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Submissions

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Editorial

Welcome readers. We are delighted and grateful to announce that, as of October 1, 2017, the Waakebiness-Bryce Institute for Indigenous Health, Dalla Lana School of Public Health, University of Toronto will be the new publishers of IJIH. And so, this is the last Issue to be published by the Centre for Indigenous Research and Community-Led Engagement at the University of Victoria.

In this Issue, we present five research articles that explore the social determinants of Indigenous peoples’ health in Canada and the United States, including: environment, gender, language, policy, and victimization. As well, we offer an article that discusses the challenges and opportunities of working with large data sets involving Indigenous health. Scott Anderson and colleagues present the findings of their research about how gender and sense of community belonging influence the leisure behaviours of Métis adults in Canada. Alexandra Drawson and colleagues discuss the importance of understanding culture and context when undertaking First Nations health research involving large data sets. Barbara Jenni and colleagues discuss the successes and challenges of a Mentor-Apprentice Program method for adult Indigenous language learning and the impact of participation in these types of programs. Kris Murray and colleagues reveal the perceptions of school staff about the facilitators of and barriers to implementation of a Canadian First Nation school’s healthy nutrition policy. Myra Parker and colleagues examine the relationship between self-reported bias-related victimization and generalized anxiety disorder, depression, and substance abuse among lesbian, gay, bisexual, transgender, and two-spirit American Indians and Alaska Natives. Janis Shandro and colleagues describe the Mount Polley Mine tailings dam breach and its impacts on the health of First Nation community health and environments.

On behalf of the IJIH editorial team, we hope that our readers have enjoyed and been inspired by the diverse and insightful articles we have had the honour to publish. Many thanks to all the authors as well as the Indigenous individuals, communities, and nations engaged in the important work of health and wellness research. It has been an honour and privilege to carry on the work of the National Aboriginal Health Organization (2004–2012); we look forward to future presentation of meaningfully engaged Indigenous health research made possible by the dedicated people at the Waakebiness-Bryce Institute for Indigenous Health.

In health and healing,

Dr. Charlotte Loppie – Editor of IJIH, 2012 – 2017
Ani, Tansi, Kwe kwe, Boozhoo, Aloha, Bonjour, Welcome! The Waakebiness-Bryce Institute for Indigenous Health (WBIIH) is honoured to carry on the work that the National Aboriginal Health Organization and the Centre for Indigenous Research and Community-Led Engagement at the University of Victoria have done with the International Journal of Indigenous Health. As we transition, we invite scholars, researchers, and knowledge holders to become peer reviewers by sending a short introduction letter and C.V. to wbiih.dlsph@utoronto.ca. We will send out more information after our Editorial Advisory Board meets in early October 2017. We hope that you will continue to support the International Journal of Indigenous Health.

Miigwetch (thank you in Ojibwe),

Dr. Angela Mashford-Pringle & Dr. Suzanne Stewart

Co-Editors – IJIH
Community Belonging and Sedentary Behaviour Among Métis Canadians: A Gendered Analysis

Abstract

Study Purpose: Framed by intersectionality theory, this study examined how gender and sense of community belonging interact to influence sedentary behaviour during leisure among Métis adults in Canada. Methods: Data were obtained from 1,169 Métis adults who completed the Canadian Community Health Survey in 2012. Weighted linear regression models examined associations between sedentary behaviour and community belonging stratified by gender, adjusting for confounders. Results: Male gender, younger age, physical activity, and increased socioeconomic status were associated with less sedentary behaviour among Métis adults. Métis men with a very strong sense of community belonging spent 3.6 fewer hours per week engaged in sedentary pursuits during leisure than Métis men who reported a very weak sense of community belonging. Conversely, Métis women with a very strong sense of community belonging spent 1 additional hour per week engaged in sedentary pursuits during leisure than Métis women who reported a very weak sense of community belonging. These associations remained significant after adjustment for sociodemographic covariates and perceived mental health and overall health, suggesting other factors were influencing these differences. Conclusions: A strong sense of community belonging among Métis men may reduce sedentary behaviour during leisure by as much as 30 minutes per day, which may be clinically significant. Increased community belonging among Métis women was associated with increased sedentary behaviour. These findings suggest that interactions between community belonging and gender should be considered when developing interventions to reduce leisure sedentary behaviour among Métis adults in Canada.

Keywords: Métis, sedentary behaviour, community belonging, gender, social determinants of health, socio-ecological, intersectionality theory

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Introduction

Sedentary behaviour is defined as any waking activity with an energy expenditure of 1.5 metabolic equivalents (METS) or less while in a sitting or reclining posture (Sedentary Behaviour Research Network, 2012). Prolonged and excessive sedentary behaviour has deleterious effects on health and has been associated with cardiovascular disease, diabetes, obesity, and all-cause mortality (Proper, Singh, van Mechelen, & Chinapaw, 2011; Thorp, Owen, Neuhaus, & Dunstan, 2011). Sedentary behaviour is ubiquitous; the average Canadian accumulates 9.5 hours of sedentary time per day (69% of waking hours) (Colley, Garriguet, Janssen, Craig, & Clarke, 2011). While sitting is pervasive it is also modifiable, particularly during leisure hours when individuals have more choice over the activities they engage in. Thus, understanding the determinants of sedentary behaviour during leisure is important for designing effective interventions.

An ecologic model of sedentary behaviour acknowledges multiple levels of influence on sedentary activity, including individual, interpersonal, and environmental factors (Owen et al., 2011). A systematic review of research published between 2000 and 2015 highlighted several variables associated with sedentary behaviour during leisure. At the individual level, sedentary adults tended to be older, be female, have a higher body mass index, smoke, and not engage in regular physical activity (O’Donoghue et al., 2016). Results were inconsistent for interpersonal and environmental variables, highlighting the need for additional research (O’Donoghue et al., 2016). A study we published in 2016 found sense of community belonging is an interpersonal variable associated with reduced sedentary behaviour among adults (Anderson, Currie, & Copeland, 2016). A second study found community belonging interacts with household income to influence sedentary behaviour among First Nations adults in Canada (Anderson, Currie, Copeland, & Metz, 2016). Correlates of sedentary behaviour among Métis and Inuit Canadians remain unknown.

Sedentary Behaviour Among Métis Canadians

This study used national data collected for the Canadian Community Health Survey (CCHS) in 2012 about three main Indigenous groups in Canada—First Nations, Métis, and Inuit—to examine correlates of sedentary behaviour among Métis adults (Statistics Canada, 2012). Although more than 450,000 Canadians identify as Métis, representing nearly a third of all Indigenous people in Canada, there is a lack of research focused specifically on Métis health and health behaviour (Kumar, Wesche, & McGuire, 2012; Statistics Canada, 2013). The Métis are named as one of the Indigenous Peoples of Canada under section 35 of the Constitution Act, 1982. Currently, the term Métis is used broadly to describe individuals with mixed First Nations and European ancestry who identify as Métis (International Journal of Indigenous Health, n.d.). Métis organizations in Canada have differing criteria about who qualifies as Métis. The Métis National Council (2011) has adopted the following definition: “Métis means a person who self-identifies as Métis, is distinct from other Aboriginal peoples, is of historic Métis Nation ancestry and who is accepted by the Métis Nation” (p. 2). In this study, a Métis participant was defined as a person who self-identifies as Métis.
Between 1996 and 2006, the Métis population increased by 91%, suggesting many Canadians are reclaiming their Métis heritage (Statistics Canada, 2009). Sense of community belonging is an important part of this reclamation process, as well as an important correlate of health behaviour. In this study, we examined associations between sense of belonging and sedentary behaviour separately for Métis men and women, given that a recent review of knowledge gaps in Métis research identified the need for health studies providing information specific to Métis men (Kumar et al., 2012). A gender-stratified analysis also fits with the tenets of intersectionality theory, which suggests Métis identity, gender, and sense of belonging may interact to influence health behaviour in a non-additive way (Bauer, 2014). Given little has been published about sedentary behaviour among Métis adults, we also examined sociodemographic and behavioural correlates of sedentary behaviour within this population.

Methods

Study Design

Data were obtained from the 2012 CCHS (Statistics Canada, 2012). The CCHS is an annual nationwide survey conducted by Statistics Canada. This cross-sectional survey collects health information from Canadians ages 12 years or older. Those living in institutions, military bases, Indigenous communities, and Métis settlements were excluded from the survey. Thus, the present findings may not be generalizable for Métis adults living in these locations.

Procedure

Data were collected using computer-assisted interviewing, both in person and by phone, between January 1 and December 31, 2012. The 2012 CCHS used a multistage stratified cluster design to ensure samples collected were generalizable to the wider population. This design has been described in detail elsewhere (Statistics Canada, 2012). At a national level, the overall response rate was 68.4% (N = 61,707) among participants ages 12 years and older (Statistics Canada, 2012). This study included only those participants who were aged 18 years and older and self-identified as Métis. There were 1,169 individuals who met these criteria and provided valid responses on the outcome of interest (sedentary behaviour during leisure). This study was exempt from institutional ethics board review at the University of Lethbridge, as data were obtained in de-identified form.
**Measures**

**Sedentary behaviour.** As part of the CCHS, respondents were asked to report average weekly leisure time (outside of school or work) spent in the following sedentary activities: (a) using a computer, including playing computer games and using the Internet; (b) playing video games such as Xbox, Nintendo, and PlayStation; (c) watching television or videos; and (d) reading. Statistics Canada (2012) calculated total leisure sedentary behaviour time and provided the data in 10 categories beginning at < 5 hours per week and increasing by increments of 5 hours to ≥ 45 hours per week. This variable was used in the present analysis.

**Sense of community belonging.** Sense of community belonging was examined by asking “How would you describe your sense of belonging to your local community?” on a scale of 1 to 4 (1 = very strong, 2 = somewhat strong, 3 = somewhat weak, and 4 = very weak). Although a longer instrument is available, this single question is frequently used to measure this construct (Carpiano & Hystad, 2011; Hagerty & Patusky, 1995; Shields, 2008).

**Sociodemographic variables.** Data were collected on gender, age, education (less than secondary school graduate, secondary school graduate, and postsecondary graduate), household income (five categories in total, ranging from $0 to ≥ $80,000), marital status (married/common-law, widowed/divorced/separated, or single/never married), and employment status (currently employed: yes or no).

**Behavioural variables.** Data were collected on physical activity using a derived variable of energy expenditure values of kcal/kg/day that was created by Statistics Canada. Individuals were categorized into three groups: 1 = active (> 3 kcal/kg/day), 2 = moderately active (1.5–3 kcal/kg/day), or 3 = inactive (< 1.5 kcal/kg/day). Smoking was examined by asking respondents if they smoked cigarettes: 1 = daily, 2 = occasionally, or 3 = not at all. Alcohol use was derived by calculating number of drinks reported per month, with participants stratified into three groups: 1 = regular drinkers (alcohol consumed at least once per month), 2 = occasional drinkers (alcohol consumed less than once per month), and 3 = no use (did not drink in the last 12 months).

**Statistical Analysis**

The amount of time spent watching television, using computers, playing video games, and reading during leisure were calculated and an overall estimate was created. Data were weighted to represent the general household population of Métis adults living outside of Indigenous communities in Canada; the creation of this weighting variable is described in detail elsewhere (Statistics Canada, 2012).

