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## STUDENT'S CORNER

### A Review of Physical Activity Status in Canadian Indigenous Populations and Current Physical Activity Guidelines and Evaluation Methods

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#### Abstract

Reports on health and physical activity status among Indigenous Canadians have highlighted the need for community-based and Indigenous led primary and secondary prevention programs that address the needs and cultural perspectives of Indigenous people. This student driven paper summarizes the patterns of and barriers to physical activity in Indigenous populations living in Canada and discusses concerns about cultural safety and appropriateness of current physical activity guidelines and methods of physical activity evaluation. Additionally, this paper highlights seven key practices to increase the effectiveness of future initiatives designed to improve physical activity behaviours in Indigenous communities. Future considerations for physical activity assessment and functional fitness testing in Indigenous communities are also discussed. **Health & Fitness Journal of Canada 2018;11(2):113-121.**

*Keywords:* Community, physical activity barriers, assessment, functional fitness testing, wholistic approach.

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#### Introduction

Concerning rates of chronic conditions, such as obesity, cardiovascular disease, hypertension, and diabetes, among Canadian Indigenous populations have highlighted the need for primary and secondary prevention programs in various Indigenous communities (Foulds et al., 2012). Physical activity has shown

promise in promoting health and social connection between members of the family and community (Coble, 2006), and when done in adequate amounts, it can reduce the risk of diseases and provide added health benefits such as improved cholesterol, body composition, blood pressure, bone density, cardiorespiratory and musculoskeletal fitness, and indicators of mental health (Warburton et al., 2006). Thus, initiatives to promote participation in physical activity in Indigenous communities may lead to reduced incidence of chronic disease, and enhanced wholistic wellness (including physical, spiritual, mental, and emotional wellbeing).

This paper reviews the physical activity status among Indigenous populations living in British Columbia, Canada. It discusses the barriers to physical activity, methodological issues with current physical activity assessment tools, cultural relevancy and safety concerns about the Canadian physical activity guidelines, as well as future considerations for physical activity initiatives, evaluation and functional fitness testing in Indigenous communities.

#### Physical Activity Levels in Canadian Indigenous Populations

Previous research has evaluated the health status of British Columbian

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Indigenous populations from various communities around the province and identified 40.9% of First Nations adults as physically inactive (Foulds et al., 2012), which is lower than the 46.4% of First Nations adults on reserve (First Nations Information Governance Centre, 2012) and the 44% of First Nations adults off-reserve across Canada (Gionet and Roshananfshar, 2013). Among First Nation adults, Foulds et al. (2012) identified 55.7% of female participants and 44.4% of male participants as physically inactive, and only 24.3% of female participants and 17.1% of male participants were reported to have met the national physical activity guidelines. No significant differences in physical activity levels were found between age groups. Additionally, among First Nation children and youth, the First Nations Information Governance Centre (2012) reported 49.3% of youth as active and 17.9% of children as inactive.

In their study, Foulds et al. (2012) also found differences in physical activity levels between individuals living on and off reserve and in different geographic regions. More specifically, participants living on reserve, in rural areas, or in the interior region of British Columbia demonstrated an increased likelihood of being physically inactive in comparison to participants living off reserve, in urban areas, or in the Vancouver-Lower Mainland region.

### **Preferred Activities and Barriers to Physical Activity in Indigenous Communities**

Walking is the most frequently reported physical activity among

Indigenous peoples of all ages, followed by gardening, and fishing for adults, and swimming, running, competitive sports, bicycling, and food gathering in children and youth (First Nations Information Governance Centre, 2012). According to Coble (2006), physical activity preferences among Indigenous peoples have increasingly shifted towards sport and lifestyle activities, and away from traditional Indigenous activities (such as powwows and traditional dancing). However, a return to more traditional activities has been widely advocated within Indigenous sharing circles to enhance decolonizing approaches and reconciliation (*unpublished observations* from the Indigenous Studies in Kinesiology program, UBC).

The most commonly reported barriers to physical activity among Indigenous populations include a lack of energy, time, and access to transportation, safety concerns, low socioeconomic status, lack of facilities, equipment and programs, bad weather, and poor infrastructure such as sidewalks (Coble and Rhodes, 2006; Findlay and Kohen, 2007). Other potential barriers include a lack of trained and experienced physical education staff, substance abuse, racism, gender roles, and cost of sport participation (Mason and Koehli, 2012; Thompson et al., 2001). Moreover, an individual's social environment can also act as a barrier or enabler to physical activity, especially for Indigenous women (Thompson et al., 2003). To elaborate, Thompson et al., (2003) found that female participants who knew or saw people who exercised were more likely to be active compared to those who did not know or witness

anyone who exercised. Additionally, if physical activity is not valued or prioritized by the community, individuals were less likely to adopt an active lifestyle (Thompson et al., 2002). These barriers to physical activity among Indigenous peoples suggest that community-based and Indigenous led strategies are warranted, and should address the needs and concerns of families, children, adults, and community leaders (Thompson et al., 2002; Warburton et al., 2008). A one-size-fits-all approach is not advocated.

