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Perceived Wholistic Health and Physical Activity in Kanien'kehá:ka Youth

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Abstract

Although there has been a push to reduce the conceptual gap between Onkwehonwe and more universally accepted western measures of health, few culturally relevant measures are available that have been customized for use at the community level. The main purpose of this pilot study was to assess the relationship of perceived wholistic health with self-reported physical activity and television-watching in a sample of Kanien'kehá:ka youth (n=35) living in a Kanien'kehá:ka (Mohawk) community. To do this we developed a culturally relevant measure of perceived wholistic health that was supported by the Onkwehonwe idea of balance as reflected in the symbolism of the Medicine Wheel. Results from the pilot study show that youth who live in balance tend to be more physically active and to watch less television during the week and on weekends compared to youth who do not live in balance. From a practice perspective, study findings suggest that there may be some merit to promoting physical activity and reducing television watching through interventions that nurture wholistic health or balance rather than taking a pure problem-based approach to prevention. Challenges remain, however, to operationalizing subjective concepts like wholistic health within a model of western science.

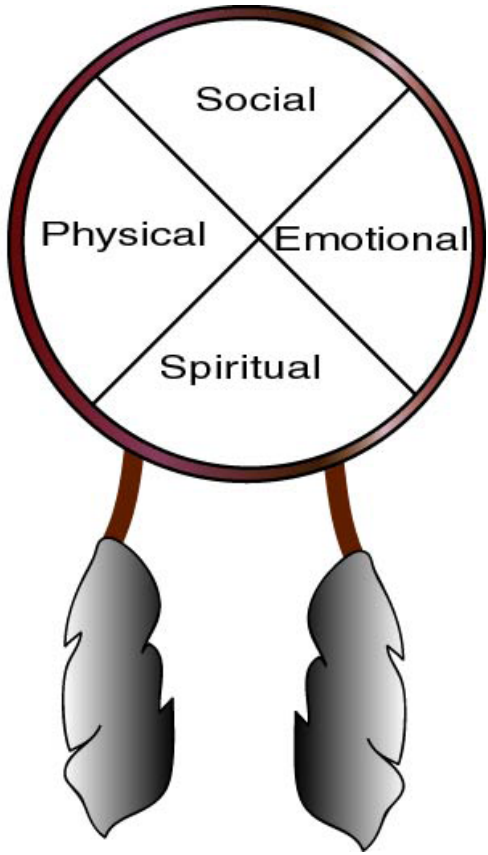
Introduction

Central to many Onkwehonwe[1] philosophies of health are the ideas of balance, interdependence, and wholistic health. For many Onkwehonwe, including the Kanien'kehá:ka (Mohawk) people, to be healthy is more about well-being than it is about the absence of physical ailments (*Haudenosaunee Runner*, 2000). To be sick is to be living out of balance. To be healthy or well means more than having a body that is free from physical ailments because the physical part of the self is connected to the other aspects of the self, each of which needs to be considered when thinking about the meaning of health or well-being. The meanings of balance, interdependence, and wholistic health are captured in the symbolism of the Medicine Wheel (Figure 1) which, although it originated among the Plains Indians (Mazzola, 1988), is

1 We use the term Onkwehonwe to refer to the real people: "All things of the world are real, material things. The Creation is a true, material phenomenon, and the Creation manifests itself to us through reality. The spiritual universe, then, is manifest to Man as the Creation, the Creation which supports life. We believe that man is real, a part of the Creation, and that his duty is to support Life in conjunction with the other beings. That is why we call ourselves Onkwehonwe — Real People" (Akwesasne Notes Mohawk Nation, 1995: 73).

recognized by many other Onkwehonwe nations because it resonates with their local beliefs, values and traditions.