**Regression modelling.** Four sets of linear regression models were used to examine associations between exposure variables—namely, community belonging, smoking, alcohol consumption, and physical activity—and sedentary behaviour with 95% confidence intervals. Associations between each exposure variable and sedentary behaviour were first adjusted for...
age, followed by other sociodemographic confounders selected a priori based on existing literature (marital status, income, education, and employment; Anderson, Currie, Copeland, & Metz, 2016; Clark et al., 2010; Shields & Tremblay, 2008). A third model included additional control for overall self-perceived health and mental health, as health can confound associations between the exposure variables we examined and sedentary behaviour. Unstandardized beta coefficients in these models represent the change in time spent in sedentary behaviour per week in relation to each exposure variable. The outcome variable, sedentary behaviour during leisure, is made up of 10 incremental categories. A 1-point increase in this category represents a 5-hour (300-minute) decrease in sedentary behaviour per week. Thus, an unstandardized beta coefficient of 1.0 and 0.25 represent a 5-hour and 1.25-hour decrease in sedentary behaviour per week for every 1-point change in the independent variable, respectively. To examine the ways in which gender and sense of belonging may interact to influence sedentary behaviour, we stratified the sample by gender and examined associations between community belonging and sedentary behaviour for each gender group.

Data were examined for multivariate outliers before conducting the analysis; none were found. Multicollinearity between variables was examined using variance inflation factors (VIFs) before main effect models were derived. All VIFs were below 5. All confounders were examined for effect modification prior to entry into main effects models using lowess curves; none were found. All analyses were completed in 2014 and run using SPSS version 22.0.

Results

Sample Description

Characteristics of the sample are outlined in Table 1. The sample \((N = 1,169)\) was 47.5% male. The most common age range was 35–44 years. Most participants were married and employed, and had completed a postsecondary degree. Almost two thirds of the sample had household incomes that fell below the national average of $80,000/year.

Prevalence of Sedentary Behaviour

Métis adults were sedentary 25–29 hours/week during leisure (median category; range = 0 to ≥ 45 hours/week). Watching television/videos was the most frequent sedentary behaviour (11–14 hours/week), followed by using a computer (3–5 hours/week), reading (3–5 hours/week), and playing video games (< 1 hour/week).
Table 1
Demographic Characteristics of Sample

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N = 1,169a</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>47.5%</td>
</tr>
<tr>
<td>Women</td>
<td>52.5%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>20.0%</td>
</tr>
<tr>
<td>25–34</td>
<td>20.6%</td>
</tr>
<tr>
<td>35–44</td>
<td>21.0%</td>
</tr>
<tr>
<td>45–54</td>
<td>17.1%</td>
</tr>
<tr>
<td>55–64</td>
<td>12.9%</td>
</tr>
<tr>
<td>≥ 65</td>
<td>8.4%</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
</tr>
<tr>
<td>Married/common-law</td>
<td>58.0%</td>
</tr>
<tr>
<td>Widowed/divorced/separated</td>
<td>9.0%</td>
</tr>
<tr>
<td>Single</td>
<td>32.9%</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>Less than secondary graduate</td>
<td>8.7%</td>
</tr>
<tr>
<td>Secondary graduate</td>
<td>19.1%</td>
</tr>
<tr>
<td>Postsecondary graduate</td>
<td>72.2%</td>
</tr>
<tr>
<td><strong>Household Income</strong></td>
<td></td>
</tr>
<tr>
<td>$0–$19,999</td>
<td>13.1%</td>
</tr>
<tr>
<td>$20,000–$39,999</td>
<td>16.0%</td>
</tr>
<tr>
<td>$40,000–$59,999</td>
<td>22.4%</td>
</tr>
<tr>
<td>$60,000–$79,999</td>
<td>12.1%</td>
</tr>
<tr>
<td>≥ $80,000</td>
<td>36.4%</td>
</tr>
<tr>
<td><strong>Employed</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59.4%</td>
</tr>
<tr>
<td>No</td>
<td>40.6%</td>
</tr>
</tbody>
</table>

a Percentages are based on unweighted data.

Correlates of Sedentary Behaviour
Younger age was associated with decreased sedentary behaviour during leisure. After adjustment for sociodemographic confounders, every 1-year reduction in age was associated with a reduction of 3 minutes of sedentary behaviour per week (Table 2, Adjusted Model 2, unstandardized beta coefficient = 0.01 x 300 min given a 1-point increase in this category represents a 5-hour (300-minute) decrease in sedentary behaviour per week). Thus, a Métis adult aged 55 years spent 1.75 more hours per week in leisure sedentary behaviour than a Métis adult aged 20 years ([55 – 20 = 35 years] x 3 minutes = 105 additional minutes per week ÷ 60). Métis
women spent half an hour more per week in sedentary activities than Métis men (Table 2, Adjusted Model 2, unstandardized beta coefficient = 0.11 × 300 min = 33 minutes less per week for Métis men).

Increased household income, being employed, and being married were all associated with less sedentary behaviour during leisure. Among behavioural correlates, being physically active was strongly associated with less sedentary behaviour. This association was further strengthened by adjustment for sociodemographic confounders. Additional control for perceived health did not influence the size of this effect. Being a non-smoker and consuming alcohol were each associated with less sedentary behaviour during leisure; however, the size of these correlations was very small.

### Table 2

**Correlates of Sedentary Behaviour: Multiple Regression Models With 95% Confidence Intervals (CIs)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Adjusted Model 1&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Adjusted Model 2&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Adjusted Model 3&lt;sup&gt;d&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B [95% CI]&lt;sup&gt;e&lt;/sup&gt;</td>
<td>SE</td>
<td>β&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
<tr>
<td>Community belonging</td>
<td>0.20 [0.19, 0.21]</td>
<td>0.005</td>
<td>0.06</td>
</tr>
<tr>
<td>Alcohol used</td>
<td>0.22 [0.21, 0.23]</td>
<td>0.006</td>
<td>0.06</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>−0.04 [−0.05, −0.03]</td>
<td>0.005</td>
<td>0.01</td>
</tr>
<tr>
<td>Physically active</td>
<td>0.27 [0.26, 0.28]</td>
<td>0.005</td>
<td>0.09</td>
</tr>
<tr>
<td>Male gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Younger age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not currently married</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased education</td>
<td>0.18 [0.17, 0.20]</td>
<td>0.008</td>
<td>0.04</td>
</tr>
<tr>
<td>Increased income</td>
<td>0.10 [0.09, 0.10]</td>
<td>0.001</td>
<td>−0.13</td>
</tr>
<tr>
<td>Employed</td>
<td>0.72 [0.70, 0.73]</td>
<td>0.009</td>
<td>0.13</td>
</tr>
</tbody>
</table>
Community Belonging and Gender

As shown in Table 2, before stratification by gender, there was a weak association between sense of community belonging and sedentary behaviour. This changed when the association was examined separately for men and women. Among Métis men, a strong sense of community belonging was associated with less sedentary behaviour. In a fully adjusted model, every 1-point increase in community belonging from the lowest possible response (very weak sense of belonging) resulted in a 1.2 hour decrease in sedentary behaviour among Métis men per week (Table 3, Model 3, unstandardized beta coefficient = 0.24 or 72 minutes x 300 min given a 1-point increase in this category represents a 5-hour (300-minute) decrease in sedentary behaviour per week). As this was a 4-point scale, results indicate that Métis men with a very strong sense of community belonging spent 3.6 fewer hours per week in sedentary behaviour during leisure than Métis men who reported a very weak sense of community belonging.

The opposite was found among Métis women, for whom every 1-point increase in community belonging resulted in a 21-minute increase in sedentary behaviour per week in a fully adjusted model (Table 3, Model 3, unstandardized beta coefficient = –0.07). Thus, Métis women with a very strong sense of community belonging spent approximately 1 additional hour (63 minutes) in sedentary behaviour during leisure each week than Métis women who reported a very weak sense of community belonging.

Table 3
Association Between Sense of Community Belonging and Sedentary Behaviour Stratified by Gender: Multiple Regression With 95% Confidence Intervals (CIs)\(^a\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Adjusted Model 1(^b)</th>
<th>Adjusted Model 2(^c)</th>
<th>Adjusted Model 3(^d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B [95% CI]</td>
<td>SE</td>
<td>β(^f)</td>
</tr>
<tr>
<td>Men</td>
<td>0.54 [0.52, 0.55]</td>
<td>0.007</td>
<td>0.16</td>
</tr>
<tr>
<td>Women</td>
<td>–0.07 [–0.09, –0.06]</td>
<td>0.007</td>
<td>–0.02</td>
</tr>
</tbody>
</table>

\(^a\) Higher beta values in this table correspond to decreased sedentary behaviour during leisure. \(^b\) Model 1 is adjusted for age. \(^c\) Model 2 is adjusted for age, marital status, education, household income, and employment status. \(^d\) Model 3 is adjusted for age, marital status, education, household income, employment status, and overall mental and physical health. \(^e\) Unstandardized beta coefficient. \(^f\) Standardized beta coefficient.
Discussion

Métis adults reported engaging in 25–29 hours of sedentary behaviour during leisure per week. This is comparable to First Nations adults living outside Indigenous communities, but slightly higher than the general population average of 20-24 hours of sedentary behaviour during leisure in Canada (Anderson, Currie, & Copeland, 2016). Métis men were less sedentary during leisure than Métis women, which is consistent with research in non-Indigenous populations showing men are generally less sedentary during leisure than women, with some exceptions (O’Donoghue et al., 2016). For example, research has shown that First Nations women are less sedentary during leisure than First Nations men (Anderson, Currie, Copeland, & Metz, 2016).

Community Belonging and Sedentary Behaviour

In keeping with the tenets of intersectionality theory (Bauer, 2014), we found gender and sense of community belonging were social identities that interacted to influence sedentary behaviour among Métis adults. Métis men with a very strong sense of community belonging spent 3.6 fewer hours per week engaged in sedentary pursuits during leisure than Métis men who reported a very weak sense of community belonging. It is difficult to comment on the clinical significance of this finding as there is limited prospective data and no experimental data to clearly demonstrate the health effects of changing the volume of sedentary time accumulated. However, from various cross-sectional datasets and using statistical techniques such as isotemporal substitution, we can estimate the potential effects of reducing sedentary time by 3.6 hours per week or approximately 30 minutes per day. Buman et al. (2014) used isotemporal substitution to show that replacing 30 minutes of sedentary time with 30 minutes of sleep per day was associated with a 2.4% reduction in insulin. That study also found that replacing 30 minutes of sedentary time with physical activity was associated with an 11% reduction in insulin and a 2.4% reduction in waist circumference. Thus, while it may depend on what other behaviours are occurring in the place of sedentary activity, a difference as little as 30 minutes per day could, in theory, be associated with reduced health risk.

In contrast, we found that Métis women with a very strong sense of community belonging spent approximately 1 additional hour per week (or 9 additional minutes per day) engaged in sedentary pursuits during leisure than Métis women who reported a very weak sense of community belonging. This association, although small, was unexpected. Regression models were adjusted for sociodemographic factors, mental health, and overall health, suggesting unique pathways beyond income, age, and health may be influencing these associations. These results highlight the need for qualitative studies to gain a more nuanced understanding of gender-based differences in sedentary behaviour among Métis adults, and more gender-stratified quantitative analyses to better understand the impacts of intersecting social identities on health behaviour among Métis women and men.

