a shift in the paradigm of thinking is occurring and schools and community centers are offering more afterschool activities. However, many new programs that are implemented often fail due to a lack of youth participation (Roth & Brooks-Gunn, 2003). The unwillingness to participate, or high drop-out rates are due to several factors, such as the programs not being offered on a regular basis during the same time and days, the goals of the programs are not laid out before the programs begin, the youth are not challenged enough, or a lack of coordination with the community and implementers of the program (Roth & Brooks-Gunn, 2003). Before spending large amounts of time and money in implementing an extracurricular program, the program must first be evaluated by all interested parties to determine if the community is prepared to work with implementers to insure program sustainability.

The purpose of this study was to determine if an extracurricular after school wrestling program would be acceptable, feasible, and sustainable in the highly successful, rural Indigenous community of Conne River, Newfoundland and

Labrador (NL), Canada. Specifically, the objectives of the study were first to create and validate a survey tool using the Delphi method, and second, to use the tool to determine the acceptability, feasibility and sustainability of an extracurricular after school wrestling program in Conne River, NL, Canada.

Methods

Prior to starting the study, ethics approval was obtained from the Health Research Ethics Board, of Newfoundland & Labrador (reference number: 15 245). The Conne River, NL Band Council, granted permission and participant consent was informed and implied through the return of a completed survey. Results of all phases will be discussed in the results section of this paper.

Phase 1: Panelist Selection

The goal of the first phase of this study (Panelist Selection) was to recruit a representative sample of highly trained experts with first-hand knowledge of the content domain, whose opinions were respected by their peers (Clayton, 1997; Fink et al., 1984; Hsu & Sandford, 2007; de Villiers et al., 2005) for subsequent expert consensus building exercise (Phase 2: Survey Development). 'Experts' were defined as practicing provincial school educators, individual Aboriginal people that are currently active members of their community, elite level combat sport coaches, and kinesiology researchers at the university level. The panel was restricted to current active Aboriginal community members, educators, and coaches because the authors felt their responses would incorporate relevant ideas about what Aboriginal youth are in need of, and reference school curriculums in their responses.

Prospective panelists were identified through purposive sampling to determine the initial panelist (Morgan, Lam-McCulloch, Herold-McIlroy, & Tarshis, 2007) after which a 'snowball' technique was used to ensure adequate representation of the individuals that would understand the practicalities of the implementation of a wrestling program (Penciner et al., 2011; Valente & Pumpuang, 2007). Specifically, key informants (elite combat sport participants, university professors, high school teachers, and Aboriginal community members) were asked to nominate individuals considered to be experts based on the aforementioned criteria (Clayton, 1997). Each nominee was contacted electronically, provided with a letter detailing the purpose, methods and anticipated time commitment of the study, and asked to participate if he or she was able to complete all survey rounds.

Although there is no consensus on an appropriate panel size for a Delphi process, (Hsu & Sandford, 2007) a sample of 10-15 is considered adequate for most purposes (Gustafson, 1975) and most authors recommend using the minimal number of participants required to balance representativeness and the likelihood of participants completing all survey rounds (Hsu & Sandford, 2007; de Villiers et al., 2005). In this study, recruitment continued until a minimum of three panelists from each specialty (12 panelists in total) agreed to participate. Each of these individuals was provided with a unique subject identification number to ensure that each person's identity remained confidential throughout the Delphi process.

Four initial panelists were identified, one from each of the four key areas (Aboriginal communities, elite combat sport athletes/coaches, university professors,

and high school teachers). They each then provided additional panelists from their areas until the final panel was formed, which consisted of 12 panelists, three high school teachers, three combat sport athletes/coaches, three active Aboriginal community members, and three university professors.

Phase 2: Survey Development/Modified Delphi Method

The aim of this phase was to use a modified Delphi method to develop and refine a Utilization-Focused Evaluation (UFE) (developed by: Michael Quinn Patton, 2012) survey that would be used to evaluate the Aboriginal communities' contextual factors influencing readiness for the program, existing infrastructure and process, as well as expected results if such a program was to be established.

Item Generation

The initial idea for the wrestling program was based on other recreational and elite level wrestling programs that are currently offered in urban areas in Canada and would have elements of wrestling and conditioning. Theories gained from examining current programs were then taken to the community of Conne River on March 31st 2015, and the authors discussed the program with stakeholders in the community. In accordance with the modified Delphi method (Graham, Regehr, & Wright, 2003; Hsu & Sandford, 2007; de Villiers et al., 2005) the authors used the previous information gained to generate an initial list of items to be presented to Delphi panelists. The initial set of survey questions was compiled based on Stufflebeam's (1983) Context, Input, Process, and Product (CIPP) model (Hakan &

Seval, 2011). The total of number of questions in each of the CIPP areas were: Context = 8, Input = 6, Process = 10, Product = 6 for a total of 30 initial questions to be evaluated.

Survey instrument

The survey website "FluidSurveys" was used by the authors to house the structured electronic questionnaire and record the data. The survey began with a detailed set of instructions, panelists were then asked to rate their level of agreement with the inclusion of each of the 25 questions in the item on a 5-point Likert scale, where 5 indicated strong agreement that the item was relevant to the purpose of the study and 1 indicated a strong disagreement that the item was relevant. Free-text boxes were provided after each condition and at the end of each section to allow panelists to comment, add, or suggest revisions to the listed items.

Modified Delphi Method

The structured questionnaire was presented electronically to the expert panel in multiple iterative rounds (Hsu & Sandford, 2007; de Villiers et al., 2005). In round one, panelists completed all parts of the questionnaire, identified additional questions that were not included in the item, and suggested revisions to the wording of questions that were ambiguous or confusing. In round two, panelists were sent a revised version of the questionnaire that included suggested additions and revisions, and were instructed to rate the conditions again. If their ratings deviated from the group mean by more than 20%, they were also asked to provide a brief

comment outlining their reasons for remaining outside the consensus (Hsu & Sandford, 2007; Lambe & Bristow 2010; Scavone et al., 2006). Weekly reminders were sent to panelists who had not completed the questionnaire after one week until panelists responded.

All statistical analyses were conducted using Excel for Mac 2011 (Microsoft, Redmond, WA, USA). The opinions of all panelists were weighed equally. After each round, the panel's mean ± SD response was calculated for each condition. A final list of the questions to be included in the final item is presented in the results.

In this study, consensus was defined based on the homogeneity or consistency of opinion among panelists across survey items, which was quantified using a an SD < 1. If the SD was > 1 then it was determined that the question was not clear to all members of the panel and was reworded based on feedback or removed. Finally, the panel's mean ratings for each question were calculated to determine the relationship between panelists' ratings of each question. Questions were kept in the survey if their mean score of all panelists' answers was > 3.5. The values of these measures observed in each round of the survey are reported in Table 1 and Table 2 to demonstrate the degree of consensus throughout the Delphi process.

The process was terminated after the second round, as the minimum consensus criterion was achieved, and only minor changes in panelist responses between rounds one and two of the survey were observed.

Phase 3: Survey

Between December 12th, 2015 and January 21st, 2016, individuals that were part of our three specific categories and were living in the community of Conne River Newfoundland, Canada (Miawpukek First Nation) were invited via the call out program Synrevocie to come to the local school to complete the survey assessing the sustainability of a wrestling program in their community. Employees of the local private school (St Anne's School) completed the surveys (n=18) as did all Band Council members (n=5) and several parents with eligible youth (total of 54 eligible youth) attending the school (n=8). The survey was given out to 8.3% of total population of Conne River who were selected for being in one of the three categories of stakeholders vital to the program: school employees, parents of youth that were eligible to participate in the program, and Band Council members of the community. A total of 31 people out of 50 (response rate of 62% and 5.2% of the total population) completed the survey. Descriptive statistics were used to summarize the findings of the survey and to provide data on the feasibility and sustainability of a wrestling program. Each group (school employees, band council members, and parents) was analyzed separately and all groups were then analyzed as one.

Analysis

Phase 1: Panellist Selection

This phase did not require any statistical analyses.

Phase 2: Delphi method

Descriptive statistics (mean and SD) for each of the questions, in each of the rounds were calculated using Statistical Package for the Social Sciences (SPSS) software.

Phase 3: Survey

Questions were grouped into four categories based on subject matter: Context, Input, Process, and Product. A mean score for each category was created for each participant by summing responses and dividing by the number of questions answered by that participant. The mean was calculated from one to five with a mean closer to one being representative of a prepared community and a score closer to five being representative of an unprepared community. If a participant did not answer a minimum of half the questions in a given category, their data was removed for that category.

Four separate one-way analyses of variances (ANOVAs) were performed to compare mean scores of each category between participant groups (School Employees, Parents, and Band Council) to determine if there were any significant differences between groups on any of the measures. Bonferroni corrections were applied to control for multiple comparisons.

Results

Phase 2: Modified Delphi Method

All 12 of the panelists completed Round One of the Delphi process and ten (83%) completed Round Two. As seen in Table 1, following Round One, three questions were removed, one due to lack of importance (Mean < 3.5), and two were

removed due to having both a high level of ambiguity (SD > 1) and panelist comments. Four questions were reworded due to having high levels of ambiguity (SD > 1).

Table 1. Results of round one of the modified Delphi Method.

Category	Question	Overall *M* (*SD*)
Context	Do you believe that some individuals in the community may be prevented from being physically active due to a lack of activity choices?	**3.17 (1.47)
	Do you believe that some individuals in the community may be prevented from being physically active due to a lack of facilities?	3.9 (0.9)
	Do you believe that some individuals in the community may be prevented from being physically active due to a lack of coaches/instructors?	4.43 (0.54)
	Do you believe this program would be successful with youth in the community?	4.5(0.55)
	Do you believe this program would be successful with adults in the community?	4.3 (0.82)
	How comfortable are you with the physical contact being made in the sports that are taught in this program? For example: takedowns to the mat, light contact punching	4.43 (0.79)
	What are some potential issues that may prevent the success of this program?	4.7 (0.52)
	The main goal of this project is to get as many people as possible to be physically active. Do you feel the community has any other needs that could be addressed by this program?	**3.8 (1.17)
Input	What do you believe would be an appropriate cost to the community for this program (per year)?	**3.5 (1.31)
	What do you believe would be an appropriate cost to your family for this program (per month)?	**4 (1)

	Do you believe having community members volunteer with the program will make the program more sustainable?	4.42 (0.79)
	Do you believe this program would make the best use of resources in the community?	3.86 (1.07)
	Do you believe it would be worthwhile for the community to fund this program?	4.43(0.54)
	Do you believe that the physical education instructor in Conne River would be the appropriate person to lead this program?	**3.7 (1.21)
Process	What age range do you feel this program would most benefit?	**4 (1.69)
	Do you think that conducting simple physical testing before and after this program is appropriate?	4.14 (0.69)
	Do you think that conducting simple mental well-being testing before and after this program is appropriate?	4.14 (0.69)
	Do you believe that using participation numbers, physical activity testing, and mental well-being testing is a good way to measure the success of the program?	3.71 (0.95)
	If participants would like to compete in tournaments or matches, a physical examination is required. Do you believe the Health Care Centre in Conne River would be able to conduct these examinations?	3.7 (0.95)
	Do you believe having this program run out of the community centre/school allows it to reach those who most need it?	4.7 (0.52)
	If this program is found to be successful, do you believe it should be continued?	**3.6 (1.67)
	How much time would you be willing to volunteer to help with this program?	4.7 (0.52)
	Would you be willing to get certified in order to help coach combat sports in Conne River?	*3.7 (1.37)
	Do you believe that combat sports should be offered as part of a regular physical education program in the school?	**4 (1.10)
Product	Do you believe that if designed and implemented properly this program will:	4.14 (0.69)

	help meet the physical fitness needs of the population in Conne River?	
	Do you believe that if designed and implemented properly this program will: help increase the mental health of the population in Conne River?	4.14(0.69)
	Do you believe that if designed and implemented properly this program will: help improve the academic performance of the youth in Conne River?	3.71 (0.76)
	Do you believe that if designed and implemented properly this program will: help improve the sense of student community in Conne River?	4.43 (0.54)
	Improvements in physical activity such as weight loss, cardiovascular improvements, etc., will be an outcome of this project	4.57(0.54)
	Do you believe that improvements in mental well-being such as, lower levels of depression, higher levels of motivation, etc. would be important outcomes in this project?	4.42 (0.54)

* Questions removed due to mean < 3.5
** Questions reworded due to SD > 1
^ Questions removed due to comments from panelists

As seen in Table 2 after the completion of Round Two, four questions were removed due to lack of importance (Mean < 3.5), one question was reworded due to a high level of ambiguity (SD > 1), two questions were removed due to panelist comments, and one question was split into three questions in order to allow for a more concise response.

Table 2. Results of round two of the modified Delphi Method.

Category	Question	Overall *M* (*SD*)
Context	There is a lack of activity choices in Conne River.	3.78 (0.71)
	Some individuals in the community may	4.5 (0.54)

	be prevented from being physically active due to a lack of facilities (ice rink, football field, etc.).	
	Some individuals in the community may be prevented from being physically active due to a lack of trained coaches/instructors.	3.89 (0.74)
	This program will be sustainable and have positive impacts on youth within the community of Conne River?	4 (0.54)
	This program will be sustainable and have positive impacts on adults within the community of Conne River?	4.57 (0.54)
	How comfortable are you with the physical contact being made in the sports that are taught in this program? For example: takedowns to the mat, light contact punching.	4.6 (0.74)
	What are some potential issues that may prevent the sustainability and positive outcomes of this program?	3.75 (0.71)
Input	This program is worthwhile for the community to fund.	4 (0.76)
	What would be an appropriate cost to the community of Conne River to contribute for this program??	*3.38 (0.93)
	What would you be willing to pay to have a member of your family participate in this program?	*3.38 (0.93)
	This program would make the best use of resources in the community.	4.25 (0.71)
	As the physical education instructor and a former combat sport competitor, Mr. Paul McDonald would be the appropriate person to lead this program.	**3.63 (1.51)
Process	What age range do you feel this program would most benefit?	*3.38 (0.93)
	Conducting simple physical fitness testing such as, a grip test, number of push-ups in 1 minute, etc., before, during and after this program is appropriate.	3.88 (0.49)
	Conducting a simple mental health questionnaire (11 questions) before, during and after this program is appropriate.	3.86 (0.54)

	Using participation numbers, physical fitness tests, and mental well-being tests is a good way to measure the impact of the program.	4.25(0.46)
	Do you believe having this program run out of the community centre/school allows it to reach those who most need it?	4.25 (0.71)
	How much time would you be willing to volunteer to help with this program?	**4.13 (1.13)
	Would you be willing to get certified in order to help coach combat sports in Conne River?	3.89 (0.74)
	Combat sports should be offered as part of a regular physical education program in the school	4 (0.93)
	Community members volunteering with the program will make the program more sustainable.	**4.5 (1.17)
Product	Do you believe that if designed and implemented properly this program will: help meet the physical fitness needs of the population in Conne River?	4.5 (0.54)
	Do you believe that if designed and implemented properly this program will: help increase the mental health of the population in Conne River?	3.78 (0.71)
	Do you believe that if designed and implemented properly this program will: help improve the academic performance of the youth in Conne River?	**4.13 (1.5)
	Do you believe that if designed and implemented properly this program will: help improve the sense of student community in Conne River?	4.25 (0.89)
	Improvements in physical activity such as weight loss, cardiovascular improvements, etc. will be an outcome of this project?	3.89 (0.74)
	Improvements in mental well-being such as, lower levels of depression, higher levels of motivation, increased level of self-esteem etc. would be an important outcome of this project?	4.13 (0.64)

* Questions removed due to mean < 3.5

** Questions reworded due to SD > 1

^ Questions removed due to comments from panelists
^^ Questions reworded due to comments from panelists

The final survey following the CIPP model consisted of 23 questions: context = 7, Input = 3, Process = 8, Product = 5 (Table 3). Only minor modifications to the questions were made based on the participants' written feedback. Because the minimum criteria were met after round two, the final survey was not circulated for round three.

Table 3. Final survey questions resulting from modified Delphi Method.

Category	Question
Context	1. There is a lack of activity choices in Conne River.
	2. Individuals in the community are prevented from being physically active due to a lack of facilities (Ice rink, football field, etc.).
	3. Individuals in the community are prevented from being physically active in different activities due to a lack of trained coaches/instructors.
	4. This program will be sustainable and have positive impacts on youth within the community of Conne River.
	5. This program will be sustainable and have positive impacts on adults within the community of Conne River.
	6. How comfortable are you with the physical contact being made in the sports that are taught in this program? For example: Take downs to the mat, light contact punching.
	7. What are some potential issues that may prevent the sustainability and positive outcomes of this program?
Input	8. This program is worthwhile for the community to fund.
	9. This program would make good use of the resources in the community.
	10. As the physical education instructor and a former combat sport competitor Mr. Paul McDonald would be the appropriate person to lead this program. If not, whom would you recommend?
Process	11. Conducting simple physical fitness testing such as a grip test, number of push ups in 1 minute, etc. before, during, and after this program would be helpful in determining the effects the program has had on youth.
	12. Conducting a simple mental health questionnaire (11 questions) before, during, and after this program would be helpful in determining the effects the program has had on youth.
	13. Using participation numbers is a good way to measure the

	impacts of the program.
	14. Using physical fitness tests is a good way to measure the impacts of the program.
	15. Using mental health tests is a good way to measure the impacts of the program.
	16. Do you believe having this program run out of the community centre/school allows it to reach those who need it most?
	17. Would you be willing to get coaching certified in order to help coach combat sports in Conne River? Certification would require a full weekend course at no cost to you.
	18. Combat sports should be offered as a part of a regular physical education program in the school
Product	19. Do you believe that if designed and implemented properly this program will help improve the academic performance (attendance and participation in school) of the youth in Conne River?
	20. Do you believe that if designed and implemented properly this program will help improve the sense of student community (student family) in Conne River?
	21. Do you believe that if designed and implemented properly this program will Community members volunteering with the program will make it more sustainable.
	22. Improvements in physical activity such as weight loss, cardiovascular improvements, etc., will be an outcome of this project.
	23. Improvements in mental health such as, a lower level in depression, a higher level of motivation, increased level of self-esteem, etc. will be an outcome of this project.

Phase 3: Survey Results

The final survey was sent out to three groups (school employees, parents, and band council) equaling a total of 8.4% of the total population of Conne River (595 individuals) and among all three groups there was a response rate of 62% (5.2% of the total population). Mean responses by category and participants are shown in Table 4. Average responses range from 1.35-2.07 indicating a high level of agreement to the questions asked in the survey. The parent group had the highest level of agreement in all categories (context = 1.70, input = 1.58, process = 1.91, and product =1.35) while the teacher group was lowest in all categories except for

context (teachers =1.84, band council members = 1.87). One-way ANOVAs were used to compare the three participants groups (school employees, parents, and band council) on the four question categories (context, input, process, and product). Results showed no significant differences in the context, input, and process category at $p < .05$ (Context $F_{(2,28)} = .301$, $p = .742$; Input $F_{(2,28)} = 1.168$, $p = .326$; Process $F_{(2,28)} = 1.087$, $p = .351$). There were significant differences found between participant groups in the product category (Product $F_{(2,28)} = 3.751$, $p = .036$). A Bonferroni correction was applied, which showed no significant differences in the product category between band council ($M = 1.52$, $SD = 0.438$) and either other participant group, but parents ($M = 1.35$, $SD = 0.351$) answered significantly more positively than teachers ($M = 1.77$, $SD = 0.358$).