### **Current Canadian Physical Activity Guidelines and Why These May Not Be Suitable for Indigenous Populations**

Current physical activity guidelines in Canada recommend that for healthy growth and development, infants (aged 1 year or less) should aim to be physically active several times per day, through interactive floor-based play. Meanwhile, toddlers (aged 1-2 years) and preschoolers (aged 3-4 years) should be active for at least 180 minutes spread throughout the day. In addition, it is recommended that toddlers should play in different environments and participate in various activities that help to develop fundamental motor skills (Tremblay et al., 2012).

For health benefits, children (aged 5–11 years) and youth (aged 12–17 years) should be active for at least 60 minutes per day and participate in moderate- to vigorous-intensity activities. Vigorous-intensity and muscle and bone strengthening activities are recommended at least three times per week (Tremblay et al., 2011).

To achieve health benefits and improve functional abilities, adults (aged 18–64 years) and older adults (aged 65 years or

more) should aim to be physically active for at least 150 minutes per week, participating in moderate- to vigorous-intensity aerobic activities and balance enhancing exercises, in bouts of 10 minutes or more. Additionally, muscle and bone strengthening activities that use major muscle groups should be included at least twice a week (Tremblay et al., 2011).

The purpose of the national physical activity guideline is to help Canadians move towards healthier and more active lifestyles (Canada, 2018). However, these guidelines have recently undergone considerable scrutiny. For instance, the statement that an individual “must” achieve a minimal threshold of physical activity to achieve health benefits has been widely criticized as not being evidence-based, potentially increasing the barriers to physical activity participation for Canadians (Warburton and Bredin, 2016; Warburton and Bredin, 2017; Warburton and Bredin, 2018). Recent researchers have also argued that current guidelines may not be suitable, culturally relevant, or culturally safe for Indigenous communities as it only focuses on the physical benefits of physical activity (Brooks-Cleator and Giles, 2016). More specifically, the guidelines do not acknowledge Indigenous peoples’ unique cultural perspective of health and physical activity, which emphasizes “medicine wheel”, a holistic approach to health, wellness and healing by finding balance between the four dimensions of humanity: spiritual, emotional, mental, and physical (Brooks-Cleator and Giles, 2016; Lavallée, 2007). Moreover, the guidelines fail to recognize Indigenous peoples’ view on health, which encompasses not only the person, but also their family, community, and

environment (Levesque, Li, and Bohémier, 2013). A wholistic approach to developing physical activity initiatives is needed to ensure a balance between the many aspects of health and wellness. It is also suggested that to create culturally appropriate physical activity guidelines, Indigenous communities should be included in the process to help guide the development (Brooks-Cleator and Giles, 2016). Unfortunately, remarkably little consultation was held with Indigenous peoples when creating the physical activity guidelines. As such, there was a major lost opportunity to include Indigenous peoples and their ways of understanding and doing.

Current assessments of physical activity in Indigenous peoples may also not be culturally relevant or safe because measurements are based on adaptations of leisure-time physical activity questionnaires designed for non-Indigenous populations (Young and Katzmarzyk, 2007). This may result in inaccurate reflections of physical activity levels among Indigenous communities, because for example, leisure-time and occupation-time are not always clearly separated in Indigenous communities, and participation in organized sports are not always possible (Young and Katzmarzyk, 2007). Furthermore, current physical activity evaluation tools do not necessarily include assessments of culturally-based physical activities or household activities like child care and housework (Young and Katzmarzyk, 2007). Therefore, the development of more culturally appropriate physical activity evaluation tools is warranted.

### **Recommendations for Effective Physical Activity Initiatives**

Physical activity can play a significant role in improving the emotional, mental, physical, and spiritual wellbeing of Indigenous peoples (Lavallée, 2007). Example programs that have generated positive results in promoting and increasing physical activity levels in Indigenous communities include Honour Your Health, Zuni Diabetes Prevention program, and the Kahnawake School Diabetes Prevention Project levels (Foulds et al. 2011; Macaulay et al., 1997; Teufel and Ritenbaugh, 1998; Teufel-Shone et al., 2009). Based on these initiatives, researchers have identified seven key practices that may help to increase the effectiveness of future physical activity initiatives: 1) collaboration between members and leaders and Elders of the Indigenous community, key stakeholders and outside public health professionals in the creation, implementation and evaluation of the program; 2) maintain cultural relevance and integrity of the targeted community; 3) provide learning and training opportunities for community members, school staff and students; 4) enhance connection between members of the community; 5) demonstrate impact; 6) be sustainable; and 7) reshape cultural perceptions of exercise and chronic disease prevention and created a culture of wellness (Teufel-Shone et al., 2009; Warburton et al., 2008).