Behavioural Correlates of Sedentary Behaviour

Increased physical activity was associated with lower sedentary behaviour among Métis adults generally, which is consistent with findings in non-Indigenous populations (Anderson,
Currie, & Copeland, 2016; Anderson, Currie, Copeland, & Metz, 2016; Hu et al., 2001; Jakes et al., 2003). Control for sociodemographic confounders strengthened this association, indicating negative confounding was present. This suggests that unadjusted models underestimated the magnitude of the inverse association between physical activity and sedentary behaviour, at least among Métis adults. Additional control for perceived health did not diminish the strength of this association, indicating that better mental health or overall health does not explain why some Métis adults are choosing to spend time engaged in physical activity rather than sedentary pursuits during leisure.

Being a non-smoker and using alcohol regularly were both weakly associated with less sedentary behaviour during leisure after adjustment for confounders, which repeats findings documented among First Nations adults (Anderson, Currie, Copeland, & Metz, 2016). A systematic review suggests associations between smoking, alcohol use, and sedentary behaviour during leisure are mixed in populations generally (Rhodes, Mark, & Temmel, 2012). The size of these associations suggests these variables contribute little to our understanding of sedentary behaviour among Métis adults and may not be the best focus for future research in this area.

Limitations

These results are limited by the use of a cross-sectional design, which precludes inferences of causation and temporal sequence. Recall bias may be present given that self-report measures were used. The sedentary behaviours examined were not exhaustive, neglecting transport and occupational sedentary behaviour. Reporting of community belonging was obtained using one question; longer instruments are available to examine this construct (Hagerty & Patusky, 1995). Residual confounding may be a concern as factors not measured in this study may have influenced the results. The strengths of this study include the use of a large representative sample of Métis adults living outside Métis settlements in Canada, gender-stratification, and control for the effects of important confounders.

Conclusion

A strong sense of community belonging among Métis men may reduce sedentary behaviour during leisure by as much as 30 minutes per day, which may be clinically significant. An unexpected finding in this study was that community belonging was not associated with less sedentary behaviour among Métis women. These findings suggest that interactions between community belonging and gender should be considered when developing interventions to reduce leisure sedentary behaviour among Métis adults in Canada.

References


First Nations Community Well-Being Research and Large Data Sets: A Respectful Caution

Abstract
Health researchers are increasingly encouraged to use large, community-level data sets to examine factors that promote or diminish health, including social determinants. First Nations people in Canada experience disparity in a range of social determinants of health that result in relatively low community well-being scores, when compared to non-First Nations people. However, First Nations people also possess unique protective factors that enhance well-being, such as traditional language usage. Large data sets offer First Nations a new avenue for advocating for supports and services to decrease health inequity while developing culture-based evidence. However, care must be taken to ensure that these data are interpreted appropriately. In this paper, we respectfully offer a cautionary note on the importance of understanding culture and context when conducting First Nations health research with large data sets. We have framed this caution through a narrative presentation of a simple and concrete example. We then outline some approaches to research that can ensure appropriate development of research questions and interpretation of research findings.

Keywords
Language, large data sets, social determinants of health, well-being, First Nations

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Introduction
An understanding of population health is essential in effectively implementing interventions aimed at improving well-being, and it begins with accurate and complete health information (Smylie, 2010). Large data sets that include a variety of community-wide measures of biological health status and access to health services are typically utilized in developing this
understanding. Access to accurate data and appropriate analyses are crucial as recommendations stemming from these data and analyses have the potential to be implemented within communities. Unfortunately, high-quality data and appropriate analyses regarding the health and well-being of First Nations people in Canada are scarce (National Collaborating Centre for Aboriginal Health, 2013; Smylie, 2010). This may result in decision makers and governments making changes to existing policy or implementing new policy regarding the health of Canadians with less than optimal information.

Given the growing discussion around using large data sets for research in Indigenous communities, we provide a cautionary demonstration that aims to analyze publicly available data regarding social determinants of community well-being for First Nations in Canada without the appropriate apparatus of best practice approaches to Indigenous health research. Our purpose is to respectfully show that researchers must use caution when interpreting relationships in these data. Specifically, given that traditional language has been conceptualized as being related to increased well-being, we chose the relationship between traditional language use and community well-being as a demonstration. Although we illustrate this caution with a specific example, the purpose of this paper is to encourage academic and non-academic researchers to consider context when utilizing large data sets for research with First Nations Peoples. This necessity of context has been noted in relation to both individual- and community-level data. King (2015) emphasized the requirement of focus groups or discussion circles to provide frame of reference for the findings from a study by Ryan, Cooke, Leatherdale, Kirkpatrick, and Wilk (2015) that traditional language use is related to smoking. Walls, Whitbeck, and Armenta (2016) actually carried out the recommendation touted by King (2015) and this paper and demonstrated that the relationships between Aboriginal spirituality and poorer psychological outcomes were reduced once perceived discrimination and historical losses were accounted for statistically. Unfortunately, this small sample of papers represents the minority, and many researchers are still presenting potentially harmful findings regarding Indigenous Peoples by overlooking the importance of context in large data set analysis.

Large Data Sets

First Nations Profiles (AANDC, 2006b). The federal government department Indigenous and Northern Affairs Canada (INAC; formerly Aboriginal Affairs and Northern Development Canada [AANDC] and before that, Indian Affairs and Northern Development) offers a potentially useful data source for First Nations communities on social determinants of health. INAC creates community profiles based upon community-level data from various subdivisions within INAC, and includes information regarding governance structures, federal funding utilization, geography, population statistics, income and employment, language, education, and mobility for the majority of First Nations communities within Canada (AANDC, 2006b). While some sectors of these First Nations Profiles are updated on a more regular basis, Statistics Canada collects data every 5 years. However, the variables collected by Statistics
Canada represent what might be described as independent variables,¹ which are of less utility unless dependent variables² can be identified.

The Community Well-Being Index (AANDC, 2006a). To better understand the discrepancy in well-being between Canadian urban communities and rural First Nations communities, INAC has developed the Community Well-Being (CWB) Index. The creators of the index also aimed to expand high-quality, cost-effective research on the social determinants of health for First Nations communities (McHardy & O’Sullivan, 2004). However, there has been relatively little use of the CWB Index as a research tool. This index is a quantitative measure of First Nations communities’ social and economic well-being, and provides a tool to determine whether well-being is improving, declining, or remaining stable. Using Statistics Canada’s census data regarding population, the CWB Index uses four main community indicators to calculate a score: income,³ education,⁴ housing,⁵ and labour force.⁶ These scores range from 0 to 1, with higher scores representing more positive community well-being. Both the census data and CWB Index are revised every 5 years. Categorizing these social determinants helps to clarify which community indicators are problematic among First Nations communities, where improvements are necessary, and in which domain communities experience the most difficulty. The CWB Index represents a potential dependent variable for some large data set analyses.

Language

Many First Nations people identify the ability to speak their language as an important social determinant of health. Language is often the vehicle by which knowledge is translated, including cultural traditions and values (National Collaborating Centre for Aboriginal Health, 2013). In addition, languages are necessary to ensure knowledge is exchanged through generations, particularly for cultures that value oral traditions (Battiste, 1998). Shared language is also essential for a shared worldview—affecting overall belief systems and identity development (Battiste, 1998; Hallett, Chandler, & Lalonde, 2007).

One tragic result of colonialism and, specifically, the residential school era in Canada is the disruption of entire generations of traditional-language speakers. For instance, over 60% of adults having attended residential school report the loss of their traditional language as a direct consequence (First Nations Information Governance Centre [FNIGC], 2012; Milloy, 1999). This disruption has left many communities with fewer traditional language speakers, especially in

¹ An independent variable is a variable that represents the cause of an outcome, which is independent of that outcome.
² A dependent variable is a variable that represents the outcome of a specific cause.
³ The CWB income factor is income per capita, transformed via a logarithmic function to account for dependent individuals and those with no income (McHardy & O’Sullivan, 2004).
⁴ The CWB education factor includes the proportion of the population with at least a Grade 9 education and the proportion that has obtained a high-school diploma or higher level of education (McHardy & O’Sullivan, 2004).
⁵ The CWB housing factor refers to both the quantity and the quality of houses available (McHardy & O’Sullivan, 2004).
⁶ The CWB labour force factor considers both the participation in the labour force and also the percentage of those aged 15 or above who are employed (McHardy & O’Sullivan, 2004).
smaller communities. For example, according to the most recent First Nations Regional Health Survey (RHS), 36.2% of First Nations people reported that they use a First Nations language most often in their day-to-day life. However, in communities of less than 300 individuals, only 15.5% use their traditional language most often (FNIGC, 2012). Another consequence of fewer traditional-language speakers in the communities is the effect on younger generations. For instance, 83.8% of adults aged 60+ who reside in a First Nations community report understanding or speaking a First Nations language; only 59.4% of those aged 18–29 understand or speak their language (FNIGC, 2012).

Not only is language essential for maintaining traditions and oral history, but it is also an important factor that contributes to the well-being of First Nations people. Hallett et al. (2007) showed that traditional language use among community members was related to lower incidence of youth suicide. Specifically, they found that First Nations communities in British Columbia with greater than 50% of their population speaking a traditional language had lower youth suicide rates when compared to the provincial average for First Nations youth. In communities in which fewer than half of the population spoke their traditional language, youth suicide rates were much higher (Hallett et al., 2007). Results from RHS also indicated that traditional language may have a protective effect against suicidality. For instance, First Nations adults with an intermediate understanding or fluency of their traditional language reported lower rates of suicidal thoughts (18.1%) and suicide attempts (11.5%) compared to those with only a basic understanding of their traditional language (25.8% for suicidal thoughts and 16.0% for suicide attempts; FNIGC, 2012). The importance of traditional language within Aboriginal communities is also echoed in the recently released Truth and Reconciliation Commission of Canada’s (2015) Calls to Action, which include recommendations for revitalizing and maintaining traditional languages through relevant programming.

Methods

Data

Once again, this example is being utilized to illustrate the widespread issue of lack of context and potential misinterpretation of analyses from large data sets. Using information publicly available on the Statistics Canada and INAC websites, we created a database that included information on population size, median age, and proportion of traditional language speakers, as well as the respective CWB indices in each community. To ensure accuracy, all data were entered by one researcher and then reviewed by another. We randomly selected 10% of the resulting data to inspect further for errors and found that the error rate was negligible.

In total, 370 of the 617 First Nations communities in Canada were included in our analyses, as only these communities received CWB scores and reported all other variables of interest. The average population in these communities was 764.97 (SD = 900.57), with an average age of 26.68 (SD = 7.71) and CWB score of 57 (SD = 9.92). CWB scores from 2006
were chosen in an attempt to match the year of Statistics Canada and INAC data so that all data were representative of the same point in time.

Results

Analyses

Hierarchical regressions were computed between Aboriginal language knowledge (represented by the percentage of the population speaking a traditional language) and 2006 CWB score (AANDC, 2006a). Total population of the community and median age were controlled for in steps 1 and 2 of the hierarchical regression. Results indicated that knowledge of traditional language predicted a reduced CWB score, $\Delta F(3, 379) = 124.046, p = .00$. That is, in these data, communities with a greater proportion of language speakers had overall a lower CWB score. However, this is not the complete story and terminating analyses here would be extremely problematic. This initial result contradicts other quantitative evidence and culture-based evidence that speaking a traditional language enhances well-being for First Nations individuals (e.g., Hallett et al., 2007). As Indigenous mental health is the primary area of research of our team, we understand the positive influence that speaking a traditional language has on community and individual well-being and realized that the relationship was likely influenced by other variables.