Figure 1: The Four Domains of Health as Represented in One Depiction of the Medicine Wheel



As a framework for thinking about the philosophy of health, the Medicine Wheel exists in multiple forms and has been applied in a number of different ways (Hart, 2002; Margot and Lauretta, 2006). One version of the Medicine Wheel, offered by a Kanien'kehá:ka (Mohawk) physician, views each person as having the potential to develop capacities related to their spiritual, emotional, physical, and social self (Montour, 2000). Spirituality is the part of the self that believes in the connection of all things, a sense of connectedness that allows for an inner awareness of the unity of all things, either animate or inanimate. Emotionality is the part of the self that touches all other things through feeling. The physical dimension is the aspect of self that recognizes

and nurtures the body and the environment. The social dimension concerns the social relations that one has through their interactions with others in the greater circles or networks of relationships of which they are a part such as the family (including extended family), the community, and the broader social systems and natural environment. These four areas of the self are interrelated such that if any aspect of the self is out of balance or harmony so is one's health, and thus their overall well being. As put by one community member,

> *If one or more of the spokes of your bicycle wheel are broken, then the whole wheel is out of balance.*

The centre of the Medicine Wheel, the point of convergence of the four aspects of self, is referred to as the point of self-determination. This point is said to reflect the will of a person or group to influence the course of their lives (Bopp et al., 1984).

For the Kanien'kehá:ka people, the Medicine Wheel resonates with their teachings of balance and wholism that have been passed down through the oral tradition and which also can be found in the Great Law of Peace and the Thanksgiving Prayer (*Haudenosaunee Runner*, 2000). There are programs that promote healthy living in the community of Kahnawake and these programs use the Medicine Wheel so community members will associate their intervention activities with the messages of wholistic health and balance. One such program is the Kahnawake Schools Diabetes Prevention Project (KSDPP), a community-based participatory research project aimed at reducing the prevalence of risk factors for the development of type 2 diabetes in future generations of children and youth (Macaulay et al., 1997). KSDPP also is the context for this study. KSDPP activities aim to promote active living, healthy eating and a positive attitude through promoting balance. Delormier et al.'s (2003) qualitative study found that KSDPP intervention strategies relied upon role modeling and other socially based practices such as gathering at a meal and walking as a family, all of which are firmly grounded in local values. This shows that the social context of intervention activities needs to be considered because it nurtures the emotional, the physical, and the spiritual aspects of the self. In addition, we find that community members have been the driving force behind getting the program off the ground (Bisset et al., 2004) and in making decisions about how the project is governed (Cargo et al., 2003a). This makes us think about the point of self-determination which

is the centre of the Medicine Wheel and is reflected in KSDPP charting its course. Self-determination is an important aspect of health for individuals as well as the groups of which individuals are a part. And finally, although the Medicine Wheel provides the framework for the KSDPP logo, the foreground is anchored in eight expressions of local identity which include the strength of the circle, the three clans (i.e., Bear, Wolf, and Turtle), a lacrosse player, the sun, important foods of the Iroquois (i.e., corn, strawberries, apples), the elder and the child, eagle feather and the colour purple (www.ksdpp.org) (see Figure 2). The continuity of the circle embodies the wholistic worldview that everything is connected to everything else (Montour, 2000) and the colour purple, for example, is significant because it represents a healing colour. Programs like KSDPP are present to help their people put the philosophy of wholistic health into practice as part of daily living. For many Onkwehonwe, it is through the practice of culture and traditional ways that well-being is created and maintained.

Figure 2: The Logo of the Kahnawake Schools Diabetes Prevention Project (KSDPP)



We must be careful to remember that there is no one symbol that can capture how Onkwehonwe think about their health and well-being because of the important differences that exist in their beliefs, values, and traditions (Calliou, 1995; Graveline, 1998). Although the Medicine Wheel has been adapted for local use by many nations, it is not a universal symbol (Hart, 2002; Margot and Lauretta, 2006). It is a symbol that resonates with the beliefs, traditions, and values of many Onkwehonwe such as the Cree, Dakota, Lakota, and Blackfoot, but not all nations. The Inuit people, for example, do not have belief systems that identify with the Medicine Wheel. There is a real danger that the Medicine Wheel could be seen as a universal symbol of health and minimize important differences between Onkwehonwe nations. It is important to remember that each Onkwehonwe nation is unique and their identities are expressed through their own symbols. Even though the Kanien'kehá:ka people use the Medicine Wheel, the circle wampum is their own symbol of balance and harmony; it is a symbol that recognizes the strength of the people and their culture. We use the Medicine Wheel here as a way for non-Onkwehonwe researchers to start thinking about health as they work alongside the Onkwehonwe and because, as a conceptual framework, it is a way to think about health in fighting the obesity epidemic.