### **Recommended Physical Activity Evaluation Tools and Fitness Tests**

Most physical activity and fitness testing approaches were designed specifically for the general population, with little consideration of traditional Indigenous activities or ways of

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understanding and doing. However, some researchers have applied assessment tools from the general population to assess the physical activity profile and/or physical fitness (in particular health-related physical fitness) in Indigenous peoples (Foulds et al., 2011; Foulds et al., 2012; Kriska et al. 1990). For instance, the Modifiable Activity Questionnaire (MAQ) is a comprehensive instrument that measures current, past-week, past-year occupational and leisure activities, as well as extreme levels of inactivity as a result of disability (to view the original questionnaire, see Kriska et al., 1990). The tool was designed for easy modification to maximize its feasibility and suitability in a variety of minority populations. For example, activities and items that are specific and comprehensive to a community (i.e., traditional cultural activities) may be added to the questionnaire (Kriska et al., 1990). This adaptability is important as physical activity patterns and the accuracy of self-reported physical activity data may differ amongst cultural groups (Delshad et al., 2015). Therefore, MAQ may be an appropriate physical activity evaluation tool for Indigenous communities.

The Godin-Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ) is another validated physical activity assessment tool developed in the general population (Amireault and Godin, 2015) that has been used within Indigenous communities (Foulds et al., 2011; Foulds et al., 2012) (to view the original questionnaire, see Godin and Shephard, 1985; Godin, 2011). The questionnaire determines participants' physical activity levels based on self-reported leisure-time physical activity over a 7-day period (Godin, 2011). In addition, the GSLTPAQ does not require

participants to provide estimations of time spent being physically active, which reduces the likelihood of measurement error (Altschuler et al., 2009; Amireault and Godin, 2015). Furthermore, the physical activities listed in the questionnaire may be adapted to various populations and communities if the new activities match the appropriate MET categories (Godin, 2011).

Maximal aerobic power ( $VO_{2max}$ ) is a widely accepted measure of the working capacity of the cardiorespiratory and cardiovascular systems. This measure reflects the maximum rate of oxygen transport to exercising muscles, and is influenced by ventilation, cardiac output, vascularization and the ability of muscles to utilize oxygen (Burr et al., 2011; Siconolfi et al., 1985; Warburton et al. 2006). However,  $VO_{2max}$  is a difficult measure to obtain due to the demanding nature of the protocol and the sophisticated instrumentation required, which is not widely accessible (Bohannon et al., 2015). Therefore, various submaximal physical fitness tests have been developed as alternatives to maximal testing.

In working with Indigenous peoples, it is clear that valid and reliable measures of fitness are required that are also time and space efficient. Many studies including Indigenous peoples occur within community settings. Two potentially suitable submaximal oxygen consumption tests that are feasible in various community-based settings are the six-minute walk test (6MWT) and three-minute step test (TMST), both of which have demonstrated reliable and valid results in individuals of all ages (Burr et al., 2011; Bohannon et al., 2015).

The 6MWT measures the total distance a person can walk at a continuous,

hurried pace in 6-minutes. It is an established method for assessing exercise capacity at a submaximal level and is feasible and practical for individuals of all ages, as well as patients with cardiovascular or pulmonary disease (Gibbons et al., 2001; Hamilton and Haennel, 2000; Lammers et al., 2007). Moreover, the 6MWT is simple to perform, brief, and low cost (Bohannon et al., 2015; Lammers et al., 2007). Equations can be used to predict individuals'  $VO_{2max}$  based on their distance walked, height, weight, gender, resting heart rate, and age (Burr et al., 2011). This test has been increasingly used within Indigenous populations to estimate  $VO_{2max}$  and provide a gauge of changes in cardiorespiratory fitness that occur after lifestyle interventions (see work from Indigenous Studies in Kinesiology at the University of British Columbia).

The YMCA TMST protocol requires individuals to step on and off a 12-inch step 24 times per minute for 3-minutes. The strengths of the TMST include its feasibility for healthy individuals across a wide age ranges (19-70 years) and low cost. Furthermore, it is a quick test and is portable, and requires minimum space to be performed (Bohannon et al., 2015; Siconolfi et al., 1985). However, there are some limitations associated with TMST such as the difficult nature of the exercise and thus, it may not be suitable for young children, older adults, individuals who are overweight or obese, and/or patients with cardiopulmonary disease or limitations such as knee pain (Bohannon et al., 2015). To our knowledge, limited studies have used this test within Indigenous communities. As such, further research is required to determine its utility with Indigenous peoples.

### Conclusions

The physical activity status among Canadian Indigenous populations highlight the need for effective initiatives to increase and encourage active lifestyles in Indigenous communities. Current national physical activity guidelines aim to improve physical activity levels and health among the general population of Canadians. However, these generic guidelines fail to address Indigenous peoples' cultural perspectives of health, wellness, and traditional physical activities, and thus, it may not be suitable or appropriate for Indigenous communities. To increase effectiveness of future initiatives, it is recommended that the development of physical activity programs should incorporate Indigenous ways of knowing and doing. Moreover, physical activity and fitness assessments should ideally include those that have been used and validated with Indigenous peoples.

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### Author Qualifications

The authors' qualifications are: Yu-Shan Hsu MKIN; Darren Warburton, MSc, PhD, HFFC-CEP.

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