Table 4. Average response for each question category by participant group.

Group	Context *M* (*SD*)	Input *M* (*SD*)	Process *M* (*SD*)	Product *M* (*SD*)
Teachers (n = 18)	1.84 (0.436)	1.91 (0.425)	2.07 (0.302)	1.77 (0.358)
Parents (n = 8)	1.70 (0.538)	1.58 (0.707)	1.91 (0.272)	1.35 (0.351)
Band Council (n = 5)	1.87 (0.298)	1.87 (0.380)	1.95 (0.143)	1.52 (0.438)
Overall (n = 31)	1.81 (0.437)	1.82 (0.508)	2.01 (0.278)	1.62 (0.401)

As seen in Table 5 all response range from 1.1 to 3.1 showing a high degree of agreeability. The lowest agreeability was seen when participants were asked "Would you be willing to get coaching certified in order to help coach combat sports in Conne River?" The highest agreeability scores were seen during questions of outcomes of the implementation of the program.

Table 5. Mean Responses for each question separated into groups of School Employees (S.E.), Parents (P), Band Council (B.C.), and an overall score.

Category	Question	Overall *M* (*SD*)	S.E. *M* (*SD*)	P. *M* (*SD*)	B.C. *M* (*SD*)
Context	There is a lack of activity choices in Conne River.	1.5 (0.68)	1.6 (0.78)	1.3 (0.46)	1.8 (0.45)
	Individuals in the community are prevented from being physically active due to a lack of facilities (Ice rink, football field, etc.).	1.6 (0.56)	1.6 (0.50)	1.3 (0.46)	2.0 (0.71)
	Individuals in the community are prevented from being physically active in different activities due to a lack of trained coaches/instructors.	2.1 (0.99)	2.2 (1.10)	2.1 (0.99)	2.0 (0.71)
	This program will be sustainable and have positive impacts on youth within the community of Conne River.	1.8 (0.72)	1.8 (0.81)	1.8 (0.71)	1.8 (0.45)
	This program will be sustainable and have positive impacts on adults within the community of Conne River.	1.9 (0.64)	2.0 (0.71)	1.9 (0.64)	1.8 (0.45)
	How comfortable are you with the physical contact being made in the sports that are taught in this program? For example: Take downs to the mat, light contact punching.	1.9 (0.53)	2.0 (0.61)	1.9 (0.38)	1.8 (0.45)
Input	This program is worthwhile for the community to fund.	1.7 (0.51)	1.8 (0.38)	1.5 (0.76)	1.8 (0.45)
	This program would make good use of the resources in the community.	1.9 (0.75)	2.1 (0.73)	1.5 (0.76)	2.0 (0.71)
	As the physical education instructor and a former combat sport competitor Mr. Paul McDonald would be the appropriate person to lead this program.	1.6 (0.50)	1.6 (0.51)	1.5 (0.55)	1.8 (0.45)
Process	Conducting simple physical fitness testing such as a grip test, number of push ups in 1 minute, etc. before, during, and after this program would be helpful in determining the effects the program has had on youth.	2.0 (0.41)	2.1 (0.42)	1.8 (0.46)	2.0 (0.00)
	Conducting a simple mental health questionnaire (11 questions) before, during, and after this program would be helpful in determining the effects the program has had on youth.	1.8 (0.45)	1.8 (0.38)	1.9 (0.64)	1.8 (0.45)
	Using participation numbers is a good way to measure the impacts of the program.	2.0 (0.68)	1.9 (0.47)	2.3 (1.16)	2.0 (0.00)
	Using physical fitness tests is a good way to measure the impacts of the program.	1.8 (0.45)	1.9 (0.47)	1.6 (0.52	2.0 (0.00)

	Using mental health tests is a good way to measure the impacts of the program.	2.0 (0.45)	1.9 (0.42)	2.0 (0.53)	2.2 (0.45)
	Do you believe having this program run out of the community centre/school allows it to reach those who need it most?	1.8 (0.64)	1.8 (0.73)	1.6 (0.53)	1.8 (0.45)
	Would you be willing to get coaching certified in order to help coach combat sports in Conne River? Certification would require a full weekend course at no cost to you.	2.8 (1.17)	3.1 (1.39)	2.7 (0.82)	2.2 (0.45)
	Combat sports should be offered as a part of a regular physical education program in the school	2.0 (0.74)	2.2 (0.75)	1.5 (0.55)	1.6 (0.55)
Product	Help improve the academic performance (attendance and participation in school) of the youth in Conne River?	1.7 (0.73)	1.9 (0.76)	1.5 (0.53)	1.6 (0.89)
	Help improve the sense of student community (student family) in Conne River?	1.7 (0.51)	1.9 (0.42)	1.4 (0.52)	1.6 (0.55)
	Community members volunteering with the program will make it more sustainable.	1.6 (0.49)	1.7 (0.46)	1.5 (0.53)	1.6 (0.55)
	Improvements in physical activity such as weight loss, cardiovascular improvements, etc., will be an outcome of this project.	1.4 (0.50)	1.6 (0.51)	1.1 (0.35)	1.2 (0.45)
	Improvements in mental health such as, a lower level in depression, a higher level of motivation, increased level of self-esteem, etc. will be an outcome of this project.	1.6 (0.50)	1.7 (0.46)	1.3 (0.46)	1.6 (0.55)

Question 7 was answered via a written response and answers are given in Table 6. A total of 14 school employees responded to the question, five parents responded and one band council member.

Table 6. Answers to Question 7 separated by group: "what are some potential factors that may prevent the sustainability and positive outcomes of this program?"

Group	Response
School Employees	- The right people running the program - Maintaining interest/participation, cost, trainers - Initial cost set up - Attendance and attitudes - Parents thoughts on the “danger” of the sport, and parents not wanting their children to get hurt - Lack of volunteers, lack of funding and lack of interest - Community support - Funding and group leaders to ensure the program is

	promoted and run properly - Worn out equipment or lack there of - Positive outcomes would be to run it out of the school for students, and the community center for adults - Lack of positive PR in its promotional stage. Lack of consistent encouragement from all community and family sources - Injuries, people's feelings of "personal space" and over protective parents - Cost, and participation numbers/student involvement - Money may be a problem for some
Parents	- Possibly interest, or parent supporters (i.e. volunteers) - Parental involvement - Lack of participation - Lack of parental support - Commitment of people and volunteer and the program's continuation. Funding
Band Council	- Scheduling is very important. I believe if it were incorporated into the actual program it would be sustainable. Volunteers would also be another major component in determining the success of the program

Discussion

The most important finding of the present study is that the residential stakeholders of Conne River, NL, Canada do agree that a wrestling program is needed, feasible, and would be sustainable after implementation in the community. The second finding is that a modified Delphi method was successful in creating and validating a survey tool in order to determine the first finding.

In urban and rural environments alike, new extracurricular school programs often face many challenges. For example, finding coaches for the programs can be difficult (Magnotta, 1990). When more youth want to participate in programs this requires more supervising and coaching staff, and the responsibility of these roles usually fall on school employees. Magnotta (1990) found that school employees are often not compensated for giving up their after school time, or for the weekends

during which competitions can occur. School employees feel that giving up their free time can affect preparation for classes and prevent their own leisure activities. With fewer school employees willing to take on the roles of coaches/supervisors, many schools have started hiring coaches from outside sources. However, this solution often generates another challenge; funding. Without the necessary funding to initiate the program and to increase funding as the program grows the program may fail (Parent & Harvey, 2016; Stott, 2013). In addition, if an extracurricular activity is developed and implemented by an external body, such as the government, university, or school board without proper early engagement with the school, the program is more likely to encounter challenges (Parent & Harvey, 2016). Rather than work on a top down approach Mintzberg (2006) recommends using a bottom up approach. This approach allows for external bodies and internal stakeholders to communicate and build the program to fit the needs of the stakeholders. In order to have a successful and sustainable program it is important to have coaches, volunteers, and funding set up prior to implementation and it is vital to have the community involved during the creation, implementation, and evaluation of the program (Secret, Abell, & Berlin, 2011). Thus in order to ensure participation early on from stakeholders and to create a successful and sustainable program a bottom up approach was used in this study. We have used a Utilization-Focused Evaluation (UFE) and the elements of Context, Input, Process, and Product (CIPP) to develop the program in a way that was best fitting with the community. To achieve this the stakeholders of the program located in the community of Conne River, NL were asked what they want, how it will fit in with the local context, what resources and

processes will be required and if they are available, and finally, what would be the measures of success that would help determine if the program is matching the vision the community had of the program.

All three groups surveyed had a high level of agreement in all four categories: context, input, process, and product. This suggests the survey responders believe the wrestling program will be sustainable and are willing to help make this happen. There were no differences in the three categories of responders in how they perceived the best way to build and implement the program. The parent group had the highest level of agreement in all categories and comments given about the program from parents were positive. A significant difference found between school employees' and parents' responses in the product category could be linked to the fact that many school employees have been shown to have little interest in coaching or teaching after school activities. As mentioned previously Magnotta (1990) suggests that this is due to three reasons, a lack of remuneration for additional hours worked, teachers not wanting to give up their weekends to attend competitions, and also many teachers do not feel they have the skills to coach or teach an extracurricular activity. Thus a "Train the Trainer" model would be best to instruct volunteers/coaches from the community who may or may not work in the school system but still are stakeholders (IE. Parents of youth attending the school) on how to coach wrestling and would initiate change while simultaneously building both capacity and sustainability (Orfaly et al., 2005).

Thematic analyses of free text comments (Question 7) revealed a number of possible local barriers to the success of the program. The major issues individual's

surveyed brought up were, youth interest, lack of volunteers/coaches, and funding. This agrees with both Magnotta (1990) and Parent and Harvey (2016) when they discuss the importance of having several volunteers and sustainable funding prior to implementation. Also, if the program is not run during regular intervals, youth will lose interest due to a lack of consistency and reliability (Roth and Brooks-Gunn, 2003).

The second main finding of this study was that the modified Delphi method allowed for the authors to develop a tool to be used to gain stakeholder input that was accurate and had been reviewed by experts, thus creating a far superior tool than was created by the authors themselves (Hsu & Sanford, 2007). The panel of experts examined the survey through the modified Delphi method to refine the survey and make it concise and easily understood. The removal of seven questions made the survey more easily understood and geared the survey to the important issues surrounding the program.

Limitations

Limitations to this survey first include only surveying 5.2% of the total populations due to limiting our participants based on being part of three cohorts (parents, school employees and band council members). Of these three cohorts we had a response rate of 62%. The information that could have been gained by the remaining 38% may have been useful in helping us determine a more accurate picture of what exactly the community of Conne River NL wanted/needed. It is also important to stress that these results cannot be generalized for any rural or Aboriginal community in Newfoundland and Labrador. Each community has its own

specific needs and these needs should be examined before making any assumptions of what the community requires or is interested in receiving. However, the model used in this study is transferable to other communities as long as the specific needs of those communities are the ones being examined and the survey is adapted to those needs.

Secondly, the use of a modified Delphi Method may have allowed for bias to be introduced into the initial survey given to the panel. There were also only two rounds of review conducted by the panel. While literature suggests three rounds is optimal, due to time constraints and an agreement across the panel for all questions the Delphi process was stopped after only two rounds (Goel, Kumar, Lal, Sharma, & Singh, 2013).

Conclusion

Based on the information gained in this study, an extracurricular wrestling and program is perceived as acceptable, feasible, and sustainable by the members of the community of Conne River, NL, Canada and the community of Conne River, NL, Canada has the resources and motivation to make the program sustainable. Through the survey that was successfully created via a modified Delphi Method, the community demonstrated their understanding of what would be required to implement and sustain the wrestling program in their community and suggests they are willing to do what it takes to keep the program sustainable. This understanding and willingness within the community should allow implementers from outside and inside the community to avoid the pitfalls that cause many programs to fail during the early stages of implementation.

Chapter 5: Manuscript 3

The impact of a youth Olympic wrestling program in a rural Indigenous community

Abstract

Background: Indigenous youth suffer from lower levels of mental and physical health than non-Indigenous youth. Physical activity (PA) has shown to have many physical and psychological benefits. While these benefits are well established, there is evidence that many Indigenous and non-Indigenous youth do not engage in enough PA for healthy development due to several barriers. Olympic wrestling is highly accessible in terms of inclusivity to youth due to a lack of gender, size, and economic barriers that are found in many other sports. However, Olympic wrestling is not offered in many rural and Indigenous communities in Canada where youth physical and mental health is lower when compared to Canadian urban communities.

Objectives/Purpose: To determine if a pilot project extracurricular Olympic wrestling program implemented in the rural Indigenous community of Miawpukek First Nation (Conne River) Newfoundland, Canada would have a positive effect on the physical and mental health of Indigenous youth who participated.

Methods: The program was implemented using a Train the Trainer model in which the Physical Education Instructor and volunteers were trained in how to coach Olympic wrestling throughout the entirety of the program. The program was run for

two hours, three times per week for a total of ten weeks. Physical health tests and a mental health survey were completed by the youth prior to the start of the program, as well as after the program was completed, and a retention test was given 15 weeks after completion.

Results: A total of nine youth participated in the program regularly. When compared to their peers that did not participate (n=19), these nine had non-significant increases, in both their cardiovascular endurance (p= 0.109), as measured by the beep test, their lower body endurance as measured by the wall-sit test (p=0.166), and their flexibility (p=0.175), as measured by the sit and reach test. There was not a significant change in the mental health of the youth (p=0.819) Effects sizes were also calculated but did not produce any significant data.

Conclusions: The Olympic wrestling program was implemented in the community of Miawpukek First Nation (Conne River) Newfoundland, Canada. Youth who participated had improvements, albeit non-significant in cardiovascular fitness, lower body muscular endurance, and flexibility when compared to those that chose not to participate. These results suggest that offering Indigenous youth additional sport activity choices may increase participation and help these youth increase their physical health to a greater extent, but more research is needed to refine the program. With the completion of this pilot program the aim of this project now is to have a similar offering run for a more extended period of time in more remote Indigenous communities in Labrador.

Introduction

The prevalence of obesity within youth populations is much greater in rural Canada and in Indigenous communities (Katzmarzyk, 2008). These same Indigenous youth often suffer from poor physical and mental health and rates of suicides are much higher in these areas as compared with urban areas of Canada (Lehti, Niemelä, Hoven, Mandell, & Sourander, 2009; Skinner & Mcfaull, 2012). Colonialism and the legacy impacts of residential schools have led to many factors that have created an unhealthy environment in which many Indigenous youth grow and live. These factors consist of emotional trauma, lack of parental presence, family disruption, lack of access to social support, loss of identity, lack of access to early childhood development programs, poor housing, and a lack of youth programing (Kral, 2016; Kral et al., 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Richmond, 2009; Tousignant et al., 2013). Programs that address physical and mental health in these communities are critically needed. Youth participation in physical activity has been shown to be an essential component of physical development (Broh, 2002; Darling, 2005; Eccles, Barber, Stone, & Hunt, 2003; Feldman & Matjasko, 2005; Gardner, Roth, & Brooks-Gunn, 2008; Lareau, 2003; Mahoney et al., 2003; Simpkins, Ripke, Huston, & Eccles, 2005; Zaff, Moore, Papillo, & Williams, 2003). Literature suggests that youth who are more physically active than their peers have higher levels of motor control, balance, endurance, bone density, strength, and are less likely to injure themselves. Many of the increases in physical health have the potential to last into adulthood, which can lower the

likelihood of several diseases such as osteoporosis, cardiovascular disease, and diabetes (Chimen et al., 2012; Meyer, & Gullotta, 2012; Smith, 2012).

Physical activity also has been shown to have a positive impact on youth mental health. Youth who participate in physical activity may experience a decrease of psychosomatic complaints and higher levels of self-esteem, physical self-concept, motivation, positive thinking, confidence, and the ability to deal with stressful situations, which can carry on in life and prevent future life problems such as depression, suicidal behavior, drug abuse, and aggressive behavior (Daniels & Leaper, 2006; Kort-Butler & Hagewen, 2011; Larun, Nordheim, Ekeland, Hagen, & Heian, 2006; Oh, Yoshino, Rana, Lee, & Hovatter, 2015; Rachele, Cuddihy, Washington, & McPhail, 2014; Sibold, Edwards, Murray-Close, & Hudziak 2015; Tracy & Erkut, 2002; Trzesniewski, Donnellan, & Robins, 2003; Warner & Dixon, 2013). The benefits of youth physical activity are numerous. However, in many rural communities across Canada, especially Indigenous communities where levels of physical and mental health are lower than those of urban and non-Indigenous Peoples, physical activity levels of youth are much lower than those in urban areas (Horn, Paradis, & Potvin, 2001; Nakano, Fediuk, & Kassi, 2005; Ng, Young, & Corey, 2010; Receveur, Morou, & Gray-Donald, 2008).

There are several factors identified in the literature that contribute to why Indigenous and non-Indigenous do not participate in sports in rural communities. This document will focus on three of these reasons. The first reason is the cost of participation (Forsyth & Heine, 2008). Organized sports such as hockey are expensive, not only for families, but also for communities that must supply an ice

arena in which hockey can take place. The second reason is team sports, such as soccer and basketball are limited due to the number of participants available. As these are all team sports, a minimum number of individuals must participate in order for a community or school to establish a full team. This may be difficult if the graduating class in the high school consists of only 12 people. Due to these small numbers, youth are prevented from participating in competitions with other communities/school or in provincial championships (Roth & Brooks-Gunn, 2003). Many sports are labeled as male or female in society. For example, football is seen as a male dominated sport. Girls and women are often not allowed to play with the boys and men due to fear of injury. Girls can also be perceived as "butch" for participating in male dominated sports and therefore shy away from such sports (Allender, Cowburn, & Foster 2006; Coakley & White, 1992). Studies have shown that many girls are bored with the sports that are offered in their schools (Allender et al., 2006). If sports other than the norm are offered, youth may be more interested in participating (Flintoff & Scraton, 2001). Thus, in many communities school administrations are not providing opportunities for physical activity for a specific gender (Brittain, Jones, & Rikli, 2002; Fasting & Sisjord, 1985; Jacobsen & Sletengen, 2014; Oliver & Hamzeh, 2010; Robbins, Sikorskii, Hamel, Wu, & Wilbur, 2009; Sequeira, Cruz, Pinto, Santos, & Marques, 2011; Sørensen & Gill, 2005). Lastly, the majority of high school sports favour those with specific body types. Having a height over 5'10 has been shown to give participants an advantage in volleyball, basketball, and soccer (Barnsley, Thompson, & Craig, 1988; Krüger, Pilat, Ückert, Frech, & Mooren, 2014; Malina et al., 2004). If youth are taller, they will perform

better in these sports than their shorter peers. Literature has shown that if an individual performs well in a sport the first time that they participate, they are more likely to continue playing the same sport no matter the reason for the better performance (Barnsley et al., 1988; Lippi, Longo, & Maffulli, 2010).