Obesity is a global health problem in Onkwehonwe and non-Onkwehonwe populations and has been declared a public health priority. Available evidence shows that 42 percent of First Nation adolescents living in Canada have an unhealthy body weight. Based on self-reported height and weight, 28 percent are considered overweight and 14 percent are obese for their age and gender (National Aboriginal Health Organization, 2005). The excess body weight places this generation of Onkwehonwe adolescents at greater risk for the future development of chronic diseases such as type 2 diabetes and cardiovascular disease.

Physical inactivity is a major risk factor that contributes to the development of obesity and type 2 diabetes. Unfortunately, more and more youth are physically inactive and/or are spending too much time engaged in activities that are considered sedentary like watching television and playing hand-held video or computer games. Results from the 2002/03 First Nations Regional Longitudinal Health Survey show that 90 percent of youth participate in weekly physical activity; however, only 45 percent of youth are considered "sufficiently active" because they participate in at least 30 minutes of moderate to vigorous activity most days of the week (National Aboriginal Health Organization, 2005). Although there is limited information available that fol-

lows the physical activity patterns of Onkwehonwe children and youth across the life course, information on non-Onkwehonwe populations suggest that physical inactivity tracks from childhood to adolescence and from adolescence to adulthood (Clarke and Lauer, 1993; Kelder et al., 1994; Thompson et al., 2003). Some evidence even suggests that physical activity levels decline from childhood to early adolescence (Koezuka et al., 2006; Sallis, 2000).

Available evidence suggests that adolescents who are regularly involved in sport and physical activity benefit physically, emotionally, intellectually, and socially. Getting regular physical activity has beneficial effects on physical well-being by reducing the risk of chronic disease and encouraging a healthy body weight. For example, active youth show lower levels of adiposity than do youth who are less active and who spend more time watching television (Tremblay and Willms, 2003; Janssen et al., 2005). They also show enhanced skills, improved muscular strength and endurance, higher bone density, and better flexibility as compared to inactive youth (Wankel and Berger, 1990; Côté and Hay, 2002). The benefits of regular physical activity also extend to emotional well-being. Regular youth involvement in physical activity is related to decreased stress and fewer psychological health complaints (Haugland et al., 2003), increased positive mental health (Mutrie and Parfitt, 1998), and even better academic achievement (Dwyer et al., 2001). On a social level, sport and physical activity opportunities provide teens with a context to engage in positive interactions with peers and supportive adults (Wankel and Berger, 1990). Such experiences can also foster civic engagement (Elley and Kirk, 2002). These findings provide strong evidence for the contribution of physical activity and sport to physical, emotional, intellectual, and social health. Taken together, these multidimensional outcomes are consistent with an Onkwehonwe view of wholistic health. We hypothesize that youth who live in balance would be more likely to participate in regular physical activity and sport and watch less television.

The main purpose of this pilot study was to assess the relationship of perceived wholistic health with self-reported physical activity and television-watching in a sample of Kanien'kehá:ka youth. A secondary objective was to develop a multidimensional cultural measure of perceived wholistic health (PWH) by involving youth in its development. Based on the teachings of the Medicine Wheel, it was hypothesized that dimensions of perceived wholistic health (i.e., spiritual, social, emotional, and physical health) would be correlated or inter-dependent and that overall perceived wholistic health (i.e.,

independent variable) would be related to healthful orientations towards physical activity and television watching (i.e., dependent measures).

Setting

Kahnawake is a Kanien'kehá:ka (Mohawk) community of approximately 7,200 people, located 15 miles south of Montreal, Canada. In 1985, 12 percent of adults aged 45–64 had documented type 2 diabetes, twice the rate of the general population of the same age (Macaulay et al., 1988). The high prevalence of type 2 diabetes led to the implementation of a community-based diabetes prevention project, the Kahnawake Schools Diabetes Prevention Project (KSDPP) (Macaulay et al., 1997), which has been ongoing since 1994. This study is part of the larger KSDPP.