To consider other factors that could be contributing to this incongruent finding, we returned to the data and began examining it for variables related to important social determinants of health. The INAC First Nations community profiles included a variable called “Geographic Zone,” which provides a score of 1 to 4. This score represents how removed each community is from the nearest service centre (i.e., major city). Zone 1 includes communities no farther than 50 km from the nearest city, while Zone 4 indicates that a community does not have year-round road access to the nearest city. We carried out a bivariate correlation and found that an increase in Aboriginal language speakers in a community was related to remoteness ($r = -.537, p \leq .000$). Subsequently, we conducted our hierarchical regression analysis again, this time controlling for remoteness in addition to total population and median age. The relationship between traditional language speakers and CWB Index was non-significant, $\Delta F(1, 365) = .305, p = .581$, showing that remoteness was accounting for the majority of the variance explaining the relationship between knowledge of traditional language and CWB Index. We do acknowledge that this example is a simplified analysis of complex data for the purposes of highlighting important conceptual issues in culturally and contextually appropriate research with large data sets.

Discussion

This study highlighted an important issue in the interpretation of large data sets, which may be particularly relevant when the researcher is removed from communities and unfamiliar with the context in which the data were gathered. We showed that without thoughtful interpretation, traditional language—a variable that is an indicator of a successful, thriving community—emerged as a predictor of decreased community well-being in our initial analyses.
However, we also knew that this relationship was likely confounded by other factors, specifically by communities’ remoteness. Generally, communities that were more remote (i.e., farther from the nearest major city) had a greater number of traditional language speakers, yet remoteness and associated isolation bring additional challenges (e.g., limited access to services, affordable food, adequate housing, and employment opportunities) that can negatively influence community well-being.

In addition to these challenges, there are issues with the nomenclature used by the CWB Index. In this index, well-being is composed of four elements: income, education, housing, and employment, which roughly constitute socioeconomic status. However, the construct of well-being, particularly for Indigenous Peoples, is often much more holistic and incorporates connection with culture, nature, and the spiritual world (Canadian Institute for Health Information, 2009). Therefore, a community with a low score on the CWB Index is likely impoverished, but community members may still report high levels of well-being due to cultural connection.

Results of this study provide a concrete example and cautionary note for researchers interested in exploring large-scale community-level data. Had we simply stopped our exploration at the initial finding and pursued publication of these data in a peer-reviewed journal, the results could have been disastrous. Decision makers are moving toward more frequent utilization of findings from academic research to justify funding decisions and as a rationale for supporting the implementation or termination of projects and initiatives. The initial finding from this study may have been used to support the elimination of funding for cultural programming or culture-based approaches to healing, further disrupting the ability of communities to support their traditional languages, practices, and culture-based approaches to well-being. Problematic interpretation could have implications for funding or program planning, for example; however, we have not identified an example of this in the peer-reviewed literature.

**Recommendations for Research Approaches**

Researchers using large-scale data sets must adopt additional safeguards to ensure that their conclusions are accurate and valid and, above all, cause no harm. A history of colonization and assimilation has resulted in a unique context that cannot be understood solely with Western, and primarily quantitative, research approaches. Although many Aboriginal communities experience similar social determinants of health, context dictates what influence these determinants have in individual communities (Reading & Wien, 2009). Fortunately, there are a number of helpful approaches researchers can use in partnership and collaboration with communities to ensure that they are conducting research in an appropriate manner. Mixed quantitative-qualitative designs are beneficial in allowing communities to provide the context for the researcher to situate their findings (Wendt & Gone, 2012) and offer an option for research questions that require both the standardization of a quantitative approach, but also the additional interpretative benefits of a qualitative design (Bartholomew & Brown, 2012). A researcher can collect numerical information and analyze this information according to Western methods, but then utilize qualitative data in interpretation to ensure that the quantitative data are
contextualized. This approach can lead to both credible, generalizable findings and accurate measurement of phenomena, all viewed from the appropriate cultural and contextual lenses (Tashakkori & Creswell, 2007).

Two-Eyed Seeing is another research method that can assist researchers working with large-scale data sets. With this approach, researchers aim to “see from one eye with the strengths of Indigenous ways of knowing, and to see from the other eye with the strengths of Western ways of knowing, and to use both of these eyes together” (Bartlett, Marshall, & Marshall, 2012, p. 335). A Two-Eyed Seeing approach, ideally utilizing both quantitative and qualitative methods, within a community-based participatory research (CBPR) framework represents a research strategy that considers best practices in both Indigenous and Western settings and can account for the complex relationships between variables of interest and the unique contexts of Aboriginal communities in Canada. This approach assists in negating the power differential inherent in Western and Indigenous ways of knowing, at least from the point of view of the academy, where standardized, quantitative data are valued over all other forms (Hall et al., 2015). Two-Eyed Seeing allows researchers to see the value in Indigenous methods and can also provide context for narrow, quantitative data, as Indigenous methods often emphasize the wider relationships between relevant variables and community (Hall et al., 2015).

Researchers utilizing data from Aboriginal communities, both small- and large-scale, should strive to have the benefits of their research go beyond the dissemination of knowledge to the academic community, which has access to conferences and journal subscriptions. Research can be viewed as a source of healing in Aboriginal communities, and contemporary investigators should collaborate with communities to ensure their research meets the needs of the individuals within the community and the community as a whole and also works to undo the colonial-style research projects of the past that affected many communities negatively (Hall et al., 2015).

Western researchers customarily took a “helicopter” approach to research in Indigenous communities in which they would arrive, take data in whatever form they required, and then leave and never return to share the results of their project (Ferreira & Gendron, 2011). Applying a CBPR design ensures that communities are involved in all steps of the research project, from conception through to dissemination of results, and that community members have the opportunity to refine the research question to ensure that the work benefits the community.

CBPR can provide a framework within which a researcher can utilize Two-Eyed Seeing and/or a mixed-methods approach. CBPR is also likely to reduce the risk of a researcher overlooking the complexity of the relationships inherent in Aboriginal communities. This framework not only considers who is involved (i.e., the sample), but also requires researchers to carefully reflect on how these individuals and communities are involved in each step of the project, from data collection through to knowledge translation and dissemination (Castleden, Morgan, & Lamb, 2012). The three main Canadian federal funding agencies have devoted an entire chapter of their Tri-Council Policy Statement (TCPS2): Ethical Conduct for Research Involving Humans (CIHR, NSERC, & SSHRC, 2014) to “Research Involving the First Nations, Inuit, and Métis Peoples of Canada.” This document clearly lays out the expectation that
researchers will engage with Aboriginal communities that may be affected by their research, utilize a collaborative method, and ensure that the outcomes of the research project will benefit the communities in addition to the researcher (i.e., use a CBPR framework; CIHR, NSERC, & SSHRC, 2014). More importantly, researchers are encouraged to include community members in both the interpretation and dissemination of the results of the study (CIHR, NSERC, & SSHRC, 2014). This approach is invaluable in terms of identifying potential confounds and ensuring that the research does in fact benefit the relevant communities. Any researcher engaged in a truly collaborative research project would have formal and informal advisors available to consult regarding their findings, including any potentially harmful research outcomes.

Conclusion
This paper respectfully offers a cautionary note to colleagues interested in the use of large data sets, particularly when data analytic methods may lack the sophistication to account for complex relationships between variables. We offer recommendations to help ensure that data analyses and interpretations are appropriate.

References


An Exploration of the Effects of Mentor-Apprentice Programs on Mentors’ and Apprentices’ Wellbeing

Abstract
Increasingly, adult Indigenous language learners are being identified as the “missing generation” of learners who hold great potential to contribute to the revival of Indigenous languages by acting as the middle ground between Elders, children, and youth within their communities. Our research project NETOLNEW “one mind, one people” studied adult Indigenous language learning through the popular Mentor-Apprentice Program method. Over a 2-year period, our team conducted interviews and focus groups with participants involved in a Mentor-Apprentice type program in British Columbia, Canada. While our primary interest was to document the successes and challenges of the Mentor-Apprentice Program method for adult Indigenous language learning, we also included interview questions that gave participants an opportunity to share how participating in such a program affected them. During data analysis, we noticed repeating comments from participants about how their involvement with a Mentor-Apprentice Program impacted their own and their community’s wellbeing; 6 exploratory themes were identified. Although studies have reported protective effects of Indigenous language use on health, health-related outcomes of language revitalization efforts remain underexplored. In addition to discussing the exploratory themes that arose from the study, our paper also proposes that these themes can inform future research in investigating the links between language revitalization and wellbeing.

Keywords
Indigenous language, health, wellbeing, protective effects

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Introduction

Language is seen by Indigenous Peoples as a vital part of belonging to the community and is recognized as a driving force in transmitting culture (McIvor, 2013). The benefits of Indigenous language use remain largely unrealized in today’s context as there are few communities where an Indigenous language is spoken as the majority language (McIvor, 2013). In the province of British Columbia (BC), language learning is on the rise, but only 4% of the Indigenous population are fluent speakers of an Indigenous language, with 59% of them being over the age of 65 (First Peoples’ Cultural Council [FPCC], 2014). Yet Indigenous Peoples across Canada continue rallying to strengthen their languages, and we begin to see how these efforts are impacting individuals and communities in domains beyond language use, including their health. The World Health Organization defines health as not merely the absence of disease, but as “a state of complete physical, mental and social well-being” (World Health Organization, 1948, p. 1). It is this view of health we adopt in our study, as it relates to the holistic concept of wellbeing traditionally held by Indigenous Peoples (Reading & Wien, 2009).

In this paper we explore the connection between Indigenous language learning and wellbeing, a term we use to broadly capture people’s perceptions of subjectively meaningful positive thoughts and feelings with regard to their mind, spirit, and body (King, Smith, & Gracey, 2009; McIvor & Napoleon, 2009). The results we present here are part of our larger study on adult Indigenous language learning in BC. Based on a qualitative analysis of interviews with adult language learners and teachers, we propose six themes that could inform future research in the area of language revitalization and wellbeing.

Background

Indigenous communities in Canada are widely known for being strongly connected to land; focusing on family, community, and relationships; using humour for good health; and keeping traditions alive and cultural identities strong through these connections (Adelson, 2000; Greenwood, de Leeuw, Lindsay, & Reading, 2015; Taylor, 2015). Links between practising and strengthening culture and wellbeing are being identified in the prevention of illness and poor health habits. McIvor (2013) stresses the positive role of practising Indigenous cultures. As an
example, Varcoe, Bottorff, Carey, Sullivan, and Williams (2010) argue that Elders who become involved with youth and share their knowledge strengthen their traditional cultural role as leaders and can use this role to positively influence community health, such as by encouraging smoking bans or smoke-free events.