Olympic wrestling is an amateur combative sport that involves different grappling techniques. Its main objective is to throw an opponent and hold them down. Since 708 BC, Olympic wrestling has been a part of the Olympic Games and continues to be a highly competitive sport around the world. The sport of Olympic wrestling increases physical and mental health like other sports, however it is also highly accessible (Oh et al., 2015; Rachele et al., 2014; Sibold et al., 2015; Warner & Dixon, 2013). In terms of affordability Olympic wrestling has little to no cost for participation (there are no fees, schools gymnasiums are offered for free use for school teams, and mats have been offered to schools by Provincial Sport Wrestling bodies). The sport avoids gender barriers by having men and women compete separately, however the two genders still train together. The implementation of weight classes means participants of Olympic wrestling do not require any specific physical characteristic (Channon, 2014; Hayhurst, 2014; Kamble & Wangwad, 2015; Ousley, Shuford, & Roberts, 2013; Pettersson, Pipping, & Berg, 2013; Terry, Hahn, & Simjanovic, 2014). This inclusivity makes Olympic wrestling a positive choice to create a highly accessible extracurricular program for an Indigenous or rural community.

Purpose

The purpose of this pilot study was to determine if an extracurricular Olympic wrestling program implemented in the school in the rural Indigenous community of Miawpukek First Nation (Conne River) NL, Canada would have a positive impact on the physical and mental health of Indigenous youth from ages 12-18 that choose to participate on a regular basis.

Methods

Following Aboriginal and Indigenous methods (Kovach 2009; Smith, 1999; Wilson, 2008) prior to starting the study, Silvey, Buote, Cameron, Donovan, & Dubrowski (2016) conducted an environmental scan to determine if the community of Miawpukek First Nation (Conne River), NL was interested in having an Olympic wrestling program implemented in their community. This gave researchers the opportunity to hear any concerns the Indigenous community may have had about the program. It also allowed researchers to build a relationship with the community in question. This relationship follows in the guidelines set down by Kovach (2009), Smith (1999), and Wilson (2008) in how advocate researchers should conduct themselves when working with Indigenous Communities. After working with Miawpukek First Nation (Conne River), NL Band Council to identify the program design, ethics approval was obtained from the Health Research Ethics Board of Newfoundland & Labrador (reference number: 15 273). The Miawpukek First Nation (Conne River), NL Band Council helped facilitate recruitment whereby participant consent forms were signed by parents for youth to participate. Recruitment was completed via school announcements and word of mouth. Lastly,

the rules of OCAP (Ownership, Control, Access, and Possession) were followed to ensure proper research practices within the Indigenous community (National Indigenous Health Organization, 2007). The rules of OCAP state that

1. The community where the data was collected owns that data.
2. The community has control over the data.
3. The community must have complete access to the data for their own use.
4. Even more important than ownership and access, the community must have a copy of all data. They must be in possession of it in order to access it, and have some control over it.

Program

An Olympic wrestling program was implemented in January 2016 in the community of Miawpukek First Nation (Conne River), NL. A program day consisted of the following practice schedule recommended by the National Coaching Certification Program of Canada (2016):

1. A light warm up consisting of slow running and dynamic stretching exercise such as lunges, twists, skips and throws (Faigenbaum et al., 2007; Verstegen & Williams, 2004).
2. Basic technique of how to wrestle. Beginning with how to stand, defend one's self, accomplish wrestling takedowns, and ground maneuvers (National Coaching Certification Program, 2016).
3. Sparring that consisted of light contact wrestling.

4. High intensity cardiovascular exercises such as circuits or sprints (National Coaching Certification Program, 2016).
5. A light cool down followed by static stretching (Behm, Avery, Faigenbaum, & Panagiota, 2008; National Association of Sport and Physical Education, 2005)

The physical education instructor of St. Anne's School in Miawpukek First Nation (Conne River), NL along with two other parent volunteers were trained using a Train the Trainer method on how to coach the Olympic wrestling. Train the Trainer training took place over four separate visits to the community and was conducted by a Canada Coaching Certified Olympic wrestling coach. The program ran from January until March, two days a week for two hours after the school day was completed for a total of ten weeks.

Attendance for each student who participated was used to determine which youth who attending the testing sessions were part of the intervention group.

Participants

Three adult male (34-47 years) volunteer coaches were trained how to coach Olympic wrestling. No data was collected from the coaches. In an attempt to be inclusive, all youth in the school were invited to partake in the Olympic wrestling program and the testing protocols. A total of 28 youths ages 12-19 years (age of school attendance) completed the entirety of testing, and 9 (eight girls and one boy) of these 28 participated in the Olympic wrestling program regularly (intervention group); defined as having attended the program 10 or more times. The remaining 19

youth chose not to participate in the Olympic wrestling program (attended less than 10 sessions or none at all) but attending the testing sessions and were used as the control group. The control group is much larger (10 participants greater) due to the fact the researchers opened the program to all Indigenous youth at the school between the ages of 12-19 years. This stayed in line with allowing access to any youth that were interested in research and the testing but may not have been interested in the Olympic wrestling program.

Measures

A total of seven tests were conducted with the participants to determine changes in various physiological and psychological dimensions that may have occurred due to participation in the Olympic wrestling program. Due to the remoteness of the target community (a 6.5 hour drive from the nearest university testing facility), laboratory testing was not possible. Instead testing was completed in the local school during school hours. The physical tests and the mental health survey were completed on days 0 (T0) (January, 2016) and 70 (T1) (March, 2016), at which point the program stopped due to a loss of gym allocation and the summer break. A retention test was then completed on day 168 (T3) (September, 2016).

The following tests were chosen due to their ease of use for large groups in a gymnasium (school) setting.

Physical Health Measures:

Body Composition

The Body Mass Index (BMI) is used to calculate an individual's body composition based on their weight and height (Katzmarzyk et al., 2011). The weight of each participant (kilograms) is divided by his or her height squared (centimeters^2) to give a resulting BMI. The use of the BMI is used to identify individuals that are of a risk of having a lower level of health due to higher levels of adipose tissue (Katzmarzyk et al., 2011).

Cardiovascular Fitness

The 20-metre shuttle run test or Beep Test has been shown to be a good indicator of an individual's level of cardiovascular fitness and can be easily done in the school setting (Castro-Piñero, et al., 2010; Matsuzaka et al., 2004; Pitetti, Fernhall, & Figoni, 2002). Participants attempt to run 20 meters before a specific amount of time has elapsed. As the test continues, the time to complete each run becomes shorter and shorter (speed of runner increases from 8km/hr to 18.5km/hr). Once participants have run to exhaustion and can no longer continue a score is given to them (between 1-15) to indicate the level of the test they completed (De Souza et al., 2010; Magutah, 2013; Ruiz, et al., 2008).

Upper Body Muscular Endurance

The number of pushups completed in one minute was used to measure the upper body endurance of the youth. Each youth had one minute to complete as

many pushups as possible and the number was recorded. The youth had the option of doing a standard pushup (on their toes) or modified (on their knees) (Woods, Pate, & Burgess, 1992). The type of pushup they chose was recorded to ensure consistently across all testing sessions. Because the participants have a choice of the type of pushup they are more easily able to participate in the test without being hindered as much from body weight (Woods et al., 1992).

Upper Body Muscular Strength

The handgrip test has been shown to give very similar results to the one repetition max bench press test (within 91%), which is considered to the be the gold standard for testing upper body muscular strength (Faigenbaum et al., 2002; Faigenbaum, Milliken, Moulton, & Westcott, 2005; Fernandez et al., 2016; Milliken, Faigenbaum, Loud, & Westcott, 2008; Woods et al., 1992). Participants simply squeeze a small dynamometer for three seconds and the device records the amount of force produced in kilograms. Each participant held the device with their dominant hand, close to their waist, with their elbow straight. Participants each had two attempts per testing day which were separated by a ten second rest period and the higher of the two scores was recorded.

Lower Body Muscular Endurance

The wall-sit test is widely used to assess endurance in the pelvic and thigh musculature (Wilkerson, Colston, & Marisa, 2012). Participants placed their backs against a wall and had their thighs in front of them at a 90° angle, with their feet also at a 90° angle to their knees. They maintained a static body position against gravity

for as long as possible. The time until they could no longer hold the proper 90° position was recorded.

Flexibility

The sit and reach is the most common flexibility test used and has a high validity as a measure of hamstring flexibility (Castro-Piñero et al., 2010). The test requires a small apparatus, in which participants place their feet on the inside of a box while sitting on their buttocks with their legs extended, and try to reach as far forward as possible without bending their knees. Each participant had two attempts each testing day which was separated by a ten-second rest period and the higher of the two scores was recorded.

Mental Health Measure:

The Kutcher Adolescent Depression Scale (KADS)

The KADS (Brooks, 2004) has been shown to be a useful scale in the school setting, as it is time efficient, sensitive to change over time for each individual participant, and valid. The survey is designed to measure the changes in the levels of depression among youth ages 12-17 years. For each question, a statement is given and participants have a choice to answer with "hardly ever," "much of the time," most of the time," or "all of the time." Each statement relates to the mental health of youth as it pertains to suicide and depression. The questions are then scored with a higher score relating to a lower level of mental health (Brooks, 2004). The community of Miawpukek First Nation (Conne River) asked the KADS scale to be

changed slightly, and the answer choices of "never" and "I don't know" were added to the scale. Also, any youth who indicated suicidal ideation were flagged and seen by the school guidance consoler.

The mental health survey was completed prior to any physical testing. The order of the remaining tests were randomized to prevent any selection bias and then completed in the same order each session to ensure consistency between testing dates. Weight and height were taken for each participant. A warm up of three laps around the gymnasium at a light jog was then completed before the remaining tests began. The order of testing was as follows: 20m shuttle run, number of pushups in one minute, wall-sit, sit and reach, and the handgrip test. Mean scores for each of the tests was calculated for each data collection sessions, and for both the intervention and control groups.

Analysis

Two-way repeated measures ANOVA were performed to assess the change over the course of the program on the physical and mental assessments (2 groups (intervention and control x 3 times (pre, post, and retention). Those who attended regularly were compared to those who rarely or did not attend. Those who dropped out over the course of the program were removed from the analysis (total that completed all testing was 28 participants). Lastly, a retrospective power analysis was conducted with tests that showed positive increases in the intervention group.

Results

Figures 2 through 8 show the results of the physical and mental health testing. Significant changes were not found for any of the testing, however, the Beep Test (Figure 3), wall sit (Figure 6), and sit and reach (Figure 7) trended towards a positive change. There were however, only 9 intervention and 19 control subjects and the retrospective power analysis showed that a total of 42, 52, and 52 respectively, would allow for a detection of a significant change ($p<0.05$) for the intervention group (participants) when compared the control group. Tables of each of the tests along with their means and standard deviations can be found in Appendix 1.

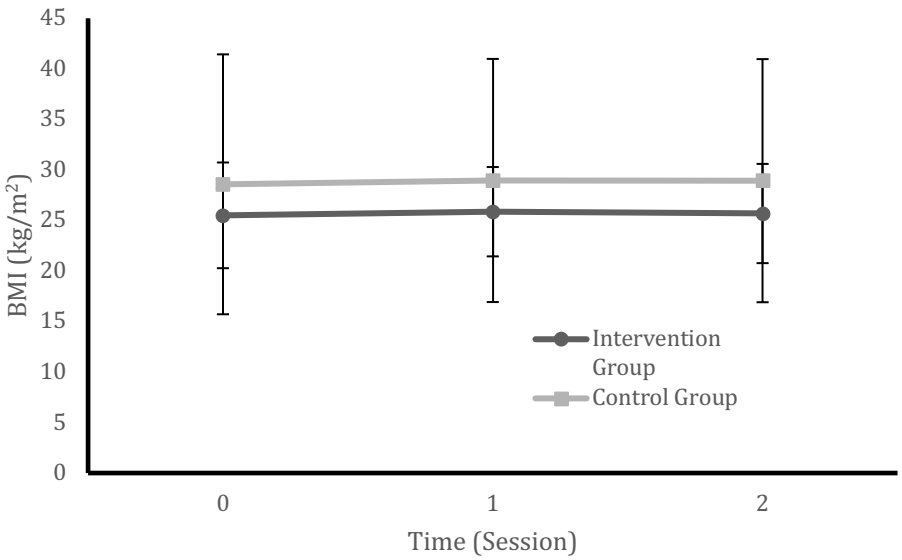

Figure 3. Baseline, completion of intervention, and retention BMI scores for intervention and control groups.

The analysis for BMI showed no significant interaction between group and time of testing (p=.988). In addition, there was no significant main effect for group (p=.549) meaning that all participants entered and exited the program with similar BMI. Finally, there was no main effect for time of testing (p=.474), meaning that the

participants BMI did not change over the duration of the program. Means and standard deviations for all conditions are presented in Figure 2.

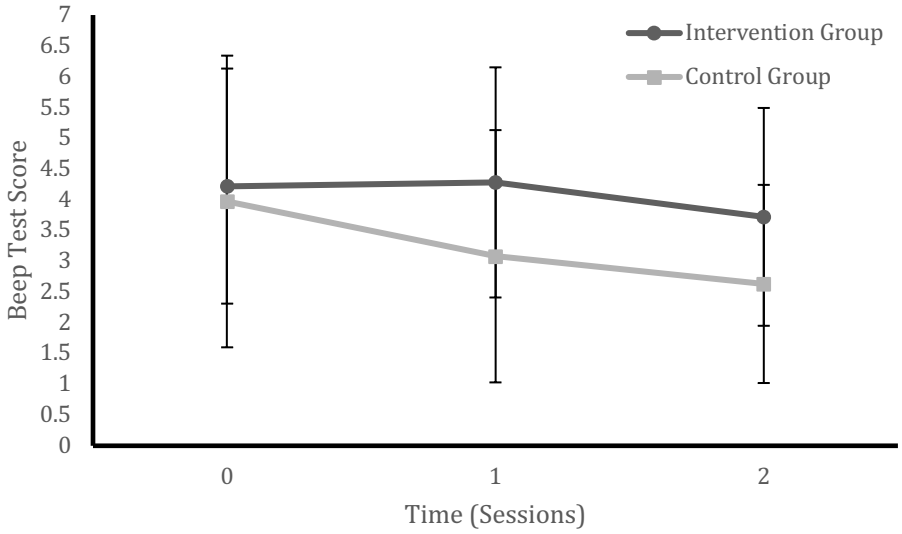

Figure 4. Baseline, completion of intervention, and retention Beep Test scores for both intervention and control groups.

The analysis for Beep Test showed no significant interaction between group and time of testing (p=.109). In addition, there was no significant main effect for group (p=.012) meaning that all participants entered and exited the program with similar Beep Test. Finally, there was no main effect for time of testing (p=.258), meaning that the participants Beep Test score did not change over the duration of the program. Means and standard deviations for all conditions are presented in Figure 3. The retrospective power analysis indicated that a total of 42 participants (21 per group) would be required to detect significance for this measure.

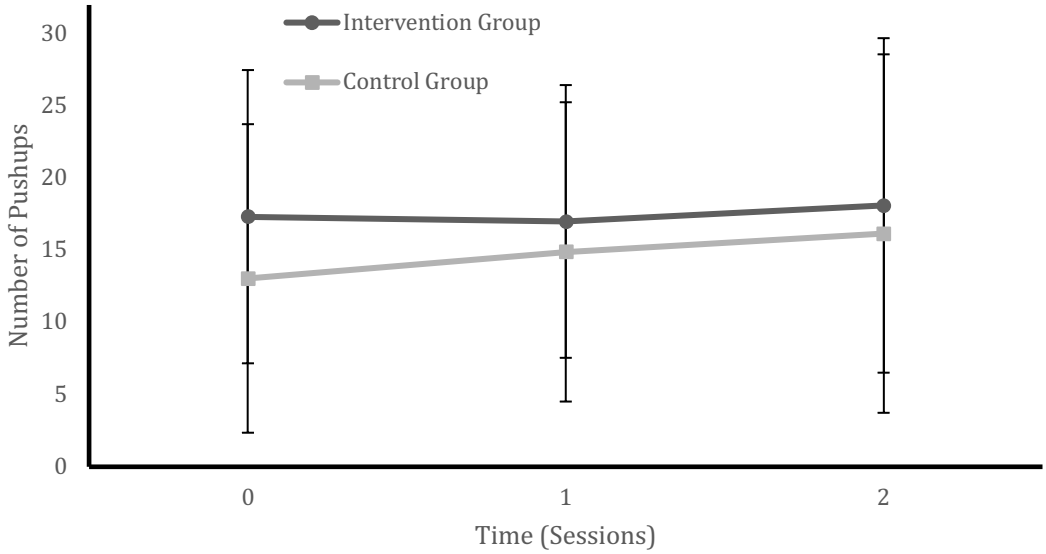

Figure 5. Baseline, completion of intervention, and retention number of pushups in one-minute scores for both the intervention and control groups.

The analysis for the number of pushups showed no significant interaction between group and time of testing (p=.780). In addition, there was no significant main effect for group (p=.513) meaning that all participants entered and exited the program with similar number of pushups. Finally, there was no main effect for time of testing (p=.491), meaning that the participants number of pushups did not change over the duration of the program. Means and standard deviations for all conditions are presented in Figure 4.

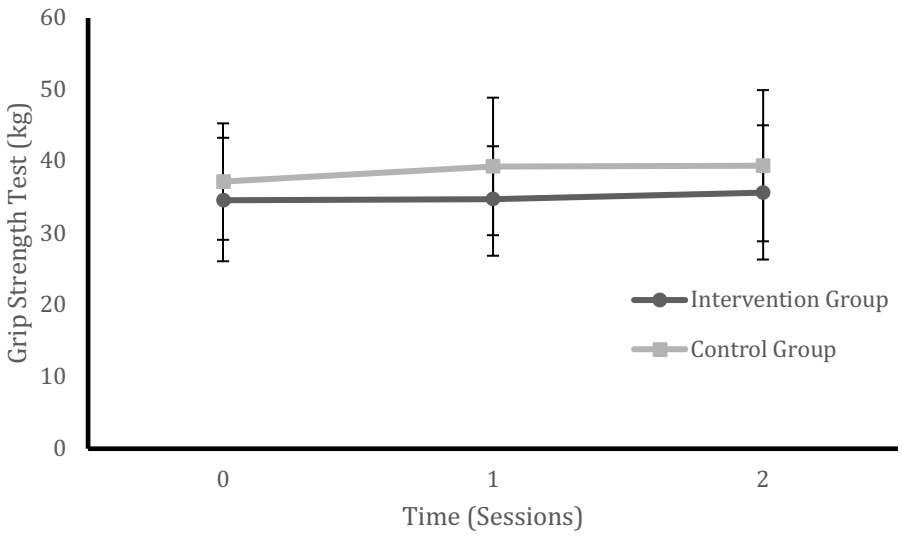

Figure 6. Baseline, completion of intervention, and retention grip strength test scores for both the intervention and control groups.

The analysis for the grip strength test showed no significant interaction between group and time of testing (p=.605). In addition, there was no significant main effect for group (p=.385) meaning that all participants entered and exited the program with similar grip strength test scores. Finally, there was no main effect for time of testing (p=.300), meaning that the participants grip strength test score did not change over the duration of the program. Means and standard deviations for all conditions are presented in Figure 5.