Research Approach

This study was guided by the principles of participatory research (Green et al., 1995) and democratic decision-making process of the Kanien'kehá:ka that is reflected in the management of KSDPP (Cargo et al., 2003a). KSDPP is based on a partnership established between the KSDPP Community Advisory Board (CAB), KSDPP Staff, and KSDPP Researchers. The researchers' interest in youth empowerment was supported by the CAB and led to a successful grant application to engage high school youth, who had not been a primary KSDPP intervention focus. The study was managed and implemented in the community. Community members were involved throughout, including managing the budget and participating in hiring of the coordinator, who was a community member in her twenties (Lisa Peterson). The team members included the coordinator, researchers and a KSDPP Staff member. This group met about every three months, with small meetings between the lead researcher (Margaret Cargo) and coordinator occurring weekly, and provided monthly updates to both the KSDPP Research Team and CAB for discussion and review.

To develop the measure of perceived wholistic health (PWH), the participatory research process involved gathering feedback from a group of four youth co-researchers (ages 16 to 18) who expressed interest from the local community high school, the parents' school committee and a sub-committee of representatives from KSDPP which included academic researchers and community representatives.

At the end of the study, the results were first presented orally to the CAB by a team of youth, the coordinator and the lead researcher, then an article was written by the co-ordinator and the lead researcher and published in the community health bulletin, and finally results were presented to a national youth conference by the youth co-researchers and the coordinator.

Methodology

The methodology is presented in two parts. The first part reviews the process by which the measure of perceived wholistic health was developed in partnership with the community. The second part discusses the relationship between this measure of perceived wholistic health to youth physical activity and television watching. This research followed the KSDPP Code of Research Ethics (Macaulay et al., 1998) and was reviewed and approved by the CAB, the Board of Directors of the community schools, and the Université de Montréal Research Ethics Board.

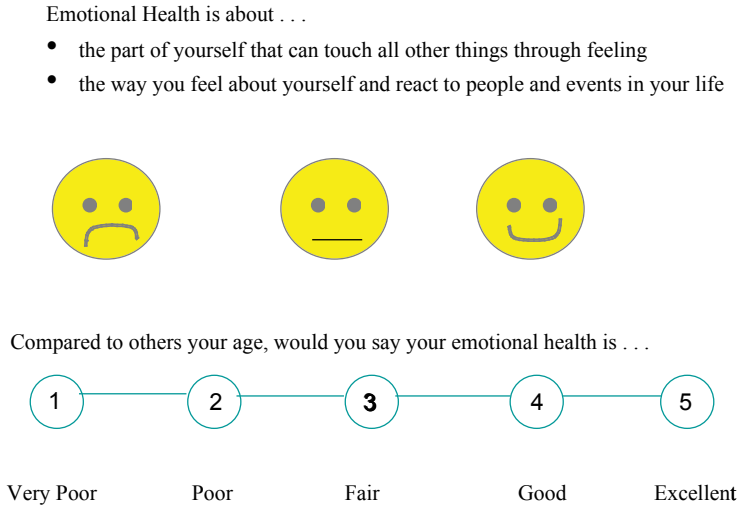
Measurement Development

Although there has been a push to reduce the conceptual gap between Onkwehonwe and more universally accepted western measures of health, few "locally customized culturally relevant measures" are available in the published literature (Smylie and Anderson, 2006). We sought to develop a culturally relevant measure of perceived wholistic health that was supported by the Onkwehonwe idea of balance and interdependence (Bopp et al., 1984; Ross and Ross, 1992; Montour, 2000).