Observing and deepening an understanding of the links between culture and health are of great importance, as health and wellbeing in Indigenous communities, in general, remain significantly unsatisfactory in comparison to the general population (Adelson, 2005; Gracey & King, 2009; Kolahdooz, Nader, Yi, & Sharma, 2015; Reading & Wien, 2009). The connection between poorer overall health outcomes and the widespread effects of colonization has been widely documented and includes but is not limited to land loss; reduction of subsistence lifestyles and self-sustaining communities; loss of children to residential schools, day schools, and foster care; the general effects of religious conversion on the psyche; and stress related to racism towards Indigenous people in Canada (MacDonald & Steenbeek, 2015; Waldram, Herring, & Young, 2006). Researchers have also identified links between Indigenous health outcomes and low income, poor housing, low levels of formal education, high unemployment, and lack of social supports (Andermann, 2016; Rotenberg, 2016), as well as tobacco use and a lack of physical activity (Joseph et al., 2012). Many strategies used to improve these conditions in Indigenous communities have not been successful in adapting to and implementing Indigenous values and culture (Griffiths, Coleman, Lee, & Madden, 2016; Nesdole, Voigts, Lepnurm, & Roberts, 2014). And so there is growing recognition that elements such as identity, culture, spirituality, and wellbeing should be foundational to the development and implementation of new strategies if prevention and treatment are to be successful (Ashing-Giwa, 2005; King et al., 2009). Barwin, Crighton, Shawande, and Veronis (2013) suggest the use of traditional knowledge of wellbeing, such as medicine gathering, may lead Indigenous people to take greater ownership of their health and self-care and thus assist in the prevention of illnesses. Use of traditional medicine has also been highlighted as a factor affecting wellbeing by Hill (2009), and Currie, Wild, Schopflocher, Laing, and Veugelers (2013) show a correlation for Indigenous people between being knowledgeable about and practising or participating in their culture, and having lower rates of illicit and prescription drug abuse. Similarly, stating that “language revitalization occurs within the context of cultural revitalization” (p. 1), Bell (2016) reveals how incorporating traditional beliefs and practices of Haida food, medicines, rituals, and supernatural beings could contribute to the revitalization of Xaad Kil, the Haida language.

Traditional knowledge, which includes Indigenous worldviews and values (Auger, 2016), and intergenerational connectedness are only two aspects contributing to cultural continuity, a concept representing the degree of cultural and social cohesion within a community (Reading & Wien, 2009). Another contributing factor is language. Oster, Grier, Lightning, Mayan, and Toth (2014), for example, discuss a connection between maintaining Indigenous language and culture and lower rates of diabetes. High rates of diabetes in Indigenous people have been linked in the past with residential school trauma and its intergenerational transmission (Guo, 2016). The connection between cultural participation, language, and wellbeing in Indigenous communities in
Australia was also reported by Dockery (2011) and Biddle and Swee (2012). Healey and Meadows (2008) interviewed Inuit women in Nunavut who stressed the link between speaking Inuktitut and connecting with their cultural traditions. Hill (2015) reported that Indigenous learners of Kanyen’kéha (Mohawk) in Ontario feel more accepted in their community when they speak their language. Among Latin American children in the United States, Toppelberg and Collins (2010) identified bilingual competence as an essential part of bicultural acculturation and highlighted the role of acculturation in both the mainstream and Latino cultures for the wellbeing of Latino children. Finally, Hallett, Chandler, and Lalonde (2007) showed that BC Indigenous communities with a higher retention of their traditional language have lower rates of youth suicide.

The NETOLNEW Project—Adult Indigenous Language Learning Through a Mentor-Apprentice Approach

To date, the main focus of the Indigenous language revitalization movement in Canada has been to document Elder speakers and develop and implement preschool and K–12 immersion programs. Yet, as the fluent speaker population of Elders ages and passes on, the need for adult language learners to become the speakers in their communities is increasingly urgent. We also find that Indigenous adults take on the responsibility of passing on the language relatively early in their learning journeys, either by becoming teachers or in their role as parents and grandparents.

Language transfer continues to occur primarily in school settings (Ball & McIvor, 2013; McCarty, Nicholas, & Wyman, 2015; McIvor, Rosborough, & McGregor, 2017), but increasing the numbers of proficient teachers will allow immersion programs to expand and “ladder” into K–12 education (Boshier, 2015; Michel, 2012). Despite the importance of Indigenous adults being successful in their language learning, very few programs for adult Indigenous language acquisition have been documented to date, and most documentation has been limited to short case studies (King & Hermes, 2014; McIvor, 2015; Rātima & Papesch, 2014; Sarivaara, Uusiauttti, & Määttä, 2013). The NETOLNEW research project aims to contribute to our understanding of available methods for adult Indigenous language learners and identify successful strategies of language learning for this group. Specifically, we investigated the Mentor1-Apprentice Program (MAP) approach (Hinton, 2001).

NETOLNEW means “one mind, one people” or “doing things as one” in the SENĆOŦEN language spoken on southern Vancouver Island. This partnership involved the SENĆOŦEN language department of the W̱SÁNEĆ School Board, as well as the First Peoples’ Cultural Council (FPCC), a provincial organization that focuses a part of its programming on Indigenous language revitalization. Both partners run adult language-learning programs.

1 The approach is principally named “Master-Apprentice Program.” We use the word Mentor instead of Master, as preferred by both program partners participating in this study. However, the terms are synonymous.
FPCC runs a province-wide adult language-learning program closely based on the original Master-Apprentice Program (Hinton, 2002; Hinton, 2008). In this model of language learning, the adult language learner (apprentice) is paired with a fluent language speaker (mentor) for daily activities in an oral language-immersive context. The apprentice is expected to propose the activities, which may include travelling on the land, berry picking, and other traditional activities; cooking and home chores; shopping; or various types of conversations based on different topics and stimuli. The use of English and writing is strictly discouraged. The apprentice and mentor spend 300 hours per year together; the ideal length of the program is 3 years (900 hours) but is in large part subject to available funding.

The other partner, the W̱SÁNEĆ School Board, has been active in revitalizing the SENĆOŦEN language for over a decade, in part through using a MAP-like approach. The study participants from this community were mostly teachers and teacher assistants with the school board’s preschool and K–3 immersion programs who also assist with language immersion curriculum development.

Methodology

The larger overall study was qualitative in nature (Creswell, 2014); we worked with a large number of participants (N = 60) to capture varied experiences with language and collected a substantial pool of interview data, in many cases over an extended period of time, to co-study the phenomenon of being involved with a Mentor-Apprentice type of program. Some of the understandings explored in the larger overall study laid the foundation for our analysis of links between language learning, teaching, and use, on the one hand, and health and wellbeing outcomes for Indigenous people, on the other. Striving to establish a link between language (learning) and a holistic concept of wellbeing congruent with Indigenous understandings of health, we extended our primary methodology for this analysis through the concept of health-related quality of life (QOL). Health-related QOL is a framework commonly used to assess self-reported health outcomes (Land, Michalos, & Sirgy, 2012) and is considered responsive to diversity in cultural and socio-ecological contexts (Ashing-Giwa, 2005). Furthermore, health-related QOL as a construct comprises and reflects those domains (areas of life) important to a particular group (Patrick et al., 2011). Combining an overall qualitative approach with the health-related QOL model in this study provided us with an avenue to give prominence to the subjective experience of participants, while considering the health-related domains affected by language learning.

Methods

Alongside our partners, we co-developed an interview guide for use by the research assistants and community-based researchers. The interviews included both closed- and open-ended questions around participants’ experiences in MAP. Closed-ended questions included information about language-learning goals, activities, schedule, and their noted progress. Open-
ended questions included self-reporting of successes, challenges, and ways their language learning may have affected other areas of their lives. The participants were asked additional questions during their first and last interviews regarding their motivation, self-image, and interaction with others. The participants were not asked specifically about their health and wellbeing. The interviews were conducted by three people: one university-based research assistant, one community-based research assistant with long-standing and familial relationships with many of the participants in the WSÁNEĆ program, and one employee at FPCC who was known to the apprentices and mentors in that program.

Over the course of 22 months, from October 2014 to July 2016, 138 individual interviews were conducted with 60 participants. Participants were recruited from current and past cohorts of the Mentor-Apprentice type programs run by the two community research partners in this study. Interviews were conducted either by phone or in person, with participants either staying in their respective home communities across BC or travelling to the University of Victoria. Participants comprised current apprentices \((n = 23); \text{ each interviewed up to six times during the study to document the progress of their learning}), past apprentices who were considered by the research partners as “successful” in their language learning \((n = 10); \text{ each interviewed once}), current and past mentors \((n = 22); \text{ each interviewed once}), and program administrators \((n = 5); \text{ each interviewed once}). Participants represented 16 different Indigenous languages (in alphabetical order: Ditidaht; Gitxsan; Hulqumi’um’um’; Ktunaxa; Kwak’wala; Nsyilxcen; Nuu-chah-nulth; Nuxalk; Secwepemcstsin; SENĆOŦEN; Sháshíshálh; St’át’imcets; Tsilhqot’in; Wit’suwit’en; Wuikyala; Xiad K̓iy), reflecting about half of the rich linguistic diversity of BC (FPCC, 2014).

Interviews were recorded and transcribed by three trained research assistants. The transcriptions excluded fillers or repetitions; emotional responses such as laughter or crying were noted. Short and long pauses were noted as well. In the WSÁNEĆ interviews where SENĆOŦEN was spoken and understood by the community-based interviewer, the transcriptions were done first in that language and then translated to English. Where participants spoke other Indigenous languages during the interview, this was noted but the sections were not translated due to the diversity of languages and lack of familiarity of the transcriber with the language.

Thematic content analysis provides a tool for identifying meaningful themes within qualitative interview data (Braun & Clarke, 2006, 2014; Creswell, 2014). In this study, we used a thematic analysis approach, appropriate to exploring the participants’ subjective opinions, reflections, or beliefs (Percy, Kostere, & Kostere, 2015). The analysis was conducted using the data analysis software NVivo 11 for PC (QSR International). Following Percy et al.’s (2015) inductive analysis approach, each interview was coded individually without setting any pre-existing categories. Two of the research assistants completed the first round of open coding; sections that stood out were highlighted and saved in a separate folder in NVivo. The research assistants met twice during the coding process to exchange initial findings and observations, noting that they were in agreement with their first impressions. Following the first round of coding, the entire research team met to review the process and reflect on the initial codes. At that time, the team decided to further analyze the initial codes relative to MAP and health and
wellbeing. Two of the research assistants read and further condensed the codes into categories. Following this, the categories were discussed and combined, with initial descriptive names assigned. Six final themes emerged from these combined categories.

**Results**

Not all participants commented on all of the six final themes relating to MAP and health and wellbeing, but each theme was referenced during interviews with apprentices and mentors across both partner programs. The number of participants contributing a reference appears in parentheses following each theme below:

1. Cultural and spiritual health and healing (27 references)
2. Health outcomes (10 references)
3. Negative impacts of language loss on the wellbeing of Indigenous people (7 references)
4. Relationship between the commitment of MAP and wellbeing among participants (22 references)
5. Strengthening MAP apprentices to become future community leaders (19 references)
6. Elders’ healing through becoming language mentors (13 references)

1. **Cultural and Spiritual Health and Healing**

   *I am keeping something very precious alive by speaking my language.* (Jaskwaan Amanda Bedard, X̱aad Ḵl2)

   Indigenous concepts of health tend to be more holistic than the Western biomedical model (Hill, 2003) and take cultural and spiritual factors into account. This perspective of personal (and communal) health emerges in our study in the numerous references to cultural and spiritual health and healing. Significantly, this theme supports the notion that language revitalization efforts positively affect Indigenous people’s wellbeing (McIvor, 2013); in the case of MAP, our participants shared that reconnecting with their language “means everything to [them]” (Molly Wickham, Witsuwit’en). Participants viewed the contributions of language and language learning as equal to any other kind of sustenance: “I said [before], I want to go to school, I want to get rich, I want to take care of my family … I’m not going to be monetary rich, but you know I’m going to be able to take care of my family with [the language]” (Robert Louie, SENĆOTEN).