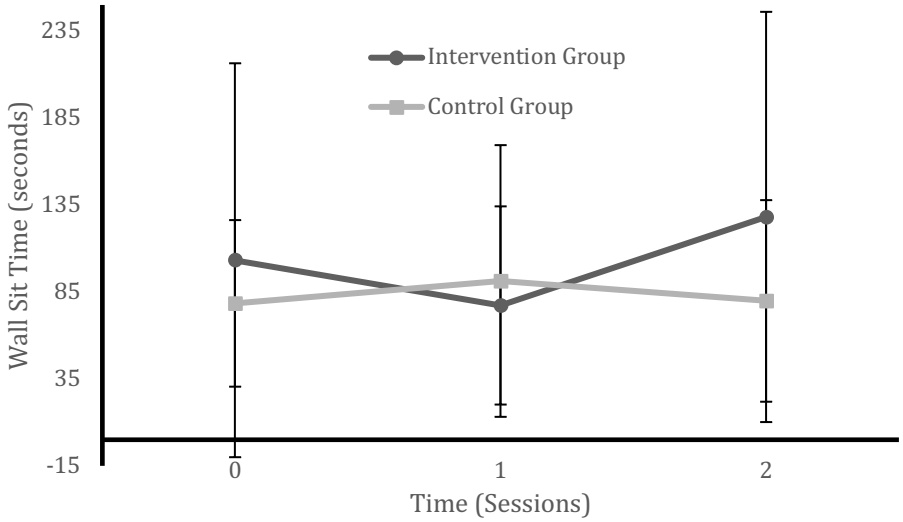

Figure 7. Baseline, completion of intervention, and retention wall sit scores for both intervention and control groups.

The analysis for the wall sit test showed no significant interaction between group and time of testing (p=.166). In addition, there was no significant main effect for group (p=.353) meaning that all participants entered and exited the program with similar wall sit test scores. Finally, there was no main effect for time of testing (p=.480), meaning that the participants wall sit test score did not change over the duration of the program. Means and standard deviations for all conditions are presented in Figure 6. The retrospective power analysis indicated that a total of 52 participants (26 per group) would be required to detect significance for this measure.

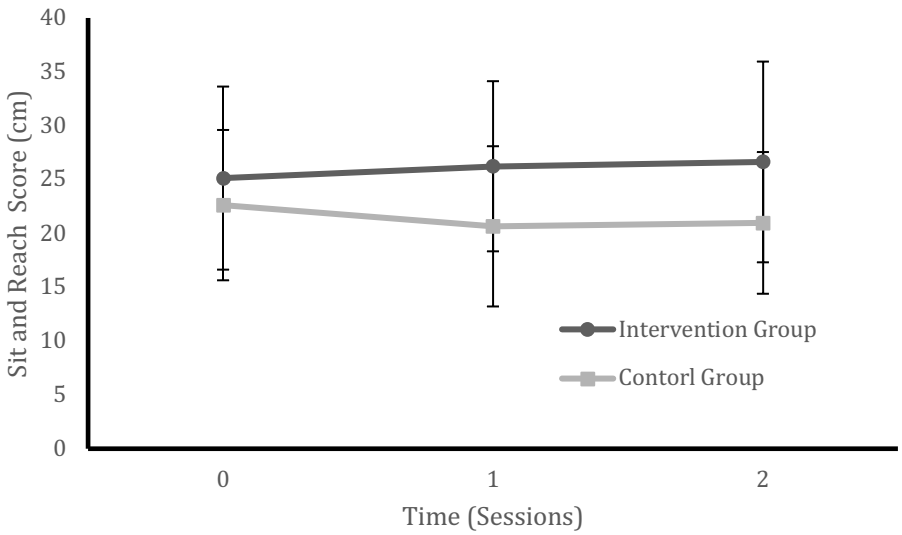

Figure 8. Baseline, completion of intervention, and retention sit and reach test scores for both the intervention and control groups.

The analysis for the sit and reach test showed no significant interaction between group and time of testing (p=.175). In addition, there was no significant main effect for group (p=.828) meaning that all participants entered and exited the program with similar sit and reach test scores. Finally, there was no main effect for time of testing (p=.151), meaning that the participants sit and reach test score did not change over the duration of the program. Means and standard deviations for all conditions are presented in Figure 7. The retrospective power analysis indicated that a total of 52 participants (26 per group) would be required to detect significance for this measure.

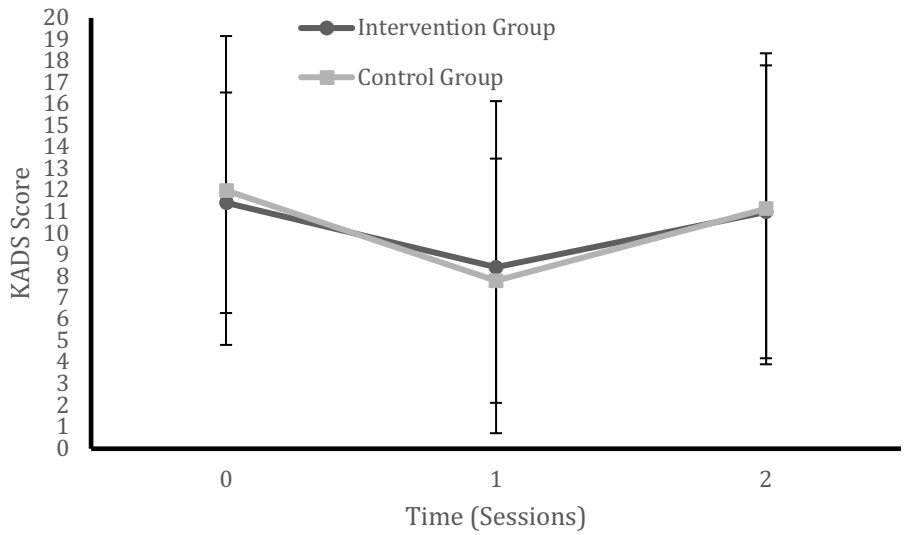

Figure 9. Baseline, completion of intervention, and retention KADS scores for both the intervention and control groups.

The analysis for the KADS showed no significant interaction between group and time of testing (p=.819). In addition, there was no significant main effect for group (p=.006) meaning that all participants entered and exited the program with similar KADS scores. Finally, there was no main effect for time of testing (p=.992), meaning that the participants KADS score did not change over the duration of the program. Means and standard deviations for all conditions are presented in Figure 8.

Discussion

The findings of this thesis suggests that an Olympic wrestling program may have a positive impact on the physical health of Indigenous youth, but considering the sample size was too small to detect significant findings, more research is warranted. An Olympic wrestling program did not have a significant impact on participating youth's' mental health. Finally, a high a level of youth that were eligible to attend participated.

Although there were not significant changes in the physical health of participating youth, there were interesting changes in some of the testing results. Lower body endurance (wall sit) increases appeared at the retention test, most likely because of multisport participation. Specifically, several of the youth that participated in the Olympic wrestling program also participated in other sport and activity programs within their community. Most of these programs occur in the evenings (including Olympic wrestling) and several participants during the post-testing discussed being "tired" from participating in the previous night's activities. The Olympic wrestling program had also just concluded its final practice the previous evening and many participants may have been fatigued from their final training session. Borresen and Lambert (2009) along with Rampinini, Impellizzeri, Castagna, Coutts, and Wisløff (2009) found that fatigue caused by prior training has been shown to inhibit physical performance. This may have caused the drop in participants' performance for lower body muscular endurance testing after the intervention. The lower body muscular endurance retention test was completed during the month of September, before any sport activities had begun in the school. This may have allowed athletes to be functioning at higher energy levels, which could have led to better a better endurance type performance.

The Beep Test and sit and reach test also had small changes in testing at the end of the program. Olympic wrestling practices place a large amount of stress on the cardiovascular systems of participants and practices can last up to two hours with a high level of intensity throughout, this can lead to increases in cardiovascular fitness over time (Williams, Williams, & Wilkins, 1999). Mitchell, Haskell, Snell, and

Van Camp, (2005) showed that the cardiovascular fitness of Olympic wrestlers is higher than those of sedentary individuals and other sports such as gymnastics, climbing, football, rugby, volleyball, and baseball. Although flexibility has been shown to not be a major contributor to a high level of success in Olympic wrestling performance, Ratamess et al. (2013) and García-Pallarés, López-Gullón, Muriel, Díaz, and Izquierdo, (2011) have demonstrated that muscle stretching is a major component of Olympic wrestling practices. A greater increase in flexibility occurred in the intervention group, as most of the group were likely not stretching prior to participating in the program, and stretching twice a week at practices led to these increases (Bandy, Irion, & Briggler, 1997; Gajdosik, 1991).

The retrospective power analysis suggests that more participants are needed to reach significance for the above measures. This is a pilot project and therefore the researchers did not anticipate finding significance at this point. However, the researchers aimed to work with Miawpukek First Nation (Conne River), NL and the participants to get an estimate of the effect size and therefore identify the number of participants that are needed for a program that would include multiple small communities spread throughout Newfoundland and Labrador.

Contrary to the hypothesis of this pilot study the Olympic wrestling program did not have a positive impact on the mental health of the participating youth. The improvements of both the control and intervention groups may have been caused by an increase in daylight hours and the ability for the youth to spend longer amounts of time outdoors. The program ran from the end of January until the middle of April and as the program progressed the days became longer and the temperatures

increased significantly. The seasonal changes (from winter to spring) may have led to an increase in the mental health of the youth. Carson and Spence (2010) and Goodman, Page, and Cooper, (2012) have shown that an increase in exposure to daylight and an increase in temperature can decrease both depression and anxiety, and also lead to an increase in youth physical activity. The retention testing took place at the beginning of the school year in September as the days were getting shorter and the school year had just begun. Suldo, Shaunessy, and Hardesty, (2008) has indicated that the stresses of returning to school after summer holidays may have a negative impact on mental health and this may have caused the decrease of both the intervention and control groups.

Finally, several youths in the intervention group showed low levels of mental health during baseline testing and did not attend future data collection sessions or continue with the program. As studies such as Dishman et al. (2006) and Goodman and Whitaker (2002) have shown, youth who are depressed or suffer from lower levels of self-efficacy are less likely to participate in sport and other activities and this may indicate that the program could have had a greater impact if it was opened to a younger age group. Often, younger Indigenous youth have higher levels of mental health than that of their older peers, and thus if they can be reached earlier they may be more inclined to participate in sport programs. This could in turn lead to higher levels of mental health and help prevent the onset of depression for these Indigenous youth in their later teenaged years (Oh et al., 2015; Rachele, Cuddihy, Washington, & McPhail, 2014; Sibold, Edwards, Murray-Close, & Hudziak, 2015; Warner & Dixon, 2013).

This pilot project worked with an Indigenous community exploring a physical activity that had not been explored in this manner before and was successful in its implementation. A total of 33% of Indigenous youth eligible to participate in the program chose to attend. By building capacity in the community the program continues to operate with the physical education instructor of the local school operating the program and is now a fully Canadian Coaching certified wrestling coach. Several of the youth from the program went on to compete in the North American Indigenous Games, along with one participant competing in the Canada Games. Bowker (2006) has shown that participation in such major sporting events has shown to improve areas of mental health such as self-confidence (North American Indigenous Games Council, 2014). The project also led to an increase in opportunities for Indigenous youth that could also contribute to improving their mental and physical health.

Future Program Improvements/Limitations

In future, implementation of sport programs in Indigenous communities need to consider the interaction of other programs being offered in the community and the time of year the program is being offered. The interaction of other programs may have been detrimental to the testing when participants were fatigued. The weather and season may have been a cause of lower levels of mental health at the beginning of testing, as the days were shorter and colder preventing youth from being active for longer periods of time, which might have improved their mood and interest in participation. These and other contextual factors should be explored to

maximize the effectiveness of sport programs in small, rural indigenous communities

Conclusion

The Olympic wrestling pilot program was successfully implemented in the community of Miawpukek First Nation (Conne River), Newfoundland, Canada, and continues to function with little aid from researchers. Thus the program has shown to be sustainable and results trended towards positive, though statistically non-significant changes in some Indigenous' physical characteristics. Indigenous youth who participated had changes in cardiovascular fitness, lower body muscular endurance, and flexibility when compared to those that chose not to participate, which trended in a positive direction. Although not statistically significant these results suggest that offering Indigenous youth sport activity choices, may increase participation and help these youth increase their physical health. However, more research is needed, focused on work with more communities and increasing the age range for eligibility to increase the number of participants and possibly broaden the impact. With the completion of this pilot program this project should now consider research on similar programs run for a more extended periods of time in more remote Indigenous communities.

Interlude

It was my thought it might be time for a bit of an intermission from all the academic speech. Instead, I would like to bring you back to the story about my life and how I ended up exceling in education past the level that one professor thought I would be able.

The idea of individuals not going past the same level of education as their parents, obviously did not sit well with me. I started to ask people about the issue. Most students at the university told me their parents were doctors, lawyers, physiotherapists, had Master's degrees, some PhDs, and almost all had at least one parent with an undergraduate degree. After about a week, I started to think that the professor was right and I was just an anomaly.

One day, I was having lunch with a group of friends. Some were peers and others I had taught when I was teaching for the Human Kinetics Department at Memorial University of Newfoundland. I mentioned the level of education theory to them and almost all of them started to laugh. One woman I had taught (and now mentor) said that her mother was an immigrant from West Africa who had not even finished high school, and still could not speak English. Another friend mentioned that his parents had seldom left the Indigenous community that he came from and barely finished high school. And then another, and another all told similar stories. All of us had parents who had not furthered their education past high school. Yet every one of us was completing a Master's degree or a PhD.

I sat there eating my lunch, thinking quietly about all this new information and for a while, I could not figure out what it was that made us so different from everyone else I had spoken to on campus. Then it hit me, all of us had competed as elite level athletes. One person at the table now plays professional basketball in Europe; another played high-level soccer, another, a varsity volleyball player, another competed in varsity x-country, and lastly, I was an elite level martial artist. The one thing we all had in common was that we engaged in high-level competition in sports. In my opinion sports had helped us gain self-determination, had taught us self-regulation, and gave us the confidence needed to achieve what some would believe to be unachievable. I started to conduct some more research on sports and the ideas of self-regulation. My theories were supported. This small side project helped me to build confidence that this thesis would have an impact on the lives of the youth I would be working with. At this point I was confident I knew that these sports were the reason we had all done so well in our educational pursuits, but as I believe this thesis will show, this was only part of the answer.

Chapter 6: Manuscript 4

The impacts of an Olympic Wrestling program on the academic achievements, physical health and overall health of a 13-year-old Indigenous youth: a case study

Published in the Physical Health and Education Journal (2018)

Abstract

Youth living in Indigenous communities across Canada have shown to have lower levels of physical health and health than their non-Indigenous peers. An expanding body of research suggests that physical activity can have a positive impact on physical health and overall health. This case study was designed as a view into the change evident in one young woman (age 13) during her journey through an Olympic wrestling program implemented in her Indigenous community. Several tests were conducted with the participant, along with an interview with the participant & the participant's guardian and a review of her school physical education grades. The interview focused primarily on how participation has impacted the youth's life. Results suggest that increases in physical activity through participation in the Olympic wrestling program has lead to improvements in physical education grades, physical and, as it appears, overall health. Findings may be helpful to Indigenous communities who wish to start their own programs and to other professionals interested in working in these sport environments.

Background

Youth who live in Indigenous communities in Newfoundland and Labrador (NL) have been shown to have lower levels of physical health and health than youth who live in non-Indigenous communities (Lehti, Niemelä, Hoven, Mandell, & Sourander, 2009; Skinner, & Mcfaull, 2012). Several factors have been shown to contribute to these lower levels of health, such as, emotional trauma, lack of parental figure, family disruption, lack of access to social support, and loss of identity (Kral, 2016; Kral, Idlout, Minore, Dyck, & Kirmayer, 2011; Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Richmond, 2009; Tousignant, 2013). Literature suggests that participating in extracurricular activities can increase youth self-esteem and as it pertains to sports, can lead to higher levels of physical and mental health (Daniels & Leaper, 2006; Erkut & Tracy, 2002; Tracy & Erkut, 2002). These increases can also lead to a higher degree of success in school (Castelli, Hillman, Buck, & Erwin, 2007).

Many youth-oriented extracurricular programs are not accessible to all due to social economic, gender, genetic, and physical fitness barriers (Allender, Cowburn, & Foster, 2006; Coakley & White, 1992; Orme, 1991; Roth & Brooks-Gunn, 2003; Silvey et al., Submitted; Silvey, Buote, Cameron, Donovan, & Dubrowski, 2017). The sport of Olympic wrestling has been shown to have fewer barriers to participation than most sports, and thus has been considered a positive choice as an extracurricular activity in the Indigenous community to nurture health (Hanson, Nabavi, & Yuen, 2001; Oh, Yoshino, Rana, Lee, & Hovatter, 2015; Rachele, Cuddihy, Washington, & McPhail, 2014; Sibold, Edwards, Murray-Close, & Hudziak 2015;

Warner & Dixon, 2013). With these aims in mind, an Olympic wrestling program was implemented in a rural Indigenous community in Newfoundland & Labrador, Canada. The purpose of the program was to increase sport participation in the community, with the aim of improving physical and mental health (Silvey et al., Submitted; Silvey et al., 2017). Silvey et al. (Submitted) conducted an in-depth study to determine the impacts of the Olympic wrestling program.

An individual case study can often shed light on what results are possible from a program and indicate what could be lost in the statistics of a cohort study (Flyvbjerg, 2006). By examining a case study on an individual, researchers are able to suggest what the possibilities may be from a single intervention. Although an individual case study may not be generalizable to the public, it can be a strong study design for addressing questions that require description and aid in developing understanding (Green & Thorogood, 2014).

The purpose of this case study is to examine one specific youth who participated in the Olympic wrestling program introduced in the Indigenous community, by Silvey et al. (Submitted) to show what impacts may be possible to achieve from the program.

Methods

Prior to starting the study, ethics approval was obtained from the Health Research Ethics Board, of Newfoundland & Labrador (reference number: 15 273). The Band Council of the Indigenous community in question granted permission, and participant/parent consent was collected.

The youth participant in question was a 13-year-old female student in grade eight when the study was conducted. She participated in the Olympic wrestling program implemented in her community, as described in Silvey et al. (Submitted), on a regular basis (twice per week) for the duration of the program (10 weeks). Pre- and post-tests of physical and mental health were used to determine the effectiveness of the program. This youth appeared to benefit more than other participants who participated in the program and therefore, an interest was generated to further investigate some of the contextual factors (i.e. personal, family, other activities) that contributed to her success.

In order to examine the physical impacts of the program the following tests were completed by participants of the program and a control group (individuals who attended the same school, but did not participate in the program): Body Mass Index, Beep Test (cardiovascular fitness), number of push-ups in one minute – participants had the option of completing the pushups on their knees or toes (upper body muscular endurance), and grip strength (upper body strength) (Silvey et al., Submitted). The Kutcher Adolescents Scale (KADS) (Brooks, 2004) was used to assess the level of mental health of the participants of the program and a control group (Silvey et al., Submitted). The KADS has been shown to be a useful scale in the school setting, as it is time efficient, sensitive to change over time for each individual participant, and valid. Specific to this case study, the physical education grades of the case study participant were received with permission from both the Indigenous community school board and parents to compare changes. The physical education grade was chosen because it had the most notable change. Other grades (science,

mathematics, English, etc.) improved, but not substantially. Grades from other participants and the control group were not made available to the researchers. Lastly, a short open-ended discussion was conducted between the guardian (mother) of the case study participant, the participant, and the researchers. This discussion took place in the youth's home and allowed the participant and her mother, to speak freely about the impact of the program.