The measure of perceived wholistic health was developed in the context of engaging youth as future peer group leaders in diabetes prevention. As part of a youth empowerment intervention, the youth committee met three times to provide input into question selection, wording, response format, and question lay-out. The project coordinator had a strong grounding in cultural approaches to health and wellness. Her input into the development of the measure was substantial. She and the lead researcher were responsible for engaging the youth, whose input was invaluable in shaping the measure. As one example, youth felt it was important for spiritual health to respect spiritual beliefs as influenced through their culture as well as more recent Christian influences. The challenge then was to illustrate this diversity in a way that was acceptable. The youth, coordinator and researchers were interested in using a visual representation of the Medicine Wheel in the question. To inform question formatting and content, additional input was sought through a focus

group of nine youth (ages 13 to 17) from a local community organization. The group was facilitated by the coordinator who was trained in focus group methods (Krueger, 1988) by the lead researcher. Focus group participants and youth co-researchers provided recommendations to feature each aspect of the Medicine Wheel with a general definition accompanied by visual images which would allow for subjective interpretation of each domain. Following this suggested format, we used the response categories ("very poor," "poor," "fair," "good," "excellent") from the perceived overall health question in the Canada Health Promotion Survey (Statistics Canada, 1988) for youth to rate their emotional, spiritual, physical, and social health. The example of perceived emotional health is provided in Figure 3. The participatory process by which the measure was developed reflects co-learning and mutual capacity-building between the youth, the coordinator, and the participating researchers (who were external to the community). Through discussion, each group of participants was able to accommodate the perspective of the other. To give an example of this, the youth and the coordinator had local knowledge of wholistic health which they shared with outside researchers. The researchers thus came to understand wholistic health through these stories, the honest exchange of information and the meaning it had in the lives of the youth and the coordinator. The researchers brought skills in how to measure concepts and shared this information with the youth and the coordinator. This study reflects the exchange of knowledge between people with different experiences and expertise and was able to accomplish something that neither group

Figure 3: Operationalization of Perceived Emotional Health.



could have done on their own. This is one reason why participatory research is so important.

We were able to establish the face and content validity of the PWH measure based on the combined input from: a) the youth co-researchers and focus group participants; b) CAB members in their roles as elders, parents, professionals, and youth; and c) KSDPP academic researchers. Relying upon both community members and academic researchers to establish face and content validity is consistent with participatory research guidelines (Green et al. 1995) which recognizes the complementary expert knowledge that academic researchers (e.g., measurement) and community members (e.g., culture) bring to bear.

Physical Activity, Television-watching and Perceived Wholistic Health

Participants. A convenience sample of 35 youth from grades 7 to 11 living in Kahnawake and attending the community high school participated. Participants' mean age was 14.4 years (SD=1.65). Sixteen girls (46%) and 19 boys (54%) agreed to complete the study with 54% of the youth attending grades 7 to 8, and 46% in grades 9 to 11.

Procedure. The self-report survey was administered to youth during their school lunch hour. The survey took about 15 minutes to complete. Consent forms were administered through the school and signed by parents and youth. Of the 40 consent forms received for this pre-test, 35 youth completed the survey for a response rate of 88%.

Measures. Youth were asked to give information on their age, gender, and their perceptions of perceived wholistic health, physical activity levels, and television watching.

Perceived Wholistic Health. A multi-dimensional measure of perceived wholistic health (PWH) was developed by operationalizing the Medicine Wheel into a four-item index comprised of single indicators for each of perceived spiritual, social, emotional, and physical health. Youth had no difficulty understanding or completing the questions. The four-item PWH measure was internally consistent (α =.70). An ordinal scale of PWH, guided by the idea of balance, was constructed based on the number of categories endorsed as "very good" or "excellent" for each of self-rated social, spiritual, emotional, and physical health. Of all youth, 20% (N=7) endorsed four categories (high), while 66% (N=23) endorsed one to three categories (moderate) and 14%

(N=5) did not endorse any categories (low). This categorization of PWH was used as the grouping variable in the analysis.

Physical activity. Physical activity was assessed through self-report using previously validated indicators (Centers for Disease Control and Prevention, 1999). These questions asked youth to report on the frequency, in the last week, of: a) sweating and breathing hard during physical activity bouts of at least 20 minutes duration; b) exercising to strengthen or tone muscles; and c) participating in physical activity for at least 30 minutes where youth did not sweat or breathe hard. Youth also reported whether they were involved in physical activity outside of school at least 3 times per week for at least 20 minutes at a time. Responses were measured on a 5 point ordinal scale from "most of the time" to "never."