   Apprentices reported that learning their language has strengthened their identity; for example, Alexandria Peter (Secwepemc) shared, “It’s an identity thing, like when I learn my language it feels like I’m learning more of myself,” while Hla Algyax (Gitxsan) explained, “I feel more confident. I feel like I am, I’m getting to know who I am.” Additionally, reclaiming their language gave apprentices a sense of connection; in the words of Marilyn Napoleon

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2 Participants are identified by their English name, their traditional name, a pseudonym, or a generic description of their role in MAP, as chosen by each participant during the consent process.
An Exploration of the Effects of Mentor-Apprentice Programs on Mentors’ and Apprentices’ Wellbeing • Barbara Jenni, Adar Anisman, Onowa McIvor, Peter Jacobs • DOI:10.18357/ijih122201717783

(St’at’imcets), “I really can have a much better connection to my ancestors, our cultural knowledge, and our way of life. Because I know that there are a lot of things that they tell me, they can’t really translate to English.” Apprentices further noted that through learning the language they also learned how to conduct themselves in life and in relation to others; Crystal Tom (Gitxsan) explained, “The protocol that I’ve been learning, definitely. Being able to talk to people the right way, to be able to know what step that I need to take next,” while PENAWEN Elliott (SENĆOTEN) shared:

> When you see crazy things going on in the world, like, “Oh my god, what is wrong,” yah, you know, like, “What the hell is wrong?” then you think I’m sure glad we have our language, to keep us grounded, to keep us knowing.

Feelings of fulfillment and belonging through language learning, then, are meaningful outcomes for the wellbeing of MAP participants.

2. Health Outcomes

> When I take care of my health, I’m a lot better at learning. (Gisele Maria Martin, Nuu-chah-nulth)

In general terms, health outcomes refer to the effects a certain process has had, and may include changes in how people perceive their own health status or wellbeing. Apprentices and Elders shared that participating in MAP, and becoming involved in language learning, acted as a motivator to maintain general wellbeing. They also valued the impact their participation in MAP and learning a language had on them. “Part of my wellness is learning my language” (Marilyn Baptiste, Tsilhqot’in).

Language itself further provided some apprentices with a tool to connect with their emotions and process challenging times in their lives: “And it all has meaning to it too—it teaches you a lot of calming yourself down and behaviours and actions” (Helena Norris, SENĆOTEN).

Finally, participating in MAP profoundly supported at least three apprentices in their journey to recover from drug and alcohol addictions or break alcohol dependency patterns in their family. These apprentices explicitly referenced the decision and opportunity to learn the language as the influencing factor to their sobriety: “Language helps me in the times when I can’t function” (sən̓iʔwlm, Nsyilxcen). Embedded in this is also the relationship they formed with their Elder mentor, who often provided guidance beyond teaching language skills: “So I worked with [my] Elder, and she’s more than just my mentor, she … she helped me … in my life” (sən̓iʔwlm, Nsyilxcen).
3. Negative Impacts of Language Loss on the Wellbeing of Indigenous People

ƛulmapʔic doesn’t just mean a bad, misbehaving child, it also means a poor child that has been uprooted ... and is disconnected from their culture. (Gisele Maria Martin, Nuu-chah-nulth)

The impact of the residential school system and effects of colonization were discussed by participants throughout the interviews. Some of them more specifically shared how these events affected their wellbeing. Feelings of grief over the loss of the language, that “only just a handful of us … can speak our own language up and down the coast” (Axeiiwilhox, Gitxsan), were expressed by Elder mentors who had lived through the decimation of what was once their rich cultural and linguistic heritage. The trauma caused by colonial practices continues to affect individuals, families, and communities in complex ways, as “they have many struggles” (Dominique James, SENCOTEN). Participants talked about feelings of shame, embarrassment, and a sense of displacement, indicating that today’s language learners and teachers still wrestle with complicated grief (Spiwak et al., 2012), or in the words of Crystal Tom (Gitxsan), “I’ve been away from home for so long.”

4. Relationship Between the Commitment of MAP and Wellbeing Among Participants

There’s so much to be done ... that’s the exhausting part of it. It’s trying to learn and teach at the same time. (Ben Louis, Nsyilxcen)

Participating in MAP requires a commitment from both apprentices and mentors. As one administrator noted, “If anyone is a master fluent speaker, they’re probably already teaching full time in either our immersion stream or our exposure stream. They might be teaching part time in our partnership programs with UVic and teaching language in the evening, weekends. They also have families at home and community responsibilities” (Kendra Underwood, WSÁNEĆ School Board). Apprentices in particular often juggle MAP participation with family obligations, jobs, and other educational pursuits. Indeed, many of the apprentices in our study were parents of children under 18 and reported, for example, that their children’s health or their wish to spend more time with their family was a source of challenging scheduling conflicts. Participants also maintained demanding work commitments in their local First Nation governments, as teachers, or in other education-related positions, as well as in private contracting, environmental research, retail, and health professions. Almost half of the current apprentices reported being enrolled in accredited educational pursuits concurrent to participating in MAP, ranging from taking additional language courses through a BC university to being enrolled in graduate or postgraduate programs.

The challenge of adding MAP or language learning to one’s schedule appears to be counterbalanced at least to some extent, as participants—particularly apprentices—consistently stated that learning the language made them feel strengthened, having increased confidence and gaining an overall sense of empowerment. In the words of one apprentice, “One of the most
positive, hugest impacts of, on my life has been learning my language” (Gisele Maria Martin, Nuu-chah-nulth).

However, we also found signs of potentially detrimental effects on apprentices’ wellbeing resulting from their increasingly busy schedules. In their team agreement, apprentices commit to spending a minimum of 300 hours over the course of one school year, or 10 hours per week, with their mentor (required to receive modest grant funding). Most apprentices participating in our study invested considerable additional time on language-learning tasks outside of MAP: across 75 different interviews, 23 apprentices reported a range of 2–120 additional hours per month (including hours spent performing language-related work duties), with an average of 22.7 additional hours per month. Not surprisingly, fatigue and feelings of exhaustion were commonly experienced by apprentices and noted as counterproductive in relation to their language-learning goals. One participant shared feeling “fatigue. As in, of … being burnt out” (Adam Manson, Hul̓q̓umí’num). The time commitment of MAP also affected some participants’ ability to pursue health-related activities: “I’m not getting to do my walking because I work all day and then because I find when we walk I don’t really get the lesson” (Marilyn Napoleon, St’át’imcets).

Some participants also forgo other more lucrative professional options to attend MAP and therefore at times financial stressors contribute to the burdens carried by MAP participants: “Going with a minimum of things for such a duration of time … it does wear on you after a while” (PENAWEN Elliott, SENĆOŦEN).

5. Strengthening MAP Apprentices to Become Future Community Leaders

*It brings a huge sense of pride ... and helps me be an inspiration to anyone else.* (Adam Manson, Hul̓q̓umí’num)

Whatever impacts the participation in MAP may have on the apprentices as individuals, there is another dimension to the outcomes of MAP which indicates additional positive effects at the community level. Twenty of the apprentices interviewed (10 from each partner group) became (more) deeply and actively involved in their community through or following their participation in MAP; they took on roles as teachers, speakers, and leaders and continue to act as role models for others. Of all the interviewed apprentices, 15 specifically identified MAP as a factor in receiving job offers or promotions. Also, 10 apprentices mentioned their language-learning activities as a source of recognition in the community, and eight apprentices shared that they were asked to participate in or lead language or culture activities because they were known as language learners. Learning their language has made them “more confident to talk and knowing in front of [the] community” (Alexandria Peters, Secwepemc) and “want[ing] to be involved with interacting with those people that are doing or have the same ideas [about the] language and think the same way and really want to push that further into the community” (Molly Wickham, Witsuwit’en).

Through MAP, fostering apprentices to feel strong and confident to take on leadership roles in their communities will help them “be an inspiration to anyone else” (Adam Manson,
Hulq̓umi’um) and have continuous and far-reaching effects on Indigenous people in Canada to heal and create a positive future for themselves. Language lives when it is passed on from generation to generation, and colonial policies not only threaten the continuity of language but also intergenerational ties and links. Indigenous adults involved in MAP today understand that they are doing more than learning a language; they are contributing to their communities’ wellbeing. In the words of our participants, “I already had it in me that I wanted to learn [the language], but … my grandmother told me that I need to speak the language before I can work for the people” (Cheyenne Gwa’amuuk, Gitxsan); now “I’m gonna bring [our language] back to the people” (Adam Manson, Hulq̓umi’um).

6. Elders’ Healing Through Becoming Language Mentors

   We once again have that belief in ourselves where we can feel free. (STOLCEŁ, SENĆOŦEN)

   Having been affected by the residential school system, once fluent Indigenous people experienced shame about speaking their language and “didn’t want to use the language anymore” (a language mentor). For some of the now Elder mentors, this also meant suppressing memories of their language, and thus suppressing a part of themselves. The decision to become a mentor now was understandably often accompanied by a sense of apprehension, and some felt “very, very emotional” (a language mentor) or “afraid of mistakes [they] might make” (Levi Martin, Nuu-chah-nulth). But beyond those challenges, participation in MAP has provided many mentors with an opportunity to once again become engaged with their language, or to deepen their engagement. Becoming a mentor supplied a strong feeling of hope to Elder participants, or in the words of one participant: “As long as they keep remembering [the language], that’s our future” (Ruth A. Paul). The profound sense of continuity created through sharing the language was also recognized by apprentices: “It was really nice to be able to talk with [my granny]. Because she’s never done that with … any of her grandchildren before” (Cheyenne Gwa’amuuk, Gitxsan). The ability to use the language with others, to enjoy its beauty, to create songs, to think, and to be with others has provided a deeply healing experience for the mentors involved in MAP.

Limitations

The themes reported in this paper arose as a result of open-ended interviews, which were not specifically focused on health and wellbeing among participants. Our results are therefore based on reports of participants who chose to highlight the effects of language learning on their health and wellbeing. We acknowledge that by not asking all participants about the effects their participation in MAP has had on their wellbeing, we may not have captured the thoughts of all participants who otherwise would have contributed to the results presented here. However, Polkinghorne (2005) recognized that the topic of inquiry in qualitative research is at its core the “human experience as it appears in people’s lives” (p. 137), and thus we argue that these self-
reports likely underline the personal relevance each participant associated with his or her statement(s).

We also did not ask for information related to biomedical indicators of health, such as physical or mental illness, in our participants during the period of the study, or for information about chronic medical conditions, such as diabetes, asthma, or cancer. Such information could have provided additional dimensions to Theme 2, Health outcomes.

Lastly, Indigenous languages and Indigenous cultures are closely linked to one another. However, there is very little literature that compares and contrasts or seeks to distinguish the effects of Indigenous language learning on health and wellbeing versus the effects of learning culture or how they are interconnected (Ball & Moselle, 2013; McIvor, 2013; McIvor & Napoleon, 2009). Participants in this study were constantly engaged in learning culture through language, by participating in activities such as ceremonies and cultural protocols, berry picking, learning about their traditional territory and Indigenous plant use, basket weaving, and more.