The changes between pre and post grades and physical and mental health tests were then compared and the changes noted for both the case study participant, the remaining participants in the program, and the control group.

Results

Tables 7 through 12 show the results of the physical and mental health testing for all three groups. Each table also includes the changes between pre and post testing.

Table 7. Results for the BMI pre and post with changes for each group.

Group	Pre-Test kg/m^2	Post-Test kg/m^2	Change kg/m^2
Case Study	31.6	28.0	-3.6
Remaining Intervention Group (mean)	27.34	25.54	-1.8
Control (mean)	25.65	27.11	+1.46

For BMI the results show a positive change (lower BMI) for the case study participant, which seems to suggest that results doubled from that of the Intervention group and over three times greater than the control group.

Table 8. Results for the Beep Test pre and post with changes for each group.

Group	Pre-Test	Post-Test	Change
Case Study	3	5	+2
Remaining Intervention	4.45	4.27	-0.18

Group (mean)			
Control (mean)	4.35	3.96	-0.39

For Beep Test the results show a positive change (higher score) only for the case study participant while both the intervention group and the control group decreased.

Table 9. Results for the number of pushups in one-minute pre and post with changes for each group.

Group	Pre-Test (#)	Post-Test (#)	Change (#)
Case Study	25	30	+5
Remaining Intervention Group (mean)	14.64	13.91	-0.73
Control (mean)	14.65	14.925	+0.28

For number of pushups in one minute the results show a positive change (higher score) for the case study participant and a decrease for the Intervention group. The control did increase slightly but was 17 times less than that of the case study participant

Table 10. Results for the grip strength pre and post with changes for each group.

Group	Pre-Test (kg)	Post-Test (kg)	Change (kg)
Case Study	29	31	+2
Remaining Intervention Group (mean)	38.32	38.18	+0.14
Control (mean)	38.61	40.53	+1.91

For grip strength the results show a positive change (higher score) for the case study participant, intervention and control groups. The case study participant was similar to the control group while the intervention group showed little change.

Table 11. Results for the KADS pre and post with changes for each group.

Group	Pre-Test (score)	Post-Test (score)	Change (score)
Case Study	12.57	1	-11.57
Remaining Intervention Group (mean)	11.01	9.35	-1.66

Control (mean)	11.71	8.22	-3.49

For the KADS test all the results show that all three groups improved (lower score) however, the case study participant's score decreased by more than three times that of the control.

Table 6 shows the grades and changes for the case study participant. The case study participant took part in the program during Term 2 and Term 1 is used as a control.

Table 12. Term grades for this case study participant over the school year.

Course	Physical Education
Term 1 Grades	81%
Term 2 Grades (Intervention)	95%
Change	14%

The case study participant's physical education grade showed a large increase after the intervention of the Olympic wrestling program.

The discussion with the participant's guardian suggested that the parent fully supported the youth's participation in the program and that the guardian was witnessing positive changes in the participant's behavior. The guardian was heavily invested in the program from the beginning. She sent numerous emails to the school where the program took place and also to implementers about the program with different ideas she had to make the program more successful, and she purchased equipment for her daughter to train in the home. Still involved in the program, the guardian is currently working with the Band Council to make the program more sustainable in the community. The excerpt below shows that the discussion with

the guardian demonstrates the passion the guardian had for her daughter's interest in the program:

> "As a parent I just want to thank you for bringing in the new [Olympic Wrestling] program. Although I understand this is only a part of a research project, as one mom I am truly thankful to you for giving my daughter an opportunity to explore something new that otherwise she would not.
>
> After each and every practice she comes home happy and excited about what she has done today and what she has learned and talks of continuing this somehow. She even practices every day and is excited for the next practice after school. It would be nice to see this type of program continue. "

The discussion with the participant showed a high level of enthusiasm for the program. The participant used the interview time to show researchers around her house, spending an extended period of time demonstrating how she used the equipment purchased by her mother for her to train at home. She also discussed her mother's support, training with her several times a week in the basement of their home. The mother would often call out different techniques and help her daughter as best she could complete the movements. The participant asked questions about future competitions and the program continuing once the 10-week trial is completed. She also mentioned to researchers that she was disappointed that her friends in school did not participate in the program, but admitted she did not participate in any other physical activity programs herself. She instead mentioned

that instead of coming to the program they were "out drinking and doing other stuff." Lastly, the case study participant discussed how many youth in her community were "followers…and if everyone isn't doing it, then no one wants to do it."

Once the ten-week Olympic wrestling program ended, there was very little wrestling training before the summer months. During the summer months, the case study participant did not remain active and found other interests. When she returned to school in the fall she decided not to participate in the program on a regular basis (less than once per week). However, her mother is now one of the most active members in the community promoting the program. She has incorporated the Olympic wrestling program into a youth activity program that she operates in the community to help improve the physical and mental health of youth though community cohesion creation programs. The case participant's mother is now one of the leaders of the Olympic wrestling program and is training to become a wrestling coach.

Discussion

This case study demonstrates the potential impact that an Olympic wrestling program implemented in a rural Canadian Indigenous community can have on participants' physical education grade, physical health, and mental health. It also demonstrates that parental involvement and support might be a key component to the success of participants in the program.

Getting youth active in order to increase physical and mental health has been a widely discussed topic in the past several years. Erwin, Michael, Centeio, and

Morrow, (2014) and Geuevremont, Kohen, and Findlay (2010) both show the importance of increasing youth physical and mental health through extracurricular programs. They both suggest that this is currently extremely important due to the limited amount of physical education offered in schools across Canada and the United States (average one to two hours per week). This study supports these claims, as shown in this paper, as the youth participated in the extracurricular Olympic wrestling program, her physical and mental health improved substantially in almost all areas. Specifically, the youth's mental health appears to have improved. This improvement as shown by the KADS scale, represents a decrease in anxiety, suicidal thoughts, and depression and reinforces the claim that extracurricular sporting activities can lead to increases in mental health for participants.

A major change is also seen in the youth's physical education grade. Most physical activity programs are graded on motivation and participation (Zhu, 2015). The results of such assessment suggest that as the youth became more interested in the Olympic wrestling program she also became more interested in participating in her regular physical education classes. This increase in interest may have lead to a higher level of participation and is reflected in her term two grade for physical education.

Consistent with previous research, the current case study shows the important role that parents have in supporting their youth to engage in physical activity extracurricular activities (Adkins, Sherwood, Story, & Davis, 2004; Prochaska, Rodgers, & Sallis, 2002; Sallis, Prochaska, & Taylor, 2000). The case study participant's mother was involved in the program from the onset. The mother

of the participant constantly asked the implementers questions, attended meetings to support the program, and motivated her daughter to train by purchasing her equipment and training with her at home. Alderman, Deal, and Olson (2011) and Trost et al. (2003) both show a strong correlation between parental support and levels of youth physical activity. This parental support may also have lead to the participant's positive attitude and enthusiasm towards the program. Therefore, an increase in parental support can lead to greater improvements in school performance, physical health, and mental health with a higher degree of participation in physical activity programs. The support of the mother of the case participant has also helped the program become sustainable. This supports Wilson, Lawman, Segal, and Chappell (2011) findings that parental and neighborhood involvement leads to higher levels of youth physical activity and can lead to more sustainable programs. Although the case participant decided to stop participating in the program on a regular basis, her mother's involvement in the program has lead to an increase in the number of youth participating (from 11 during intervention to 20 currently).

When speaking with the case study participant, researchers noticed a high level of enthusiasm for the program. However the youth also voiced concerns of not having friends participate in the program. Pate, Long, and Heath (1994), Prochaska, et al., (2002), and Smith (1999) all show that peer influence/pressure is one of the main factors contributing to participating or not participating in physical activity programs. The strong influence of peers can either make youth decide to participate or if peers later dropout of a physical activity program, they are likely to influence

their close peers to dropout as well. This is supported by the youth's statement that many of her peers would not participate in the program, because "everyone else isn't doing it". Although the youth did reveal concerns of her peers not participating, she choose to participate for the entirety of the program and this may have been due to her guardian's strong support during the program. The participant's mother highlighted in the case study was involved in the program from the onset. The parental role may have been a substitute for the lack of peer support for the youth in the program and lead to the participant's positive attitude and enthusiasm towards the program. To reiterate, an increase in parental support could lead to a higher degree of participation in physical activity programs in spite of lack of peer support, which in turn may lead to greater improvements in school performance, physical health, and mental health.

Limitations

As this is a case study, the information is limited to just that of the individual participant and cannot be generalized. Since the program was run for only 10 weeks, future studies should attempt to examine more long-term offerings to determine the impacts. Interviews with other friends and family could have provided more detail on the supportive factors influencing this girl's participation. Further follow-up would have helped to explain the case's decision not to consider participating when she returned to school after the summer break. This case study also suggests there would be value in exploring contextual factors with other participants who did not demonstrate the same improvements as this case.

Conclusion

This case study shows what an extracurricular Olympic wrestling program can achieve in relation to physical education, physical health, and possibly mental health as it pertains to participants with positive parental support. The improvements seen in the youth's physical and mental health may be higher than average, but are something for implementers of future programs to strive towards. This case study reinforces the importance of offering youth several different choices of extracurricular activities that can lead to healthy, more engaged participation. It also supports the notion of the importance of gaining parental involvement in youth activity programs.

Chapter 7: Manuscript 5

Photovoice: A tool within Indigenous research to examine the impacts of Olympic wrestling on Indigenous Youth

Abstract

Background: Indigenous youth sport is an important component to improving the physical and mental health of Indigenous youth. Collecting information about the impacts of sports programs can often be one sided (from the view of the researcher), thus finding tools that allow researchers and Indigenous communities to work together is important.

Objective: The objective of this case study was to empower youth to tell their own story about how participating in an Olympic wrestling program and the 2017 North American Indigenous Games (NAIG 2017) impacted their lives.

Methods: Two Indigenous youth, one female and one transgender of the ages of 15 and 18 years participated in the study. Both youth attended an Olympic wrestling program in their community and also represented their Canadian province at NAIG 2017. Working with a photovoice method, each youth was asked to create a photographic essay, using 15-20 photographs that captured the impacts the program and games had on their lives and then discuss the essay. Next, individual interviews were conducted to discuss the photographs. Two researchers reviewed the field notes from the interviews independently. Using thematic analysis, they grouped the photographs and interview content into themes.

Results: Four themes emerged based on the photographs and discussions between the youth and researchers: Self-Confidence/Self-Perception, Healthy Choices, Community Cohesion, and Cultural Exploration.

Conclusion: The findings suggest that photovoice could be a useful method when working with Indigenous communities to promote involvement. It enables communities to articulate their perspectives. The findings also suggest that sport and sport competitions, specifically Olympic wrestling and NAIG 2017 can have a positive impact on the overall wellbeing of the participating youth.

Introduction

Interventions to improve youth physical and mental health are needed in rural and Indigenous communities across Canada (Kral, 2016; Laiberté & Tousignant, 2009; Tousignant, 2013). These areas have some of the highest rates of youth obesity, depression, and suicide (Kral, 2016; Kral et al., 2011; Laiberté & Tousignant, 2009; Mcgavock, 2015). Sport programs have been shown to improve both the physical and mental health of youth by supporting healthy diets, creating community cohesion, increasing self-esteem, and increasing levels of activity (Silvey et al., 2018; Silvey, Buote, Janes, Donovan, & Dubrowski, 2018; Warner & Dixon, 2013). Many Indigenous communities in Canada offer sports programs; however, the majority of these programs – along with many in non-Indigenous communities – have barriers that prevent some youth from participating. Some of these barriers found in Indigenous and non-Indigenous communities are socioeconomic (costs), gender (male vs. female sports), physical (height/size advantages), and levels of fitness prior to joining a sport program (Blodgett et al., 2010; Brittain, Jones, & Rikli, 2002; Sørensen & Gill, 2008). The barriers can often prevent youth participation in sport and can lead to detrimental impacts on mental and physical health (Blodgett et al., 2010; Sørensen, & Gill, 2008).

Olympic wrestling has been shown to have fewer barriers limiting participation than what is often found in many other sports. Olympic wrestling is an inexpensive sport for participants: little equipment is required and, both boys and girls compete and train together. In addition to these factors, due to weight classes, physical advantages are minimized; and in spite of the fact that the sport features

individualized competition wrestlers train together in a team sport environment. It allows everyone on the team to participate at his or her own pace and creates an accessible environment for competition and training no matter the level of participant physical fitness (Kamble & Wangwad, 2015; Silvey, Benton, & Tatigian, 2016). This minimization of barriers experienced by many youths wanting to participate in sport makes Olympic wrestling ideal for a physical activity program aimed at such youth.

In 2016 and 2017, Silvey et al. (Submitted) worked with an Indigenous community located on the island of Newfoundland, to develop, implement, and evaluate a ten-week Olympic wrestling program for youth ages 12-18 years. The program evaluation showed improvements in the physical and mental health of some of the participating Indigenous youth. The program has been sustained as the community continues to run the program with little aid from researchers. Some of the participating youth have competed in the 2017 NAIG, 2017 Canada Games, and the 2018 Newfoundland and Labrador Winter Games.

As a qualitative research method, photovoice is often used in health research with marginalized populations and youth to give participants a way to express their thoughts and feelings on a specific subject (Beh, Bruyere, & Lolosoli, 2013; Holtby, Klein, Cook, & Travers, 2015; Killion & Wang 2000; Strack, Magill, & McDonough, 2004; Wilson et al., 2007). Typically, the participants are asked to capture images regarding a specific subject/theme in their own home environments. The images are then examined by researchers and discussed with the participants to create a visual story about the subject/theme from the point of view of the participant

(Wang & Burris, 1997). Furthermore, photovoice has the potential to gather and represent more insight than typical focus groups or direct interviews, as the visual representations of the program are more impactful with an audience than transcripts from the former (Kelly, 2017). Finally, the use of photovoice as a means for data collection provides youth an extended period of time to reflect on their experiences and examine their thoughts and feelings as they examine the photographs they take (Wilson et al., 2007). Kelly (2017) used photovoice while working with Indigenous youth in the United States of America and found the youth to be more engaged and interested in the project even suggesting that the process was fun. As it pertains to this study, photovoice was first used within an Indigenous community in the United States in 1972 (Worth & Adair, 1972). Although this first project by Worth and Adair (1972) was viewed more through the lens of the researchers rather than the Indigenous Peoples, future projects such as Mekaron Opoi Doi project in Brazil have been extremely successful in gathering input from Indigenous Peoples (Feitosa, 1991). When photovoice is used as a method, it can help mitigate some of the bias that researchers may have towards what they believe to be important rather than what is important to the participants (Wang & Burris, 1997). Kovach (2009), Smith (1999), and Wilson (2008) make clear that non-Indigenous researchers working with Indigenous Peoples must listen to the participants' needs and support them not what the researcher is interested in pursuing. Photovoice provides participants a means of sharing perspectives, expertise, and knowledge and can help researchers more fully understand the needs of the Indigenous participants and allow for a more successful program evaluation

(Kelly, 2017). Photovoice is a form of storytelling and narrative, thus it is a tool that fits within Indigenous methodologies as the culture of many Indigenous Peoples is to pass on knowledge through storytelling and narratives (Beh et al., 2013; Castleden & Garvin, 2008; Kelly, 2017; Wilson, 2008). The stories and narratives often convey every day and exceptional life experiences lived in Indigenous communities. Photovoice aims to accomplish the same in one specific area, in this instance, youth sport (Wilson, 2008).

In this study the authors asked youth who participated in both Silvey's Olympic wrestling program and NAIG 2017, to show and discuss the impacts of the program on their lives through the use of photovoice. This approach also promotes the opportunity for Indigenous participants to tell their own story about the program, and give the non-Indigenous researchers the opportunity to view the program and its impacts through an Indigenous lens. Hovey, Delormier, McComber, Lévesque, and Martin (2017) discuss the importance of Two-Eyed Seeing when working with and within Indigenous communities. Two-Eyed Seeing is a way for academics and Indigenous Peoples to work together in order to look at information from both Western and Indigenous perspective (Bartlett, Marshall, & Marshall, 2007; Hovey et al., 2017). Although Silvey et al. (Submitted) had already completed an impact analysis on the Olympic wrestling program with these and other Indigenous youth, this project gives researchers the opportunity to view the program's impacts through the Indigenous youths' eyes. Viewing the research through an Indigenous lens can lead to a greater understanding of the information

presented and allow for better exchange of knowledge between Indigenous communities and researchers.

Methods

Prior to starting the study, ethics approval was obtained from the Health Research Ethics Board, of Newfoundland & Labrador (reference number: 15 273). The Band Council of the community in question granted permission and parental consent was given. Lastly, participants and their parents granted permission for the use of the images as they are presented here.

Participants

Two youth who took part in Silvey et al.'s (2018) Olympic wrestling program and qualified for the Team Newfoundland and Labrador wrestling team that competed at the NAIG 2017 volunteered to participate in the study - one transgender athlete (who was in transition during the study), and one female. The two athletes ranged from 16-17 years of age and both identified themselves as Mi'kmaq.

Procedure

Three specific research questions were asked of the youth: 1) "What does training in the Olympic wrestling program mean to you?" 2) What does competing in the 2017 North American Games mean to you?" and 3) "How has the program and competition impacted your lives within sport and outside of it?" A short 15-minute discussion was completed with each youth and a guardian to discuss what

photovoice is, the purpose of the project, the ethics of capturing photographs, and to obtain informed consent to participate. A photojournalist then worked with each youth to instruct them about basic photographic essay composition and the basics of photography. The participants were asked to use their personal cellphone cameras to capture and store images until the project was completed. Cellphones were chosen instead of giving youth cameras, as it was more practical due to the fact these youth owned cellphones and almost always had their phones with them.

The participants took photographs over a three-month period. During this time, they were training in Olympic wrestling in preparation for competition; they both competed in the NAIG 2017 (10 days), and one of them also competed in the 2017 Canada Games (7 days). After the conclusion of the three-month participant photography period the youth were each asked to create a short photo essay that captured their personal feelings about what training in the Olympic wrestling program and competing in national level tournaments meant to them. Next, the photo essays were discussed individually with the researcher while interview notes were taken. Similar to Kelly's (2017) research, the interviews were semi-structured and the researcher used four questions to guide the discussions when examining each of the selected photographs: 1) What does this photograph mean to you? 2) Why did you put this photograph in your essay? 3) How does this photograph relate to you? 4) How does this photograph explain the impact Olympic wrestling has had on your life? At times participants were asked to elaborate on comments made about their photographs.

The participants and researchers were the only ones to view the photographs. After the three-month period, and in adherence to the local ethics board directions, the photographs were downloaded to two secured hard-drives and the photographs were deleted from the cellphones. One of the hard-drives was stored at the Memorial University of Newfoundland Faculty of Medical building in a locked storage cabinet, and the other was given to the Indigenous community to which the youth belong..