Television watching. Youth reported the average amount of time (in hours) of television watched on weekdays and on the weekend using questions from the Youth Behavioral Risk Survey (Centers for Disease Control and Prevention, 1999).

Data Analysis

Descriptive analyses were performed to assess whether the measures were normally distributed and to assess the degree to which the different measures were correlated. The Kruskall-Wallis one-way analysis of variance test was used as the dependent measures (physical activity and television watching) were not normally distributed or violated the assumption of homogeneity of variances (Pett, 1997). This type of statistical test allows us to look for differences across groups of youth falling into the categories of low PWH, moderate PWH, and high PWH on the dependent variables of physical activity and television watching. Data were analyzed using SPSS-PC (SPSS Inc., 1999) and PEPI epidemiological software (Abramson and Gahlinger, 1999). The level of significance was set at 0.05.

Results

Variable means and standard deviations are reported in Table 1. As shown in Table 2, four of six possible correlations between perceived social, emotional, spiritual and physical health were statistically significant.

Table 3 shows us that 5 of 6 measures of physical activity and television watching are related to overall PWH. These correlations are considered weak (.3) to moderate (.6) in strength.

Table 1: Means (Standard Deviations) for Perceived Health and Self-reported Physical Activity and Television-watching Variables.

	Measurement	*Scale Response*	*N*	*Mean*	*(SD)*
Perceived Health					
Perceived Social Health	5 point Likert	1. very poor 2. poor 3. fair 4. good 5. very good	34	3.41	(.96)
Perceived Spiritual Health			34	3.68	(.88)
Perceived Emotional Health			34	3.41	(.99)
Perceived Physical Health			33	3.85	(.91)
Self-reported Physical Activity and Television Watching					
Physical activity: toning	Interval	# days exercised to strengthen or tone muscles in the last week	34	4.38	(2.2)
Physical activity: exertion	Interval	# days of sweating and breathing hard while exercising in last week	34	4.26	(1.9)
Physical activity: did not sweat	Interval	# days participated in physical activity for at least 30 minutes but did not sweat or breath hard	34	3.53	(1.9)
Physical activity: regular exercise outside of school	Ordinal	1) most of the time, 2) usually, 3) once in a while, 4) hardly ever, 5) never	34	1.49	(.66)
TV watching: weekday (hrs)	Interval	# hrs. watched on average weekday	34	2.76	(1.6)
TV watching: weekend (hrs)	Interval	# hrs. watched on average weekend	35	3.04	(1.7)

Table 2: Pearson Correlation Matrix for Perceived Emotional, Social, Physical and Spiritual Health Questions.

	Spiritual Health	*Social Health*	*Emotional Health*	*Physical Health*
Spiritual Health	1.0	.42** (34)	.30 (34)	.12 (33)
Social Health		1.0	.48** (34)	.47 ** (33)
Emotional Health			1.0	.34 * (33)
Physical Health				1.0

* p<.05 (2-tailed), ** p<.001 (2-tailed)

Results from the Kruskall-Wallis one-way analysis of variance tests show us that PWH did not differ by gender (χ^2=1.2, p=.50) or age category (χ^2=1.3, p=.53). For physical activity, sweating bouts of at least 20 minutes in the last week (H=8.2$_{df=2,}$ p<.05), toning muscles in the last week (H=6.3$_{df=2,}$ p<.05) and regular physical activity outside of school in the last week (H=10.3$_{df=2,}$ p<.05) were found to differ by level of PWH. Watching television on weekdays (H=9.4$_{df=2,}$ p<.05) and weekends (H=6.8$_{df=2,}$ p<.05) were also found to differ by level of PWH. Post hoc analysis revealed significant differences to reside between groups 1 (low PWH) and 3 (high PWH) for the physical activity and television watching measures. These findings suggest that youth who tend to live in balance also tend to be more physically active and to watch less television during the week and on weekends.