**Discussion**

The primary focus of the larger this study was to understand successes and challenges experienced by adult Indigenous language learners using the MAP approach. Although not unexpected, the degree to which MAP also affected wellbeing and health was surprising. The results from our study echo McIvor’s (2013) conclusion that language (and culture) appears to function not only as a protective factor, encouraging the likelihood of positive outcomes or discouraging the likelihood of negative outcomes (Blum, 2004; Zolkoski & Bullock, 2012), but also as a preventative measure.

Language is not yet widely acknowledged as a factor in the broader academic discourse and conception of health and wellness (Whalen, Moss, & Baldwin, 2016), which remains dominated by Western worldviews (Wolsko, Lardon, Hopkins, & Ruppert, 2006). Researchers are beginning to examine other ways to measure health and wellbeing, including the concept of resilience, or the ability to maintain positive behaviours and health outcomes despite increased social risk factors such as poverty, trauma, and discrimination (Fleming & Ledogar, 2008; Ledogar & Fleming, 2008; Panter-Brick & Eggerman, 2012; Wexler, DiFluvio, & Burke, 2009). Resilience in Indigenous communities has been repeatedly linked with a sense of belonging to the community and solidarity (Dockery, 2011; Greenwood & de Leeuw, 2012; Healey & Meadows, 2008; Kirmayer, Simpson, & Cargo, 2003; Ledogar & Fleming, 2008; Ruiz-Casares, Guzder, Rousseau, & Kirmayer, 2014).

In this study, participants in MAP offered their insights on the connection between language learning and the effects on their lives. Most participants repeated themes that have to do with the preventative measures of resilience; they linked their language learning to impacts including finding comfort and achieving sobriety, a theme echoed by Currie et al. (2011); personal empowerment and achieving leadership positions within their community; healing from residential school trauma; and improving their cultural and spiritual health, all of which play a large part in Indigenous holistic concepts of wellbeing and health (Hill, 2003). Wexler et al.
(2009) suggest that cultural resilience in Indigenous communities is the result of an active production of culture that creates meaning and allows Indigenous people to have a positive view of their identity. The MAP participants in this study repeatedly discussed the ways in which they created personal and collective meaning through practising their languages and cultures and by participating in and creating a sense of belonging and community. Through choosing to apply to and participate in MAP and to learn their language, mentors and apprentices took an active step towards larger participation in their community. Many participants reported reciprocal reactions from their community: through job offers, promotions, opportunities, or other types of recognition, their contribution was positively reinforced by the community itself. The six themes that emerged from the interviews, although exploratory, suggest that MAP may provide a mechanism to build resilience in language learners and teachers and, furthermore, improve MAP participants’ quality of life (QOL), including their health-related QOL.

We propose that the six preliminary themes emerging from our data can be used as a starting point to future research aimed at better understanding the health outcomes associated with MAP, and may possibly inform which health-related areas of life (domains) are (most) meaningfully affected through language revitalization efforts overall. Because of the multidimensional and subjective nature of health-related QOL (Bakas et al., 2012), we recommend involving apprentices and mentors from the onset of any ensuing research to ensure that relevant wellness concepts are generated and subsequent questions provide answers of good content validity, while truthfully capturing the perspectives and experiences of Indigenous language learners and teachers.

**Conclusion**

Recent studies into the link between language and health and wellbeing have demonstrated that inquiry into this connection is of value and achievable despite methodological challenges. Our study offers support for further investigation of the impacts of the Indigenous language revitalization movement beyond the use of language. We encourage further development in this area of study to support the continued empowerment of Indigenous Peoples to use and recover their languages and cultures, in part to positively contribute to the increased health and wellbeing of Indigenous people.

**References**


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“It’s huge in First Nation culture for us, as a school, to be a role model”: Facilitators and Barriers Affecting School Nutrition Policy Implementation in Alexander First Nation

Abstract
This mixed-methods community-based participatory research generated knowledge of school staff perceptions of the facilitators of and barriers to implementation of a Canadian First Nation school’s healthy nutrition policy. Themes derived from seven qualitative staff interviews were integrated with quantitative data derived from 28 staff surveys. The Medicine Wheel was used to describe results, as it provided a non-hierarchical and relational way to categorize all components and stakeholders of nutrition policy implementation. Factors that facilitated policy implementation were associated with the school environment, including the nutritional quality of foods sold or offered at school, administrative support, and foundational health programming prior to policy development. Staff identified the school as a role model for community members and as a key facilitator of policy implementation (for example, in leading health initiatives, providing a place for nutritious food and physical activity opportunities, and acting as a health resource for all community members). Barriers included inconsistency between staff members in policy implementation, uncertainty about staff members’ role in policy implementation, and lack of school communication with parents regarding the policy. One of the informative barriers from a First Nation perspective was the perceived misalignment of traditional foods, such as bannock or wild game, served at First Nation cultural events with federally derived nutrition standards that emphasize a low-fat diet. Results suggest strengthening school nutrition policy implementation by increasing staff nutrition education and certainty of their roles as policy facilitators, advocates, and enforcers; improving communication with families; having supportive school health programming; and ensuring the school, community, and home environment all reinforce healthy eating.

Keywords
First Nations, Aboriginal, Indigenous, public health, schools, nutrition policy, health behaviour, evaluation, community-based participatory research, culture

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Introduction

As children spend the majority of their waking hours at school, schools are important settings for implementing health behaviour change interventions. School nutrition policies are an important pillar in comprehensive school health that seek to guide and create a healthy learning environment for students (Joint Consortium for School Health, 2008). School nutrition policies can change the food environment of a school through actions such as removing or reducing the availability of unhealthy foods, incorporating nutrition concepts into the school curriculum, and creating partnerships with health professionals in the school’s community (Joint Consortium for School Health, 2008). Healthy school policies set a standard for the school and provide guidelines for the operation of a health-focused environment.

There is an urgent need for school nutrition programs in Indigenous communities in Canada to enable a healthy environment for learning and to ensure children are able to attain optimal health; yet there has been little assessment of health program and policy implementation in Indigenous schools (Browne, Hayes, & Gleeson, 2014) apart from an intensive evaluation of a few community schools (Kakekagumick et al., 2013) and a decade-old environmental scan of nutrition programs and policies in First Nation schools (Assembly of First Nations, 2008). The scan found that half of schools with a nutrition program saw a need to improve or expand upon it.
and that lack of funding, staffing concerns, and infrastructure costs were the main barriers to implementing a nutrition program (Assembly of First Nations, 2008).

Further attention is required to the sharing and exchange of knowledge in the area of school nutrition programs and policies in Indigenous settings. The barriers and facilitators (that is, enablers) of nutrition policy implementation in an Indigenous school setting may be unique (Tagalik, 2010). It is important to evaluate Indigenous school health initiatives so that their approaches can be adjusted, if necessary, to ensure their success. Knowledge gained from such efforts can also be used to support other Indigenous communities’ efforts to implement or improve their own school health policies (Assembly of First Nations, 2008).

In March 2014, Kipohtakaw Education Centre, the kindergarten to Grade 12 community school in Alexander First Nation northwest of Edmonton, Alberta, adopted a healthy school nutrition policy that had been developed by the Nation’s Education Department. A tenet of the policy was that the school would promote nutrition education while also promoting and providing nutritious snacks and meals consistent with Eating Well with Canada’s Food Guide: First Nations, Inuit and Métis, which was created by Health Canada (2007) to reflect the values, traditions, and food choices of Canada’s Indigenous Peoples. All school staff were to ensure that strategies were in place to foster the knowledge, skills, and attitudes that promote healthy eating; Kipohtakaw Education Centre was to promote healthy, reasonably priced food choices when food was sold or otherwise offered; and Kipohtakaw Education Centre was to examine its nutrition practices and provide opportunities, support, and encouragement for staff and students to eat healthy foods. The school offered students both a breakfast and hot lunch at no charge. The policy was developed with the intention that it would ripple into the broader community and improve all community members’ health and well-being. The intent of this study was to explore staff-perceived facilitators and barriers that affected the implementation of this locally developed school nutrition policy.

**Relationship**

In 2006, a community-based participatory research (CBPR) partnership to prevent childhood obesity was conceptualized between academic researchers from the University of Alberta and the Director of Education of Alexander First Nation (Gokiert et al., 2017; Pigford et al., 2013). The present study was a continuation of this CBPR partnership to ensure the health and well-being of children in the community. The research was overseen by the research steering committee for the project, known as the Alexander Research Committee (ARC). The ARC helped to ensure that the research met the needs of the community’s Education Department while also being scientifically rigorous. At the time of the research, ARC membership included community co-researchers working at Kipohtakaw Education Centre (e.g., school principal) and at the community’s Education Department (e.g., director) alongside academic co-researchers from the University of Alberta and their graduate students from the various CBPR projects being governed by the ARC.
The ARC abides by a *Guiding Principles* document for research in the community that was first established in 2007. It outlines rules for data collection, storage, and use; ethical conduct in relation to research; and the community’s status first and foremost as the primary beneficiary of research (Gokiert et al., 2017; Pigford et al., 2013). As such, research that abides by the *Guiding Principles* honours principles of ownership, control, access, and possession (OCAP),¹ which are essential standards for conducting research with First Nations. Using these *Guiding Principles*, the ARC helped to create survey and interview questions, and reviewed the findings of the present research for credibility and dependability of interpretation (Israel, Eng, Schultz, & Parker, 2012). For instance, the ARC aligned thematic results with the Cree Medicine Wheel used in the community (discussed below). Consultation with the community members of the ARC occurred to ensure the appropriate representation of findings using the Medicine Wheel framework, as the colours and orientation of the Wheel are integral to its meaning. Community Elders were present to provide guidance about respectful cultural representation and research use of the Medicine Wheel.

**Methods**

In September 2014, community members of the ARC alongside University of Alberta researchers of the ARC began drafting the methodology for assessing the barriers and facilitators affecting implementation of Kipohtakaw Education Centre’s nutrition policy as it existed at the time (see Appendix).

In order to fill knowledge gaps in research on First Nation school nutrition policy implementation, this study drew on the strength of both qualitative and quantitative methods. A 23-item survey (20 closed-ended and 3 open-ended questions) completed in May 2015 generated the quantitative data, while semi-structured face-to-face interviews with 10 questions completed in May and June 2015 generated the qualitative data. The aim of the interview questions was to elicit a deeper understanding of responses to the staff survey. The inclusion criteria for participation required staff to have a school mailbox in which to place a consent form and the survey; therefore, teachers, education assistants, principal, vice-principal, school counsellor, and school hot lunch staff were included in the study, while Elders who worked at the school were not included. Identifying information such as subject taught and Indigenous identity was not asked of participants to help ensure anonymity of data.

Quantitative survey data were analyzed using SPSS (Version 22.0) for response frequencies and chi-square and Fisher’s exact tests. A graduate student who had completed a course in qualitative research transcribed the interviews verbatim and analyzed them using conventional content analysis (Krippendorf, 1989) under the supervision of academics with expertise in qualitative research methods. Open coding was used to develop descriptive labels that were assigned to transcript excerpts, and a second coder reviewed the labels to verify

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¹ OCAP® is a registered trademark of the First Nations Information Governance Centre (FNIGC; www.FNIGC.ca/OCAP.html).
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reliability of the analysis. Codes were quantified based on the frequency of their occurrence in transcripts and the number of interviewees that mentioned them (Castro, Kellison, Boyd, & Kopak, 2010). Codes were aggregated into themes based on similarity and relationship to each other (Auerbach, 2003). The aggregated themes were presented to the ARC for review and interpretation that would inform the development of the final themes. A score was provided for each theme that was a product of the frequency of occurrence of each code within the seven transcripts multiplied by the number of interviewees whose transcripts mentioned the code. Each interviewee was assigned a number from one to seven, and this number was provided when a quote was used to support a theme.