Data Analysis

The results were analyzed using a thematic analysis approach. Two researchers reviewed field notes from the interviews and the photographs to ensure rigor was accomplished in five steps:

a. Both researchers familiarized themselves with the content of the notes and the photographs;
b. One researcher (DS) developed a coding system, and both researchers reviewed the system and agreed to it;
c. Independently both researchers coded the interview notes using excel software and the agreed upon coding system;
d. The coded materials were aggregated into themes;
e. During a face-to-face meeting the researchers reviewed the themes and reached consensus on any themes and codes that were of differences of opinions.

Results

The results of the thematic analyses are presented as they relate to the themes that emerged. Each theme is supported by a selected quote from a participant and linked to existing literature.

Overall the participant's enthusiasm for Olympic wrestling came across in their photo essays and during the post interview discussions. The participating youth who took part in this study attended wrestling practices two to three times per week and ran 25kms per week for three months prior to NAIG 2017. They also put themselves on strict diets, removing "junk foods" and "eating lots of vegetables". These youth often messaged other coaches around Newfoundland for support on how to improve as athletes.

Themes

Self-confidence/Self-perception: The photographs that fit this theme consist of various ideas of pride, happiness, and achievement. Some examples from the photographs for "Self-confidence/Self-perception" can be seen in Figure 9. Comments included: "I am proud to own my Canada Games singlet"; "It was an honour to accept this award"; "Wrestling isn't easy, but that didn't stop me"; "Even though we all lost we are still smiling, because wrestling isn't all about winning;" "Small achievements mean so much"; " Hard work and good behavior do not go unnoticed"; and "Your mind might be telling you to give up in wrestling, but you have to be strong enough to keep going"; "I became a better person physically and mentally". The researchers agreed that the field notes from the interviews as well as

photographs suggested strong self-confidence. This conclusion is in line with previous research with Indigenous and non-indigenous groups of youth within the same age (Hwang et al., 2017; Praxis Research/Strategy, 2015). For example, Hwang et al., (2017) showed that youth who participate in soccer also had higher self-confidence measures.

Figure 10. Examples of the theme of "Self-Confidence/Self-Perception."

Healthy Choices: The photographs that fit this theme consist of ideas of body changes, physical activity, and diet choices. Some examples from the photographs for "Healthy Choices" can be found in Figure 10. One comment made by a participant: "This is a comparison picture of mine and my family's drinks. They chose to drink Pepsi and I chose to drink water. I chose this picture because it shows my dedication to not only training but to eating health as well. As much as I wanted the pop, I knew water was the smart choice. Temptations were constantly around

me but I was strong enough to push past them." Other comments included: "This is a picture of my weight loss transformation. I chose to include this picture because wrestling has done nothing but positive things for me. I would always try to lose weight on my own but fail"; "Running not only improved my cardio for wrestling but it made my body and mind healthier"; "Salads always look bright and lively and that's exactly how they make you feel." The researchers agreed that the field notes from the interviews as well as photographs suggested a theme of healthy choices. This is in line with previous research with Indigenous and non-indigenous groups of youth within the same age (Kelly, Melnyk, Jacobson, & O'Haver, 2011; Praxis Research/Strategy, 2015; Silvey et al., 2018; Stronach, Maxwell, and Pearce, 2019). For example, a study conducted by Kelly et al. (2011) showed that youth who participate in physical activity have stronger cognitive beliefs about leading healthier lifestyles. Kelly et al, (2011) suggests that eating a healthier diet, and wanting to be more active can lead to healthier lifestyles.

Figure 11. Examples of the theme of "Healthy Choices."

Community/Team Cohesion: The photographs that fit this theme consist of team images, signed items, and team interactions. Some examples from the photographs for "Community Cohesion" can be found in Figure 11. Comments included: "…my new friends and I holding hands on our last day together at Canada Games 2017. These people were strangers just a few days before. They quickly became lifelong friends"; "We all grew so close in such a short amount of time"; "Even though wrestling is an individual sport, we are still a team"; "We were all just as excited and proud of our teammate as if it were ourselves on the mat"; "You can feel the love we shared"; "Wrestling is having a team you can be anything around. Even silly, around."

The researchers agreed that the field notes from the interviews as well as photographs suggested a theme of community/team cohesion. This is in line with

previous research with Indigenous and non-indigenous groups of youth within the same age (McHugh et al., 2015; Praxis Research/Strategy, 2015). For example, a study conducted by Praxis Research/Strategy (2015) shows that Indigenous youth who participate in sports at NAIG 2015 also felt a strong connection to teammates.

Figure 12. Examples of the theme of "Community/Team Cohesion."

Cultural Exploration: The photographs that fit this theme consist entirely of images from NAIG 2017. Some examples from the photographs for “Cultural Exploration” can be found in Figure 12. Comments included: “NAIG allowed me to be culturally vulnerable and compete in my favorite sport: wrestling. I was able to witness different Indigenous cultures while exploring my own”; “Us and our new coach in our NAIG swag representing our Indigenous culture.” The researchers agreed that the field notes from the interviews as well as photographs suggested a theme of Cultural Exploration. This is in line with previous research with Indigenous

groups of youth within the same age (Praxis Research/Strategy, 2015). For example, a study conducted by Praxis Research/Strategy (2015) shows that Indigenous youth who participate in sports at NAIG 2015 felt they had the opportunity to examine their culture, and other Indigenous cultures in a safe environment.

Figure 13. Examples of the theme of "Cultural Exploration."

Photovoice: None of the photographs fit into this theme, however some of the comments made by the youth discussed how the photo essays impacted their views about their time competing and training in Olympic wrestling. Comments included: "I felt that creating this [photo essay] made me think more about what I was doing"; "I appreciated wrestling so much more"; "Being given the chance to tell my story as I see it made me feel like I had more responsibility in the program and I felt like I was more of an adult"; "The photo-essay let me tell you exactly what the [Olympic wrestling] program means to me"; "While completing the [photo] essay I realized

how important all the stuff that comes with wrestling is, not just the wrestling, but the friends, family, and responsibility."

One additional comment a participant made which did not fit into a theme of this research study is included below:

"Wrestling helped me care for and about my body, the more I cared for and about my body the more I realized it wasn't who I was supposed to be. Through that, I realized I wasn't just an awkward teenage girl. What I was feeling was extremely different than insecurity. I didn't feel like a girl at all, and the body I was living in was making me so uncomfortable and dysphoric that I had to do something about it. The first two people I told were teammates on my wrestling team, they were super supportive and accepted me for who I was. My NAIG coach and later, other members of the NAIG team also supported me in ways I never dreamed possible. The positive response from them helped me tell the rest of my friends and family about my wanting to change my gender."

Discussion

Photovoice is a tool that fits within Indigenous methodologies and proved useful in developing a deeper understanding of the impacts of an Olympic wrestling program on youth participants. In promoting involvement and young participants to express their own thoughts and views on a program, researchers can better assess the impacts of that program through another lens. The findings of this study suggest that these participants of Silvey et al.'s (2018) study on the implementation of an Olympic wrestling program believe that the program had an impact on their self-

confidence and self-perception, choices for a healthier lifestyle, and their community/team cohesion. Furthermore, the program gave them an opportunity to explore their own Indigenous culture along with others.

Two-Eyed Seeing through photovoice allowed researchers to witness the changes the youth underwent over a three-month period from the youths' point of view and promoted involvement to choose what parts of their story they wanted to share with researchers. During this study when participants had control of their own story, it felt as though it provided them with the opportunity or occasion to decide what and how they would share what they believed to be the important impacts of the program. In this situation, photovoice was a productive tool in conducting research with Indigenous Peoples. Kovach (2009) and Wilson (2008) both identify that storytelling is an important part of traditional Indigenous life and researchers should understand this when working within an Indigenous context. Having participants create a photographic story mixes both Indigenous (storytelling) and non-Indigenous (photography) cultural practices which, can lead to a more fulfilling experience for both Indigenous People and researchers.

The participants in this study believed that participating in the Olympic wrestling program and NAIG 2017 impacted several facets of their lives. This is consistent with other research studies using qualitative and quantitative tools to examine the impact of sport on both Indigenous and non-Indigenous youth. McHugh, Coppola, and Sinclair (2013) used photovoice to examine the impacts of sport on urban Indigenous youth (youth living in non-Indigenous communities). McHugh et al. (2013) finds that participation in sport leads to improvements in

youth self-perception. In another study, McHugh, Coppola, Holt, and Anderson (2015) find that sport created a sense of belonging and led to a deeper understanding of Indigenous youths' views of where they live and from which they come. Non-Indigenous Canadians also have been shown to be impacted positively by sport programs. Leipert et al. (2011) used photovoice to examine the impacts of a curling program in a rural non-Indigenous community in southern Ontario. They show that women who participated in the program demonstrated higher levels of community cohesion. The women also demonstrated higher levels of self-confidence and consumed healthier foods while participating in the program. Hwang, Machida, and Choi (2017) used quantitative tools to examine the impacts of sport on youth, finding that participants showed increased levels of self-confidence. Thus, results from this study support theories that photovoice can be used to demonstrate the impacts of sports participation.

Limitations

One major limitation of this project was how few participants were involved. As only two youth from Silvey et al.'s (2018) wrestling program qualified for NAIG 2017 no other were eligible to take part in the study. However the two participants did demonstrate that photovoice was a tool that could be used effectively in this kind of context. Working with more participants in larger sport programs could increase our knowledge of the usefulness of this methodology in assessing the impacts of sports. The youth also discussed the impacts of the Olympic wrestling program and NAIG 2017 directly after the games were completed. This may have biased the results as youth may still have been excited about their time at NAIG. A

follow -up interview with the youth to determine if they still feel as positive about their participation and are still engaging in healthy behaviours would be appropriate.

Conclusion

This paper demonstrates that photovoice could be an effective tool when working with Indigenous communities to help researchers see the program impacts though an Indigenous lens. The youth that participated in both Silvey et al.'s (2018) Olympic wrestling program and NAIG 2017 described improvements in self-confidence, self-perception, healthy choices and community cohesion. They also described that they were given the opportunity to explore their Indigenous culture in a way that may not have been possible if it were not for sport. These youth who participated in this program have a passion for Olympic wrestling, and were proud to represent their Indigenous culture and province at NAIG 2017 and at the 2017 Canada Games.

Chapter 8: Manuscript 6

Impacts of the 2018 Newfoundland and Labrador Winter Games on youth who participated in the sport of Olympic Wrestling with Team Indigenous

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Abstract

Background: The 2018 Newfoundland and Labrador Winter Games held in Deer Lake, Newfoundland and Labrador (NL) were the first provincial games in Canada to have Team Indigenous as a region. This team gave Indigenous youth who otherwise may not have been able to attend the games the chance to participate and compete for their cultural home. Previous research has suggested that participation may lead to increases in overall health as multisport events have been shown to increase a sense of community, identity, and can lead to increases in mental health.

Objective: The objective of this study was to determine if youth who participated in the sport of wrestling at the 2018 NL Winter Games with Team Indigenous saw increases in their overall health, motivation to seek higher education, and levels of sport participation.

Methods: Seven Indigenous youth ages 12-18 years of age took part in the 2018 NL Winter Games with Team Indigenous in the sport of wrestling. Each participant completed a survey that measured sport participation, competitive sport participation, physical health, lifestyle choices, and self-worth/self-perception. Frequencies and percentages were calculated for categorical questions and mean,

range, and standard deviation were calculated for continuous variables. Content analysis was used to look for themes in additional comments given.

Results: Participants indicated that the 2018 NL Winter Games had a positive impact on their self-perception, self-confidence, diet, activity levels, healthy choices, and motivation to want to attain higher education. They also indicated that sport has guided them towards making healthier life choices. Participants stated that they would stay active after the games were completed, however the games did not have an influence on these decisions.

Conclusion: Competing in multisport events can lead to increases in perceived health and motivation to attend higher education; however, more research examining participation in more sports and regions should be conducted.

Background

Indigenous youth in Canada suffer from lower levels of overall health than their non-Indigenous counterparts (Alaghehbandan, Gates, & Macdonald, 2005; Aldridge & St. John, 1991; Edwards et al., 2008; Gartrell, Jarvis, & Derksen, 1993; Kral, 2016; Kral, Idlout, Minore, Dyck, & Kirmayer, 2011; Tousignant, 2013). There are several reasons for this deficit in health among Indigenous youth; however, the majority have stemmed from the impacts of colonialism (removal of a peoples' culture and forced assimilation) and residential schools (the way in which colonialism was carried out in Canada) (Loppie & Wein, 2009). These two factors have had long-lasting impacts on Indigenous health that has led to emotional trauma, lack of parental figures, family disruptions, lack of access to social support, and a loss of identity (Gartrell et al., 1993; Kral, 2016; Kral et al., 2011; Tousignant, 2013).

Research has shown that physical activity programs can help increase the physical and mental health of youth (Chimen et al., 2012; Desapriya, 2006; Larun, Nordheim, Ekeland, Hagen, & Heian 2006; Meyer & Gullotta, 2012; Oh, Yoshino, Rana, Lee, & Hovatter, 2015; Smith, 2012). These programs involve the use of sport to help increase youth health, and they are being implemented around the world. Specifically, some are being implemented in Canadian Indigenous communities to increase Indigenous youth health by mitigating several of the challenges that limit Indigenous youth physical activity (Silvey et al., Submitted). Through both participation and competition, sports have been shown to increase both physical and mental health by developing a sense of community, reducing the risk of several

diseases (e.g. osteoporosis, heart disease, type 2 diabetes), and increasing levels of self-confidence, motivation, and positive thinking (Chimen et al., 2012; Larun et al., 2006; Oh et al., 2015; Reverdito, et al., 2017). Competing in sports can instill a sense of common identity, belonging, and pride in an individual's nation (Calloway, 2004).

The Newfoundland and Labrador (NL) Winter Games were recently held during the month of March 2018 in Deer Lake, Newfoundland, Canada. This multisport competition was held over one week and consisted of volleyball, table tennis, badminton, skiing, curling, gymnastics, hockey, basketball, skating, and wrestling. The tournament was designed to create participation in sport, foster sportsmanship and develop the athletic skills of youth living in Newfoundland and Labrador. The 2018 NL Winter Games was the first of any winter games held in Canada to provide opportunities for athletes to compete under the banner of Team Indigenous. Team Indigenous was comprised entirely of Indigenous youth from across the province and from three different nations; Innu, Inuit, and Mi'kmaq.

Several Indigenous youth who took part in a wrestling program offered by Silvey's team in a rural Indigenous community in Newfoundland qualified to compete in the 2018 NL Winter Games with Team Indigenous. These youth competed in wrestling at the games, stayed in the athletes' village, and participated in the closing ceremonies. Team Indigenous wrestling placed third overall at the games and many of the youth placed first in their individual weight classes.

The purpose of this study was to determine if the youth who participated in both Silvey's wrestling program and qualified for the 2018 NL Winter Games had perceived improvements in their overall health as measured by self-esteem, diet,

self-perception, life choices, and motivation towards higher education. This study also examined if participation in the games had an impact on the youth's desire to continue their participation in sport (recreational and competitive). Participating with Team Indigenous in the games instilled a sense of belonging and connectedness, and resulted in healthier life choices.

Methods

Prior to starting the study, ethics approval was obtained from the Health Research Ethics Board, of Newfoundland and Labrador (reference number: 15 273).

Participants

A total of seven youth of 12-18 years of age took part in the 2018 NL Winter Games under the Team Indigenous banner in the sport of wrestling. All seven (five male and two female) were of an Indigenous heritage: five youth were Innu and two were Mi'kmaq. None of the Indigenous youth on the wrestling team were Inuit or from Inuit communities. The youth were from Newfoundland and Labrador and all of them lived on a First Nations reserve.

Survey

The research process included a quantitative survey based upon the Aboriginal Sport Circle's North American Indigenous Games 2014 Evaluation Report (2015) (Appendix 2). The research tool (both this one and the Aboriginal Sport Circle's North American Indigenous Games 2014 Evaluation Report) posed questions to participants within five themed areas: sport participation, competitive

sport participation, physical health, lifestyle choices, and self-worth/self-perception. Sport participation and competitive sport were examined to determine if youth would continue in sport in a recreational or competitive field after the games, and if participating in the 2018 NL Winter Games had any impact on their decision. In order to determine if the 2018 NL Winter Games or sport in general had an impact on the youth health, physical health and lifestyle choices were also examined. Lastly, the research tool contained questions that were developed to gain an understanding of how youth view themselves (self-worth/self-perception) and if the 2018 NL Winter Games had any impact on these thoughts.

For several of the questions, respondents were given the option to write additional comments pertaining to previously answered questions. On the final evening of the 2018 NL Winter Games all wrestling Team Indigenous participants were invited to complete a survey developed specifically for this study. All seven participants completed the survey during one-on-one sessions with the lead researcher. This gave participants an opportunity to vocalize their ideas rather than writing them down themselves. Field notes were completed to keep track of the participants' comments.

Descriptive analyses were performed for each question. Frequencies and percentages were calculated for categorical questions and mean, range, and standard deviation were calculated for continuous variables (i.e., age).

Additional comments were analyzed using a deductive qualitative analysis (content analysis) approach that allowed researchers to look for common themes among the responses (Vaismoradi, Turunen, & Bondas, 2013). Two authors (DS and

AD) coded and categorized the data into the following five main categories: a) school effectiveness; b) self-perception/self-worth; c) healthier diets; d) use of drugs/alcohol/tobacco; and e) activity levels. Authors worked independently, however, they met regularly to review coding, discuss differences, and make decisions to ensure coding consistency.

Results

All respondents indicated that sport has made a positive difference in their life choices and has helped them avoid unhealthy life choices. All respondents also indicated that their personal life choices (healthy eating, avoidance of drugs and alcohol) differ from those of their friends who do not compete in sport. Four (57%) of respondents indicated that participating in the NL Winter Games made them feel different about themselves. Six (86%) of the respondents indicated that they changed their diet in order to participate in the NL Winter Games with four (67%) of those who changed their diets suggesting they will maintain these changes. These questions allowed for additional comments, which were used in the content analysis. Content analysis results with one example for each theme can be seen in Table 13.

Table 13. Content analysis for results for additional comments given.

Theme	School Effectiveness	Self-Perception/Self-Worth	Healthier Diets	Drugs/ Alcohol/ Tobacco use	Activity Levels
Number of Comments	Three	Five	Seven	Twelve	Three
Example Comment	It changes the way I behave. I am not as aggressive at school and listen more	Normally I don't do anything, but when I am here I am happy meeting new people and having fun. I am really enjoying myself here	I stopped eating the junk food, and food that has a lot of bad stuff in it and started eating more healthy	Helped me make better choices such as not choosing alcohol and drugs and also helped me to lead a healthier lifestyle overall	I choose to do my sports and they choose to stay home and do nothing

Five (71%) of the respondents indicated that they are regularly active for more than 60 minutes per day while two (29%) indicated that they are active 20-59 minutes per day. All respondents indicated that they are likely to be physically active a minimum of three times per week following the 2018 NL Winter Games and that the games had a positive influence on this intent to be active.

Four (57%) of the respondents indicated that they believe that individuals in their hometown see them as a role model. Six (86%) of the respondents also indicated that being selected to attend the 2018 NL Winter Games had a positive influence on how others perceive them. All respondents indicated that participation in the 2018 NL Winter Games increased their confidence and six (86%) believed this confidence would help them immensely in the future.