Table 3: Spearman Correlations for Variables Related to Perceived Wholistic Health, Physical Activity and Television Watching in a Population of Kanien'kehá:ka (Mohawk) Youth.

	PWH
Sweating for at least 20 minutes.	.43** (34)
Strengthen and toning muscles.	.43** (34)
Exercised but did not sweat.	.01 (34)
Regular physical activity outside school.	-.33* (35)
Hours watching TV on a weekday.	-.60*** (34)
Hours watching TV on the weekend.	-.49** (35)

* p<.05 (2-tailed) ** p<.001 (2-tailed) *** p<.0001 (2-tailed)

Discussion

Key findings suggest that Kanien'kehá:ka youth living in balance tended to be more physically active and watch less television than those youth experiencing disharmony. The relationships uncovered here are consistent with Onkwehonwe peoples' wholistic view of health (Calliou, 1995; Graveline, 1998) as well as the empirical literature which shows that youth who perceive their health to be better tend to engage in more physical activity, to consume less alcohol and to use less tobacco (Aarnio et al., 2002; Bryan and Rocheleau, 2002; Johnson and Richter, 2002; Pastor et al., 2003). In the words

of the youth coordinator of this participatory research study, for Kanien'kehá:ka youth to live in balance it is important for them to be in touch with their culture and to be part of a healthy strong Onkwehonwe society (see text-

Ahkwe shat'o ierahkwe
When Everything was Natural

Onkwehonwe means Real People in the Kanienke'ha language. To be an Onkwehonwe is to be of indigenous descent. Prior to the introduction of Western culture into indigenous society, the Onkwehonwe people were free of many modern diseases and ailments; including type 2 diabetes.

In the world today, Onkwehonwe people are overwhelmed with type 2 diabetes; it affects each and every indigenous person, and is a dominant factor in the decline of indigenous health.

With the introduction of western culture, indigenous people have experienced "progress," watched man land on the moon, watched planes fly, and developed into exactly what western society intended them to become — exactly like westerners.

Along with the assimilation of western culture into Onkwehonwe society, indigenous people have become prone to carrying extra body weight, living in a stressful, unbalanced, and sometimes complacent existence. These new habits have made Onkwehonwe people more apt to develop diseases such as type 2 diabetes, and even more prone to the devastating consequences.

Historically, Onkwehonwe people used physical activities as a means to heal the sick. For example, the game of lacrosse is encircled with spirituality, and traditionally was used as a medicine. The men played the game for the Creator asking him to heal the person who was ill. The balance, the good mind, and the simple action of participation had a great effect on the person who was ill. The balance and the harmony allowed the person to once again become whole. This is one example of natural balance.

This is what is missing in modern indigenous society. To be a Real Person, or Onkwehonwe means to exist naturally. This is what indigenous people are forgetting. The youth are attempting to learn, and realize the importance of balance. The balance and the natural rhythm of life is the key to becoming a healthy strong Onkwehonwe society — in all aspects — once again. If the youth begin to return to their natural ways of existence, perhaps type 2 diabetes will not have such a devastating affect on the generations that have yet to be born.

Ahkwe shat'o ierahkwe — When everything was natural.

Lisa Peterson, Bear Clan

box).

From a practice perspective, study findings suggest that there may be some merit to promoting physical activity and reducing television watching through interventions that nurture wholistic health rather than taking a pure problem-based approach to prevention. This means rethinking the categorical and disease-driven approach to the delivery of prevention programs, which is largely based on the medical model. Such approaches to prevention tend to be more strongly guided by epidemiological (e.g., the prevalence of obesity) and behavioural assessments of health (e.g., increasing moderate to vigorous physical activity) and place less emphasis on the broader social and historical contexts of wholistic health and quality-of-life within which behaviours such as physical activity and television watching are embedded. If one examines the well-known Precede-Proceed model of health promotion planning (Green and Kreuter, 1999), a medical model approach to prevention would start with the epidemiological assessment (the disease) whereas an Onkwehonwe approach to health planning would be more strongly informed by the social assessment (wholistic health) and build on youth strengths and assets. The long-standing approach of wholistic health and well-being that has been germane to Onkwehonwe societies worldwide shares some similarities with contemporary health promotion approaches such as positive youth development (Flay, 2002; Flay and Allred, 2003) and youth empowerment (Cargo et al., 2003b). These approaches actively involve youth in contexts that nurture their emotional, mental, social, spiritual and physical health to promote positive developmental outcomes such as self-esteem, identity, leadership abilities, participatory competence, enhanced learning outcomes (Riecken et al., 2006).