All respondents indicated that they intend to continue participating in sport, both competitive and non-competitive, following the games. Six (86%) of the

respondents indicated that participation in the 2018 NL Winter Games as part of Team Indigenous had a positive influence on their decision to continue to be involved. However, five of these six also indicated they would likely have still come to this decision even if they had not attended the games.

When asked if respondents had travelled outside of their region to compete in sports prior to the 2018 NL Winter Games, five (71%) of the respondents indicated they had. Four of these five indicated that they had left their region for the first time a few weeks before the 2018 NL Winter Games to compete in another wrestling tournament.

Discussion

The findings of this study suggest that participation in multisport competitions such as the 2018 NL Winter Games may lead to increases in overall health through increases in self-confidence, self-perception, and diet. This study also suggests that youth being physically active in recreational sport and competitive sport may lead towards healthier life choices. Lastly, the findings raise the question that competition at major multisport events may lead to increases in motivation towards higher education.

Calloway (2004) suggests that youth sport competitions have the potential to not only increase physical health, but also can lead to increases in community cohesion, confidence, and self-perception. This study provides evidence that is consistent with Calloway's findings. Many of the youth who participated in this study felt they had improvements in all three of the above traits. One respondent indicated that they felt different about themselves because they were "surrounded

by people more like me," and another participant stated, "Being here makes me care more." It is possible that the competition and team environment of multisport competitions can create motivation and community cohesion for participating youth. Almost all of the youth indicated that competing in the games gave them a boost in their confidence that would help them in the future. This is supported by Reverdito et al.'s (2017) study that finds that youth who participate in extracurricular sport activities show higher levels of self-efficacy and confidence than those who do not. Almost all of the youth made positive changes to their diet for this competition and over half indicated they would maintain these dietary changes. Pate, Trost, Levin, and Dowda (2000) show that youth who participate in sports are more likely to eat fruits and vegetables and more likely to make healthier choices. Hills, Byrne, Lindstrom, and Hill's (2013) study, shows that small changes in diet can have a lasting impact on health and can also lead to improvements in self-confidence and self-perception. Several of these youth indicated that they made changes to their diet by simply eating "less junk food." Small changes in dietary choices as suggested by Hills et al., can have a long-term impact on the youth and help lower the chances of obesity and the adverse health consequences of being obese.

In a similar vein, Weiss, Bolter, & Kipp (2016) demonstrate that youth who participated in a sport (golf) program also had higher levels of core values (being responsible, being honest, doing schoolwork, and avoiding unhealthy behaviours) than the youth who did not participate. The youth in this study all indicated that they avoid unhealthy behaviours because of their involvement in competitive sport

and also stated that these choices are different from their friends who are not active in sport. One participant stated that "[my friends] make bad decisions such as choosing alcohol and drugs because they don't have a reason not to." This could suggest that sport participation is the reason why this youth does not drink alcohol or use drugs. Another participant directly named wrestling as the reason why he/she does not drink alcohol. These results are supported by Pate et al.'s (2000) study indicating that youth in sports make healthier life choices, and reinforces the idea that youth sport programs can lead to healthy life choices (Merkel, 2013; Weiss & Wise-Bjornstal, 2009).

The majority of the youth in this study indicated that they aspired to move on past high school towards a higher education. Pate et al., (2000) and Staurowsky et al., (2009) both demonstrate that youth who participate in sport are more motivated towards a higher education. Youth may become more motivated to attend higher education because they have gained higher levels of self-perception and self-confidence. Participating in sport and major sport competitions can also lead to increases in the ability to set and achieve goals according to Hansen, Larson, and Dworkin (2003). Combined with increases in self-worth, goal setting may allow the youth to believe that they can go further in their education and thus motivate them to do so.

Limitations

Further research should examine the impacts of sport and multisport events on the variables presented in this paper. Also, only one sport (wrestling) was investigated in this paper, other sports should be examined to determine if results

are generalizable across all sports. This project took place in one province. That being the case, historical context, resources and geography could have an influence on its applicability to other jurisdictions. Researchers in other provinces may or may not be able to use the methodology to determine if Indigenous youth competing in sport and multisport events have similar results. Another limitation is that the survey was delivered directly after the 2018 NL Winter Games completed. This may have biased the results. A similar survey should be delivered at another time and after a similar multisport event to assess the validity and reliability of these statements and the sustainability of the impact of the event. Lastly, future studies could track the participants to examine if they do continue in physical activity after the completion of the program and for what duration.

Conclusion

Many of the youth who participated in the wrestling at the 2018 NL Winter Games with Team Indigenous perceived improvements in their overall health, and motivation to attend higher education. They also indicated that they would maintain the same activity levels after the games were completed. This suggests that participation in sport and major sporting events could have a positive impact on participants. However, more research is needed to examine a larger cohort across multiple sports and regions to determine if the results presented here are sustainable and generalizable.

Chapter 9: Discussion

The primary purpose of this thesis was to examine the impact of a youth Olympic wrestling program when developed with, and implemented in, an Indigenous community.

Objectives

The first objective of this thesis was to develop a relationship built on trust with the Indigenous community in question in order to create a positive program and research project that worked to benefit the community. As seen in the relationship building section, manuscript 2 and discussed in manuscript 1, a strong relationship between the community and the researcher was made before any type of research began. This bond later expanded into other communities and the researcher developed a relationship with the Aboriginal Sport and Recreation Circle of Newfoundland and Labrador, which lead to manuscript 6. These relationships continue to this day (four years since the project began) with regular communication between the researcher, the community, participants, coaches, and sport councils. The relationships led to the Indigenous community using the researcher as a resource to build an Olympic wrestling program which they developed, managed, and sustained. An environmental scan was conducted with the community and was described in manuscript 2. In conducting the scan, the researcher learned what the Indigenous community wanted from him, and how the resulting Olympic wrestling program would look. Manuscript 2 demonstrated that the community members wanted the program, felt there was a need for it, and believed there were potential benefits of having an Olympic wrestling program in

their community. The community also instructed the researcher, on which members of the community should be trained to help the program become more sustainable, and also where the program should be conducted, and the age range of participants.

The second and third objectives of this thesis were to determine if there were any significant physical and/or mental health changes in the participating youth. Manuscript 3 demonstrated how these objectives were completed and suggested there were changes in the youth health. The changes were not significant. This lack of significance led to a more in-depth examination of the youths' physical and mental health scores. One youth from the group stood out as having experienced large changes in both physical and mental health as discussed in manuscript 4. Manuscript 4 suggested that the youth's changes many have been due to a high level of parental involvement. Although other parents/guardians demonstrated an interest in their youth participating in the Olympic wrestling program, their involvement did not compare to that of the youth's parents described in manuscript 4. As stated previously, this youth's parents purchased additional gear to train at home - outside of practice time They attended practices, followed up with the coach to determine when practices would be held, and even participated with their youth practicing in the home new moves learnt in the Olympic wrestling program. The parents also cultivated the youth's interest in becoming more physically fit by researching nutrition and cooking meals that were considered healthier as compared to previous eating choices. Parental involvement and support may have been a key factor in her growth within the Olympic wrestling program and indirectly or directly lead to improvements in physical and mental health.

The fourth objective of this thesis was to assess the meaning and value of the program to the participating youth through their own feelings about what it meant to them. Manuscript 1 and manuscript 5 discussed the use of photovoice as a method for the Indigenous youth participants to describe their own thoughts and feelings about the Olympic wrestling program and the opportunities to compete at both the 2017 North American Indigenous Games and the 2017 Canada Games. Through photovoice and interviews the youth described how Olympic wrestling and competition increased their self-confidence, healthy lifestyle choices, community cohesion. It gave them the opportunity to explore their own cultural identities.

The fifth and final objective of this thesis was to determine if a high-level wrestling competition had a positive impact on the youth's overall health (holistic health). Manuscript 6 discussed the impacts that competing in a high-level competition (provincial winter games competition) can have on the holistic health of Indigenous youth. The Indigenous youth felt that competing at the games had a positive impact on their self-perception, self-confidence, diet, activity levels, healthy choices, and motivation to want to attain higher education. In relation to the higher education statements, two of the participants have now moved on to college and/or university educations. One hopes to study to become a doctor.

Improving the Mental Health of Youth

This thesis provides insights into the way physical activity programs, implemented in collaboration with Indigenous communities, can improve the mental health of Indigenous youth (Washington, & McPhail, 2014; Sibold, et al., 2015; Warner & Dixon, 2013). As has been stated previously, the mental health of

youth living in Indigenous communities is lower than youth living in non-Indigenous communities (Laliberte & Tousignant, 2009; Moniruzzaman et al., 2009; Richmond, 2009; Tousignant, Vitenti, & Morin, 2013). Therefore, offering more sport programs that are accessible could have a positive impact on the mental health of these youth. This thesis aimed to show that Olympic wrestling can be used as a means of improving the mental health of Indigenous youth when implemented correctly following methodologies that allow for the community to use the researcher/implementer as a resource for the community to create a program that they want and need (Bishop, 2005). Not all youth who participated in the Olympic wrestling program showed significant changes in their mental health. This may have been due to the program initially only being run for a short time (10-weeks), or the small sample size of participants. With such a small sample size it may have been difficult to notice small changes among the participants. As the program continues, more and more youth are participating which could be a future opportunity to delve deeper into the implications of Olympic wrestling on the mental health of youth.

Social Determinants of Indigenous Health

The determinants of health in Indigenous communities have deep roots in colonization and the legacy impacts of residential schools (Adelson, 2005; Waldram, Herring, & Young, 2006; Wilson & Rosenbery, 2003). Participating in sports has the potential to contribute to improving youth self-confidence and well-being. As demonstrated in this thesis (specifically in manuscript 6), competing in a major sport event motivated Indigenous youth to show interest in attaining a higher education. Having these youth attain higher levels of education speaks to the impact

of one of Loppie and Wein's (2009) proximal social determinants of health, namely, education. The potential of even a few motivated youth to complete higher education and return to their home community to work towards improving the lives of their community members is important (Nguyen, 2011). While working in the community these youth could become role models for other Indigenous youth encouraging them to move on to higher education (Meier, 2015). This has the potential to create a positive cycle bridging the education gap between Indigenous and non-Indigenous Canadians (Nguyen, 2011).

Creating a Successful Program

To create successful Olympic wrestling program, the researcher first worked to nurture a relationship with the Indigenous community (Kovach, 2009; Smith, 1999; Wilson, 2008). A trust relationship was first created through phone calls and visits with community members, Elders, Band Council, and the local school. After the environmental scan was completed (manuscript 2), the researcher worked with several members of the community to begin the process of development and implementation of the program. As Wilson (2008) states working closely with the community gives ownership of the program to the community and the researcher was a resource for them to use how the community saw fit. The community had several internal drivers that aided this program: the physical education instructor who had previous experience with Olympic wrestling and was interested in coaching; the school guidance counselor and director of education who both supported the program and aided with logistics. Having many residents of the community support the project also made implementation easier as students and

parents were engaged. As manuscript 4 discusses parental involvement aided the program's success and the Band Council supported the project with funding for the youth to attend tournaments and for coaching certifications for some local residents. This community involvement was vital to the success of the program based on sustainability and the high level of performance attained by many of the participants.

This program demonstrated that Orfaly et al.'s (2005) Train the Trainer model could be used in the development and sustainability of sport programing in Indigenous communities. By training the three local community members (two teachers and one parent) on how to coach Olympic wrestling, the researcher avoided what he calls "parachute programming:" non-Indigenous individuals coming into Indigenous communities with a program but with no long-term sustainability plan. As Mueller, Carr-Steward, Steeves, and Marshall (2011) demonstrate, retention of schoolteachers in Indigenous communities can be difficult due to lack of funding. However, when this project was conducted all three of the trained community members were Mi'kmaq or married to a local Mi'kmaq person originally from the community. The trained individuals all had deep roots in the community of Miawpukek First Nation. As Patton, W., Hong, A., Lampert, J., Burnett, and Anderson (2012) suggest, these roots make it unlikely that the trainers will leave the community thus creating a sustainable program with lasting trainers. It was the goal of this thesis to have a sustainability plan in place in order to be sure the program would continue after research was completed. As of May 2019, the program is still operational, with over 20 youth (out of a total of 61 youth that are

eligible to participate) showing up regularly with several placing on the podium at the 2019 Atlantic Championships and one placing 2nd at the Canadian National Championships.

Many people in the community were excited to see their youth participating in a new sport. They supported several of their youth as they took part in NAIG 2017, the Canada Games 2017, Wrestling Nationals (2019), and the NL Winter Games (2018). Many of the participants did extremely well in these competitions and although the changes in the participant's health were not shown as significant many individuals in the community continue to support the Olympic wrestling program. This is shown through chaperoning tournaments, becoming a coach, and aiding the participants in fundraising.

Evaluating the Program

Initially when this program began, the evaluation was going to be quantitative. However, exploration of new methodologies came about through discussions with Miawpukek First Nation and other Indigenous communities and people other qualitative methods were brought into the project. These ideas were used to tell a more complete story of the impacts of the Olympic wrestling program, as described in Manuscript 1 which goes into great detail about the methods and methodologies used to evaluate the Olympic wrestling program. Manuscript 3's physical and mental health testing showed that there were positive changes in the youths' health. Most differences were not statistically significant, most likely due to a small number of participants. However, the use of photovoice, which allowed for the youth to tell the researcher their personal stories, created some of the most

useful information to move the Olympic wrestling program forward. The youth discussed the key areas where the program was successful and this helped guide the researcher and the community in changing the program to suit the youths' needs. This information also helped guide the researcher in creating the questionnaire for manuscript 6. As Beh, Bruyere, and Lolosoli, (2011) discuss, storytelling is a traditional way of passing on knowledge in Indigenous culture and photovoice is a style of storytelling. This thesis supports the notion that when working with a community it is best to work within the culture using tools that suit the needs and understandings of the people (Kovach 2009; Wilson, 2008). In the present case the use of an Indigenous tool (storytelling) to examine the impacts of the Olympic wrestling on Indigenous youth gave the researcher some of the most valuable information to move forward with the program.

Indigenous Methodologies

Part of the aim of this project was to work guided by Indigenous principles and ways of working. Indigenous methodology specifically was not one of the primary frameworks of any of the studies or the thesis. I will not focus on Indigenous methodologies in this discussion other than in this small section. For further interest in Indigenous methodologies readers should refer to Kovach (2009), Smith (1999), and Wilson (2008) among many others.

Although before starting this project I had read a lot about Indigenous methods and methodologies, I have learned through this process that knowing, and applying this knowledge are two different things. I was lucky enough to have the community guide me through this researcher project. The guidance counselor and

physical education instructor were extremely supportive of the program and aided me in the cultural "do's and don'ts" of working with youth in an Indigenous school setting. The three of us were in constant contact throughout the program and in order to keep the program sustainable I am still in regular contact with the physical education instructor.

As manuscript 1 shows, the research attempted to work with the Indigenous community under their guidance as much as possible. Manuscript 6 (competition impacts) was entirely initiated by the Aboriginal Sport and Recreation Circle of Newfoundland and Labrador, as they were interested in the holistic health benefits of competition on their youth. I was also asked to coach at the North American Indigenous Games in 2017, and help run wrestling camps across the province. At the beginning of this project I had to explain to the community what I could do if they were interested in an Olympic wrestling program, but two years later the Indigenous sport community of Newfoundland and Labrador saw how I could be used to benefit them. I became a resource for them that benefited the community. The more I learned about the Indigenous community of Miawpukek First Nation and the Indigenous sport body in Newfoundland, Labrador, and Canada, the more I hoped I would continue to be asked to work with them – either as a coach or researcher. I understood that we had created a trusting relationship between the Indigenous community of Miawpukek First Nation, the Indigenous sport community of Newfoundland and Labrador, and myself. I also understood that now they were aware of my abilities, if any of them had a use for me, they would ask. I believe I

might have a basic understanding of Indigenous methodologies, however, there is still so much more to learn.

Limitations

There are some major limitations to this thesis. The first and most important limitation to be addressed is the fact that the author of this thesis is not Indigenous. As Kovach (2009), Smith (1999), Wilson (2008) and many other Indigenous authors/researchers state, Indigenous research needs to be done by Indigenous Peoples and in the very least, work to empower Indigenous communities. In order to address this limitation, the author worked to become a resource for the Indigenous community to use to create a program that the community wanted. In addition, outside of the Olympic wrestling program researchers worked with several of the youth in the community (some were directly part of the project and others were not) guiding them towards secondary education through discussions about their own educational journey. They introduced them to university wrestling coaches across Canada, worked with universities to address admissions issues, wrote reference letters, included youth in the research process as assistants, and had them help collect data on other research projects at Memorial University of Newfoundland. The author also invited an Indigenous student from Memorial University of Newfoundland to join the research team as a research assistant. This Indigenous research assistant gained valuable research skills and has recently completed his master's degree in 2018. This is not the ideal situation, as stated: Indigenous People should conduct Indigenous research. This project however did lead to several positives: several Indigenous youth from the community benefited

from the program; the program became part of the regular physical activity after school curriculum in Miawpukek First Nation; and another Indigenous researcher was created to replace the author in future research projects involving Indigenous Peoples. The author acknowledges that this thesis has benefited him greatly, but it was the author's goal to give back to the community and work to benefit the youth there by creating a program that would lead to increased levels of health and education.

The second major limitation of this thesis is the small sample size and the tools used. The tools for mental health were appropriate at the time of data collection (2015/2016). However, since that time new tools for measuring the mental health of Indigenous youth have been created by Indigenous Peoples. These tools, such as the Aboriginal Children's Heath and Wellbeing Measure are created by Indigenous Peoples for their populations and are more culturally appropriate. They measure health from a holistic lens, and are superior to the KADS survey used in this thesis. The physical health measures were appropriate for the research; however, tests such as the Beep Test and number of push-ups in one minute may have measured youths' motivation rather than their actual physical ability. The optimal location to test physical health measures is in a laboratory. That was not an option for this thesis. Future physical health studies should look to find tools that will be more appropriate to youth's specific abilities such as the hexagon test (agility) or the y-balance test (balance) to determine if there are smaller details or differences missed by the research presented in this thesis. This project only impacted a limited number of youth and due to the small sample size, results were not quantitatively

significant. As suggested in the manuscripts, similar projects should be conducted with more youth in each community program. This project was only conducted with one community and a small number of youths participated in the research process. Other communities later became involved. However, the program was only introduced and no data was collected from these secondary communities. As Smylie and Firestone (2015) show, pan-Indigenous policies and programs are not successful due to the differing cultures and needs of various Indigenous communities in Canada. Although this program went well in the community in question, the ideas and theories behind it may not pertain to other Indigenous communities. Future programs should realize that this thesis is not a cookie-cutter recipe. Each program will need to work with Indigenous communities to address the needs of the community and its youth to ensure a successful program. If the needs of different communities overlap the information gathered could be compared as one study to increase the validity of the findings via a larger sample group.

The third major limitation was the length of the research program. Although the program continues three years after implementation, data directly linked to the program was only collected during a 10-week program window. This data had limited results as seen in manuscript 2. However, manuscripts 4 and 5 each discuss research that shows promising program results based on the continuation of the program. Future studies should be conducted over a longer period of time. This was not possible in this thesis as the community in question suggested the initial program would not be run longer than 10 weeks. The fact the program is still

ongoing demonstrates a positive reception to the program and leads the author to believe that future research over a longer period of time would be possible.

Lastly, as given the small sample size, there were many variables beyond the control of the researcher such as the number of males and females that participated. There were other variables such as the roles parents played in the students' lives before, during, and after the program was implemented, and the socioeconomic status of the youth that could not be accounted for in the contextual factors. These variables may have influenced the results of this thesis, as they were not controlled throughout the project because this thesis followed a mixed design methodology. The work showed that in the absence of control over these variables, the program still demonstrated a development of knowledge around factors influencing success, demonstrated a positive impact on the lives of participants and built relationships and laid the ground work for future work in this area. This was evident in both the qualitative and quantitative results.

Chapter 10: Conclusion

This thesis demonstrates that a highly accessible Olympic wrestling program can have a positive impact on Indigenous youths' physical and mental health. However, more research should be conducted with several more Indigenous communities in different provinces over a longer period of time to determine if these results are significant and generalizable.

The needs of Indigenous youth are many. This thesis has demonstrated that Olympic wrestling programs could guide some Indigenous youth towards a healthier lifestyle that may include higher levels of education. No one thing will reverse the legacy impacts of colonialism and residential schools; reconciliation is a trans-generational task between future Indigenous and non-Indigenous Peoples. However, every program that is sustainable, created with the Indigenous community based on its needs/wants, and has an impact on Indigenous youth, is a step in the right direction.

Future Directions

The Manitoba Aboriginal Sports and Recreation Council and I have started three more Olympic wrestling programs in the province of Manitoba. Using the successes and lessons of this thesis, we are working towards building a more simplistic program to readily train coaches in these communities. The goals of the programs are to have several more youth trained and ready to compete at the North American Indigenous Games in 2020 and to determine if the new program, when adapted for each community, will be as successful as the findings presented in this thesis.

I have also been selected by the Indigenous Sport, Physical Activity, and Recreation Council of British Columbia to run wrestling camps across BC. The long-term goal of these camps is to increase levels of participation in the sport of wrestling for NAIG 2020.

Epilogue

Any project has much more meaning when it directly impacts our own lives or the people who are close to us. As I am not Indigenous, this project could not directly impact me in the sense of rectifying the damages of colonialism or residential schools however, projects like this could be a very small part of efforts to address reconciliation. This project gave me the opportunity to examine my life through another lens. Combative sports have guided my life albeit from the sidelines, since I was 10 years of age. The positive influence of sports has helped me become the person I am today. This project not only allowed me to examine sport's influence, it also allowed me to share one combative sport with other youth that could benefit from it. I truly believe that sports, when coached and implemented correctly, can have a positive impact on the lives of youth, whether Indigenous or non-Indigenous. One of the biggest moments for me in this thesis was when one of the participants of this project during the 2017 Canada Games was asked by the Games Committee whom her role model was and she replied "Dustin Silvey." At that moment, I knew I had stood up as a role model for this youth, and I had become more than a "researcher" or "coach" to her.

Finally, I have to try to answer that original question of what helped propel my small groups of friends and me to higher levels of education. I believe it is obvious from this thesis that sports did help, but also as seen in manuscript 4, parental involvement is vital to the successes of youth. The mother of the participant in manuscript 4 was extremely supportive of the program and helped build and maintain the program in the Indigenous community. The mother's support of the

youth's journey in Olympic wrestling motivated the youth to continue to train and view the program as positive during the research process. I believe that parental involvement was the push that my friends and I had along with sport.

After completing manuscript 4, I went back to my same group of friends and asked them about their parents' influence in sports. Each of them agreed that it was their parents who motivated them to train and forced them out of bed to go to practice each and every day. My parents were the same. They drove me to practice, paid my fees, and supported me at competitions. This leads me into manuscript 6: competitions were an important part of my life as they taught me how to fail and improve. Through competition, I learned how to challenge myself and accept that if I do not succeed it is OK, because I will learn and come back stronger. This has carried over into my work life, where I apply for almost everything and I am constantly told "no." I know however, that there is always a "yes" or a "win" somewhere ahead in the future. I just have to keep learning and improving.

Sports are a great way to get youth active, but it is parental/family support and competition that give sports the power to change the lives of youth like they did mine. I hope it is not too cliché to end this thesis with my own personal metaphor:

> Youth are seeds prepared to grow into lush trees of life, basking in the golden rays of the sun. Sports can be the soil, saturated with nutrients in which the seeds can grow. Parental/family support is the rainwater that exposes the seeds to these nutrients. And lastly, like all life, the seeds compete to break out

of the soil. Competition only makes them stronger to ensure they will flourish in the outside world.

Appendix 1

Tables from Manuscript 3

Table 14. Baseline post intervention, and retention BMI scores and standard deviations for both the intervention and control groups.

BMI	Baseline Mean (SD)	Post-Intervention Mean (SD)	Retention Mean (SD)	P value
Intervention (n=9)	25.50 (5.226)	25.86 (4.421)	25.68 (4.912)	.988
Control (n=19)	28.57 (12.864)	28.95 (12.027)	28.93 (12.034)	

Table 15. Baseline, post intervention and retention beep test scores and standard deviations for both the intervention and control groups.

Beep Test	Baseline Mean (SD)	Post-Intervention Mean (SD)	Retention Mean (SD)	P value
Intervention (n=9)	4.22 (1.906)	4.28 (1.873)	3.72 (1.770)	.109
Control (n=19)	3.97 (2.366)	3.08 (2.050)	2.63 (1.606)	

Table 16. Baseline, post intervention and retention number of pushups and standard deviations for both the intervention and control groups.

Pushups	Baseline Mean (SD)	Post-Intervention Mean (SD)	Retention Mean (SD)	P value
Intervention (n=9)	17.33 (10.161)	17.00 (9.447)	18.11 (11.591)	.780
Control (n=19)	13.05 (10.690)	14.89 (10.365)	16.16 (12.424)	

Table 17. Baseline, post intervention, and retention sit and reach scores and standard deviations for both the intervention and control groups.

Sit and Reach	Baseline Mean (SD)	Post-Intervention Mean (SD)	Retention Mean (SD)	P value
Intervention (n=8)	25.13 (8.497)	26.23 (7.897)	26.63 (9.315)	.175
Control (n=17)	22.62 (6.981)	20.65 (7.435)	20.97 (6.582)	

Table 18. Baseline, post intervention, and retention grip test scores and standard deviations for both the intervention and control groups.

Grip Test	Baseline Mean (SD)	Post-Intervention Mean (SD)	Retention Mean (SD)	P value

Intervention (n=9)	34.61 (8.700)	34.78 (7.345)	35.67 (9.381)	.605
Control (n=19)	37.21 (8.107)	39.32 (9.580)	39.42 (10.527)	

Table 19. Baseline, post intervention, and retention wall sit scores and standard deviations for both the intervention and control groups.

Wall Sit	Baseline Mean (SD)	Post-Intervention Mean (SD)	Retention Mean (SD)	P value
Intervention (n=9)	103.22 (113.253)	77.22 (56.982)	128.11 (117.935)	.166
Control (n=17)	78.41 (47.885)	91.29 (78.118)	79.82 (57.961)	

Table 20. Baseline, post intervention, and retention KADS scores and standard deviations for both the intervention and control groups.

KADS Measure	Baseline Mean (SD)	Post-Intervention Mean (SD)	Retention Mean (SD)	P value
Intervention (n=9)	11.42 (5.120)	8.43 (7.711)	11.00 (6.801)	.819
Control (n=18)	11.99 (7.165)	7.80 (5.673)	11.14 (7.218)	

Appendix 2

Survey used in Manuscript 6

SCREENING QUESTIONS

First, please answer some questions to help us classify the responses.

S1. With what gender do you identify?
Male
Female
Other _____
Decline

S2. In what year were you born? _____

S3. In what region do you currently live?
Newfoundland
Labrador
Other _____
Decline

S3. Are you an Indigenous person?
Yes
No

S4. Are you Inuk (Inuit), Innu, or Mi'kmaq?
Inuk (Inuit)
Innu
Mi'kmaq
Other _____
Decline

SECTION A: SPORT PARTICIPATION

A1. Prior to preparing for the 2018 Newfoundland and Labrador Winter Games, how active were you in sport as a participant or coach?

Involved as a participant or coach 3 or more times per week
Involved as a participant or coach 1 – 2 times per week
Seasonal or sporadic involvement
Inactive
DK/Decline

A2. Do you intend to participate in sport following the 2018 Newfoundland and Labrador Winter Games?
Yes
No
DK/Decline

A3. Has the 2018 Newfoundland and Labrador Winter Games had a positive influence in your decision to be involved in in sport in the future? Please pick a number from 1 to 5 where 1 means the Winter Games has had Very Little Influence, and 5 means the Winter Games has had Very Great Influence.
1. Very Little Influence
2
3
4
5. Very Great Influence
DK/Decline

A4. Would you have arrived at the same decision regarding your future participation in sport as a participant or coach if you hadn't attended the 2018 Newfoundland and Labrador Winter Games?
Yes
No
DK/Decline

SECTION B: COMPETITIVE SPORTS

B1. Prior to preparing for the 2018 Newfoundland and Labrador Winter Games, how active were you in *competitive* sport as a participant or coach?
Involved as a participant or coach 3 or more times per week
Involved as a participant or coach 1 – 2 times per week
Seasonal or sporadic involvement
Inactive
DK/Decline

B2. Prior to the 2018 Newfoundland and Labrador Winter Games, have you ever travelled outside of your community to be involved in *competitive* sport as a participant or coach?
Yes
No
DK/Decline

B2. Prior to the 2018 Newfoundland and Labrador Winter Games, have you ever travelled outside of your region (i.e. Newfoundland or Labrador) to be involved in *competitive* sport as a participant or coach?
Yes
No
DK/Decline

B3. Do you intend to be involved in *competitive* sport following the 2018 Newfoundland and Labrador Winter Games as a participant or coach?
Yes
No
DK/Decline

B3a. How much or how little do you intend to be involved in *competitive* sport in the future? Please give your answer by picking a number on a 1 to 5 scale from 1 for Very Little up to 5 for Very Much.
1. Very Little
2
3
4
5. Very Much
DK/Decline

B3b. Has the 2018 Newfoundland and Labrador Winter Games had a positive influence in making your decision regarding future participation in *competitive* sport? Please pick a number from 1 to 5 where 1 means the Winter Games has had Very Little Positive Influence, and 5 means the Winter Games has had Very Great Positive Influence.
1. Very Little Influence
2
3
4
5. Very Great Influence
DK/Decline

B4. Would you have arrived at the same decision regarding your future participation in *competitive* sport as a participant or coach, if you hadn't attended the 2018 Newfoundland and Labrador Winter Games?
Yes
No
DK/Decline

SECTION C: PHYSICAL HEALTH

C1. On average, how much physical activity do you do?
60 or more minutes per day
20 to 59 minutes per day
Less than 20 minutes per day
Rarely participate in physical exercise
DK/Decline

C2. When you return home from the Games, how likely are you to be physically active, participating in vigorous activity a minimum of 3 times per week? Use a 1 to 5 scale where 1 means Very Unlikely and 5 means Very Likely.
1. Very Unlikely
2
3
4
5. Very Likely
DK/Decline

C3. Has the 2018 Newfoundland and Labrador Winter Games had a positive influence in making your decision regarding future physical activity? Please pick a number from 1 to 5 where 1 means the Winter Games has had Very Little Influence, and 5 means the Winter Games has had Very Great Influence.
1. Very Little Influence
2
3
4
5. Very Great Influence
DK/Decline

C4. When you were preparing for the 2018 Newfoundland and Labrador Winter Games, did you change your diet toward increased healthy eating?
Yes
No
Unable to change diet due to limited food options in my community
DK/Decline

C5a. How did your diet change? _____

C5b. Do you intend to maintain these changes following the 2018 Newfoundland and Labrador Winter Games?
Yes
No
DK/Decline

SECTION D: LIFESTYLE CHOICES

D1. What is the highest level of education you intend to pursue?
Less than High School
High School diploma
Trades certification or Post-Secondary Diploma.
University degree
Graduate Studies – Masters or PhD
I have completed my education
DK/Decline

D2. Has the 2018 Newfoundland and Labrador Winter Games had a positive influence in your decision to continue or pursue future education? Please pick a number from 1 to 5 where 1 means the Winter Games has had Very Little Influence, and 5 means the Winter Games has had Very Great Influence.
1. Very Little Influence
2
3
4
5. Very Great Influence
DK/Decline

D3. Has your participation in sport made a positive difference in other choices you have made in your life?
Yes D4a
No D5
DK/Decline D5

D3a. In what way? _____

D4. Has your participation in sport helped you in avoiding unhealthy life choices (e.g., smoking, alcohol, drugs)?
Yes D5a
No D6
DK/Decline D6

D4a. In what way? _____

D5. Do your choices in life differ from those of your friends who do not participate in sport?
Yes D5a
No D6
DK/Decline D6

D6a. In what way? _____

SECTION E: SELF-WORTH/SELF-PERCEPTION

E1. Does your participation in the 2018 Newfoundland and Labrador Winter Games make you feel different about yourself?
Yes
No
DK/Decline

E1a. In what way? _____

E2. Do others see you as a role model?
Yes
No
DK/Decline

E2a. Has being selected to participate in the 2018 Newfoundland and Labrador Winter Games had a positive influence on how others perceive you? Please pick a number from 1 to 5 where 1 means the Winter Games has had Very Little Influence, and 5 means the Winter Games has had Very Great Influence.
1. Very Little Influence2
3
4
5. Very Great Influence
DK/Decline

E3. Would you say you have more confidence having participated in this year's Newfoundland and Labrador Winter Games?
Yes E3a
No E4
DK/Decline E4

E3a. To what extent do you feel the added confidence will help you in the future? Please answer using a 1-5 scale from 1 for Very Little to 5 for Very Much.
1. Very Little
2
3
4
5. Very Much
DK/Decline

Appendix 3

Miawpukek First Nation's Letter of Support 1

OCT-06-2015 TUE 02:54 PM P. 002

Se'l A'newey Kina'matino'kuom

[redacted]

St. Anne's School

October 6, 2015

To: Dustin Silvery

Cc: Adam Dombrowski

Re: Letter of Support and Approval

Fr: [redacted] (Director of Education for St. Anne's School)

To whom it may concern:

I am writing this letter you to inform you that the community of Conne River, NL would like to give you full support to complete you needs assessment for the combat sport program you are hoping to implement here. Your presentations and sample classes on the day of March 30th were well received by faculty, staff, the students, and the Band council. You have our full support to proceed with this research endeavor and are welcome into our community at your earliest convenience.

If you are or anyone else should require any further information please do not hesitate to contact us.

Sincerely,

[redacted]

Appendix 4

Miawpukek First Nation's Letter of Support 2

Se't A'newey Kina'matino'kuom

[redacted]

St. Anne's School

November 17, 2015

To: Dustin Silvery

Cc: Adam Dombrowski

Re: Letter of Support and Approval

Fr: [redacted] (Director of Education for St. Anne's School)

To whom it may concern:

As follow up to a letter that was forwarded to you regarding a needs assessment for the combat sport program that is currently being implemented at St. Anne`s All Grade School we would further like to continue providing support and approval for this program. As part of this process we understand that you would like to administer physical and well-being testing to selected groups of students here at St. Anne`s. We believe that this program is beneficial to our students and we would like to provide approval for this testing and continue with this process in order to provide enrichment for our students.

If there is any additional information that you require in order to continue with your research please do not hesitate to either contact personnel at the school or request assistance to facilitate your research.

Thank you,

[redacted]

Director of Education for the Miawpukek Band Council

[redacted]

Appendix 5

Randy Ralph's Letter of Support

NLAWA

[redacted]

October 16, 2015

Dear Mr. Silvey,

The Newfoundland and Labrador Amateur Wrestling Association fully supports your endeavors to begin a wrestling program in Conne River as a part of your Memorial University Masters Program.

As you may already know I am involved in developing a wrestling program in the Innu community of Sheshatshiu. I traveled to the community twice and the athletes have been to Newfoundland four times in the past two years. In 2014 I took them to the School Sport Newfoundland and Labrador High School Provincials in Avondale, to the 2014 Newfoundland and Labrador Winter Games in Clarenville, and to the 2014 North American Indigenous Games in Regina, Saskatchewan. For all of the wrestlers it was their first year training in the sport and they performed exceptionally well. There are two coaches who train the wrestlers in Sheshatshiu, Collin Baikie who is a professional MMA athlete training out of the Tri-Star Gym in Montreal, and Tshetshukus Benuen who is a student assistant in Sheshatshiu Innu School. Collin can only train when he is not in Montreal and it is Tshetshukus who really keeps things alive there. In February 2015 year the Innu wrestlers from Sheshatshiu travelled to Port aux Basques to compete at the School Sport Newfoundland and Labrador High School Wrestling Championships and the male team won the provincial title.

I have found that the kids who connected with wrestling have a much better self-image of themselves. Young athletes say to me that the sport changed their life in that many wanted to improve their diets and lifestyle or to go to university or college. Many felt that the community saw them as role models and gave them a wealth of support on social media when they were away competing. What better medicine for mental health, not just for the individual athlete, but for the whole community?

My dream is to have a wrestling/MMA program in all First Nations Communities in the province. Sheshatshiu, Natuashish, Nain, St. Georges, and Conne River. Your program would be adding one more link to the chain.

As a member of the Newfoundland and Labrador Aboriginal Community I think what you are doing is absolutely wonderful and if there is anything I can do for you whatsoever please let me know.

Randy Ralph (NLAWA President)

Appendix 6

Sport Calls to Action

From the Truth and Reconciliation Act (2015, p. 10):

87. We call upon all levels of government, in collaboration with Aboriginal peoples, sports halls of fame, and other relevant organizations, to provide public education that tells the national story of Aboriginal athletes in history.

88. We call upon all levels of government to take action to ensure long-term Aboriginal athlete development and growth, and continued support for the North American Indigenous Games, including funding to host the games and for provincial and territorial team preparation and travel.

89. We call upon the federal government to amend the Physical Activity and Sport Act to support reconciliation by ensuring that policies to promote physical activity as a fundamental element of health and well-being, reduce barriers to sports participation, increase the pursuit of excellence in sport, and build capacity in the Canadian sport system, are inclusive of Aboriginal peoples.

90. We call upon the federal government to ensure that national sports policies, programs, and initiatives are inclusive of Aboriginal peoples, including, but not limited to, establishing:

i. In collaboration with provincial and territorial governments, stable funding for, and access to, community sports programs that reflect the diverse cultures and traditional sporting activities of Aboriginal peoples.
ii. An elite athlete development program for Aboriginal athletes.
iii. Programs for coaches, trainers, and sports officials that are culturally relevant for Aboriginal peoples.
iv. Anti-racism awareness and training programs.

91. We call upon the officials and host countries of international sporting events such as the Olympics, Pan Am, and Commonwealth games to ensure that Indigenous peoples' territorial protocols are respected, and local Indigenous communities are engaged in all aspects of planning and participating in such events.

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