We are starting to see many excellent examples of programs in Onkwehonwe communities that integrate a wholistic or positive youth development approach with physical activity. In the downtown eastside of Vancouver, British Columbia, (Canada), the *Aboriginal Youth First Program* engages disconnected youth through a combination of drop-in, structured, and competitive activities that also provide youth with leadership training, skills training, and basic life skills. The *Akwe:go* program is offered to children ages 7 to 12 years through 27 Indian Friendship Centres in the province of Ontario (Canada). The program provides recreational and after-school programs in addition to a personalized plan of action for each participant and integrates teachings from elders. A recent discussion paper on youth development for young Indigenous Australians places physical activity, sports,

and active living as a means for promoting positive development outcomes (Averis, 2003). There are likely numerous other youth programs that include sports and recreational activities such as camping, for example, as part of a broader approach to promote health and well-being. Unfortunately, there is no compendium of positive youth development or physical activity programs among Onkwehonwe nations making it difficult for this knowledge to be shared across communities within and between countries. This would benefit the promotion of physical activity and the role of physical activity in prevention of obesity and diabetes. Although there may be some merit towards integrating intervention strategies from both approaches, any progress in the planning and implementation of health programs *for* Onkwehonwe peoples will need to be guided *by* the expertise of Onkwehonwe professionals, practitioners, elders, and community members in Canada (National Aboriginal Health Organization, 2003), Australia (VicHealth Koori Health Research and Community Development Unit, 2001; Dunbar, 2006) and New Zealand (Health Research Council of New Zealand, 1998). The dialogue that is emerging indicates a clear need for the Onkwehonwe framing of program evaluation, including the development of culturally meaningful conceptual models and participatory processes that engage local partners (LaFrance, 2004).

Although incorporating Onkwehonwe knowledge in health survey research has the potential to enhance cultural relevance, this study uncovered a challenge in "operationalizing" the Onkwehonwe concept of wholistic health. In navigating the research space between Onkwehonwe ways and western ways of constructing knowledge, this study was only able to assess one aspect of Onkwehonwe peoples' understanding of wholistic health. We call this "reductionism." In addition to this, use of the Medicine Wheel has the potential to misrepresent local expressions of identity, which we understand are inherently complex. Take, for example, the perspective shared by the youth coordinator in the textbox which sheds light on the historical background of local identity. This study represents a first step to establishing the potential cultural usefulness of a measure of perceived wholistic health. Findings should be interpreted in light of this challenge and the fact that the study involved a sample of youth that were probably highly motivated (convenience sample). The significance of the reported relationships does warrant future research in larger populations of youth once consideration is given to the challenge of doing this type of research.

To the above discussion we add that the challenge of operationalizing an Onkwehonwe concept may be alleviated to some extent through community-

university partnerships like KSDPP that support the principles of participatory research. In western science, the face and content validity of new measures has usually been established through "expert" review (Streiner, 1991) with the academic considered as the expert. With the shift towards participatory research, community members are identified as one of the key experts (Green, 1995) and it then becomes necessary to include both community members and academics in the process of establishing whether the measure is actually measuring what it is supposed to (face validity) and whether the measure captures the relevant content (content validity). In this study, it was the expertise of community members, especially youth, that gave scale items their meaning and relevance. Incorporating the voice of the community is in line with current ethics' guidelines which encourage a respect for culture, including the integration of local knowledge systems, in Aboriginal health research (National Aboriginal Health Organization, 2003; Castellano, 2004; Schnarch, 2004).

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