Facilitators of and barriers to nutrition policy implementation from the qualitative interviews were originally organized by the researchers from the University of Alberta into a socio-ecological model (Townsend & Foster, 2011). After this framework was reviewed by community members of the ARC, the decision was made to organize the themes into the four quadrants of the community’s version of the Cree Medicine Wheel to represent a holistic and culturally appropriate interpretation of findings (Graham & Leeseberg Stamler, 2010). The Medicine Wheel was considered by Alexander First Nation community members guiding this study, including two Elders, to be a more appropriate framework to organize results because it provided a non-hierarchical and relational way to categorize all components and stakeholders of school nutrition policy implementation (Wenger-Nabigon, 2010). A concurrent triangulation mixed-methods approach (Yin, 2009) was used to synthesize the findings from the surveys and interviews (Creswell & Plano Clark, 2010).

Ethics

This study was conducted according to the guidelines laid down in the Declaration of Helsinki (World Medical Association, 2013), and all procedures involving human subjects were approved by the University of Alberta’s Research Ethics Board 1. Written informed consent was obtained from all participants.

Results

Of the staff members with a mailbox at the school, 80% completed the survey (n = 28 of 35). Of the 28 survey participants, 27 (96.4%) answered all closed-ended questions and 24 (85.7%) additionally answered the open-ended questions. Of those who responded to all of the questions, 13 (54.2%) provided contact information to participate in the individual interview, and of these, 7, representing 20% of school staff, were able to be interviewed before the end of the school year. These interviews provided rich data that was layered, intricate, detailed, and nuanced. Further coding was not possible after the seventh interview; therefore, data saturation was achieved (Fusch & Ness, 2015).
Facilitators of and Barriers to School Nutrition Policy Implementation

Figure 1 shows themes derived from qualitative interviews that identified facilitators of or barriers to school nutrition policy implementation, organized within the four quadrants of the Medicine Wheel. Each quadrant represents a distinct ecological category, which are staff, student, school, and community and culture. The colours used in the figure are appropriate for a Cree Medicine Wheel from Alexander First Nation, with blue in the west (left), white in the north (top), yellow in the east (right), and red in the south (bottom).

Figure 1. Staff-perceived facilitators of and barriers to Kipohtakaw Education Centre school policy implementation, organized within the quadrants of a traditional Cree First Nation Medicine Wheel.

Facilitators of School Nutrition Policy Implementation

Table 1 shows the score for each theme derived from qualitative interviews that identified facilitators of school nutrition policy implementation, within each of the four categories of the Medicine Wheel. Table 1 also shows exemplar quotes derived from the qualitative interviews that support each theme, in addition to supportive statistics derived from the survey. Important and noteworthy facilitators are discussed following the table.
"It’s huge in First Nation culture for us, as a school, to be a role model": Facilitators and Barriers Affecting School Nutrition Policy Implementation in Alexander First Nation • Kris Murray, Alexander Research Committee, Anna Farmer, Katerina Maximova, Noreen Willows • DOI:10.18357/ijih1222017177784

Table 1
Staff-Perceived Facilitators of Kipohtakaw Education Centre’s Nutrition Policy Implementation Within Each Ecological Category Ranked by Score and Accompanied by Example Interview Quote and Supporting Survey Statistic

<table>
<thead>
<tr>
<th>Theme</th>
<th>Scorea</th>
<th>Exemplar interview quote (Interviewee #)</th>
<th>Quantitative survey statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STAFF FACTORS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff support for the nutrition policy</td>
<td>20</td>
<td>“[Staff] all work together and bring our ideas together [around healthy alternatives].” (5)</td>
<td>26.3% (n = 5/19) of staff indicated in an open-ended survey question that other knowledgeable staff helped them the most to deliver quality nutrition education to students.</td>
</tr>
<tr>
<td><strong>STUDENT FACTORS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student acceptance</td>
<td>18</td>
<td>“In elementary [grades] they do talk about health. They have to learn it in school, right? So they come home and say, ‘No, kukum [“grandmother” in the Cree language], that’s not good for you, you need to eat this,’ you know, celery or whatever.” (1)</td>
<td>67.9% (n = 19/28) of staff members believed the school nutrition policy has impacted the way students are eating at school.</td>
</tr>
<tr>
<td><strong>SCHOOL FACTORS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous healthy school programming</td>
<td>60</td>
<td>“The school’s done well, we’re the first APPLE School for First Nation school boards, we had EarthBox [garden] planting vegetables and things like that, and the apples, and now this nutrition policy.” (5)</td>
<td>The majority of interview participants (71.4%; n = 5/7) mentioned previous programs that have created a healthy school environment previous to the policy dissemination.</td>
</tr>
</tbody>
</table>
“It’s huge in First Nation culture for us, as a school, to be a role model”: Facilitators and Barriers Affecting School Nutrition Policy Implementation in Alexander First Nation • Kris Murray, Alexander Research Committee, Anna Farmer, Katerina Maximova, Noreen Willows • DOI:10.18357/ijih122201717784

| Environment consistent with policy | 20 | “Whoever is shopping for the canteen knows what they’re doing and then the hot lunch program, the cook is on board too and so there’s fruit and vegetables. The kids have noticed the difference having a healthy lunch and having energy.” (5) | 78.6% (n = 22/28) of staff members agreed or strongly agreed that healthy food was available and 64.3% (n = 18/28) of staff members agreed or strongly agreed that administrators have created a school environment that helps children eat healthy foods. |
| Administrative support | 20 | “We had a meeting at the beginning [of the year] and we went over the policy in great detail.” (6) | 67.9% (n = 19/28) of staff members agreed or strongly agreed that administrators had helped them prepare to implement the school nutrition policy. |

**COMMUNITY AND CULTURE FACTORS**

| School role as support system and role model in community | 48 | “It’s huge for First Nation culture for us at [the school] to be a role model.” (5) | Not applicable. Question about this topic not asked on the survey. |
| Parental support | 20 | “I know that parents have been trying to make an effort, you know, have healthier choices.” (6) | 89.3% (n = 25/28) of staff indicated that they had not been contacted by parents regarding resistance to the school nutrition policy or the change in foods available to students. |

*a A score is provided for each theme that is a product of the frequency of occurrence of each code multiplied by the number of interviewees whose transcripts mentioned the code.*

b **APPLE** = Alberta Project Promoting Active Living and healthy Eating (APPLE Schools; www.appleschools.ca).
Previous healthy school programming. When interviewees were asked if they perceived the healthy changes at the school as a gradual process or as a quick development after the policy was implemented, the majority of interviewees who had taught at the school for at least one year (80.0%; \( n = 4/5 \)) acknowledged the changes had occurred gradually over time, often citing health-based community research projects at the school that dated back almost a decade as the reason for the gradual change (Gokiert et al., 2017; Pigford et al., 2013). Interviewee 1 suggested that previous health programs and research initiatives in the community had provided plenty of groundwork for the development of a school nutrition policy: “[Healthy changes] were kind of happening before, just slowly bringing in a little bit of things, you know, and then when the policy came in it wasn’t like a shock to everybody.” The gradual environmental transition, removing unhealthy foods from the canteen and incorporating more fresh and nutritious ingredients into the school lunch menu, was viewed by staff as a significant enabler to the implementation of the school nutrition policy. Staff took notice of the environmental changes, with Interviewee 6 noting, “The kitchen staff is making sure that they have the assistance of a dietitian to plan menus.” Health-oriented programming that preceded the implementation of the school nutrition policy was a significant influence in preparing the staff and student mindset for applying healthy changes, eventually leading to the initiation and development of the school nutrition policy.

Environment consistent with policy. The consistency of the school environment with the school nutrition policy tenets and the availability of nutritious options for students and staff assisted in the implementation of the school nutrition policy. In regards to the food environment 78.6% of staff (\( n = 22/28 \)) agreed or strongly agreed on the survey that healthy food was available at the school. Additionally, 64.3% of participants (\( n = 18/28 \)) reported that administrative staff had created a school environment that helped children eat healthy foods. While all staff had not unanimously implemented the school nutrition policy, there were key “health champions” that supported the policy and were crucial to creating a conducive environment for policy implementation.

Administrative support. Most (67.9%; \( n = 19/28 \)) agreed or strongly agreed that administrators had helped them prepare to implement the school nutrition policy and cited instances in which staff functions were organized to reflect the nutrition policy with healthy choices for food. Interviewee 1 said, “[Administration] tries to promote healthy [alternatives] when we have functions here without the kids. We have all the fruits and vegetables and sandwiches and I haven’t heard any complaints.” As the school nutrition policy was administrator driven, the support for healthy changes has been consistent and maintained since policy development.
School role as support system and role model in the community. A significant community and cultural facilitating factor for school nutrition policy implementation identified by staff was the school’s role in the community of Alexander First Nation. The role was described as providing support, modelling behaviour, and acting as a resource. Participants recognized the importance of their double role, first as educators at the First Nation school and second as community role models, and acknowledged the effect that their leadership with school policies and nutrition initiatives could have on the health of the entire community. “It’s going to be a trickle effect in people’s lives and that’s good for all of us. Change is hard,” indicated Interviewee 5, also saying, “At least at the school, we can provide healthy alternatives and that has been just rolling out to individual people now and they’re going to be thinking, ‘Well, if at the school I can’t bring candy or cookies and cupcakes, well, then, what about my own eating?’” Staff identified that the school had a role model effect in the community, and the health initiatives occurring within the walls of the school would most likely not stay in those confines. Interviewee 7 stated eloquently, “I think it’s one of the best things we could be doing for the students and for the community because ultimately that’s who it’s going to affect.”

Barriers to School Nutrition Policy Implementation

Table 2 shows the score for each theme derived from qualitative interviews that identified barriers to school nutrition policy implementation, within each of four categories. Table 2 also shows exemplar quotes derived from the qualitative interviews that support each theme, in addition to supportive statistics derived from the survey. Informative barriers with respect to policy implementation are discussed following the table.

Table 2
Staff-Perceived Barriers to Kipohtakaw Education Centre’s Nutrition Policy Implementation Within Each Ecological Category Ranked by Score and Accompanied by Example Interview Quote and Supporting Survey Statistic

<table>
<thead>
<tr>
<th>Theme</th>
<th>Score</th>
<th>Exemplar interview quote (Interviewee #)</th>
<th>Quantitative survey statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAFF FACTORS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff find the nutrition policy restrictive</td>
<td>33</td>
<td>“I personally don’t think I should have to eat healthy all the time because that’s not how I eat. I’m kind of putting this false façade into these kids like I’m some kind of nutrition freak but I’m not.” (3)</td>
<td>Only 6 of 11 staff (54.5%) who indicated they ate a diet of average quality agreed or strongly agreed with the policy statement that only healthy food will be served at school and classroom celebrations, compared to 13 of 15 staff (86.7%) who stated that their diet was “above average” ($p = .096$).</td>
</tr>
</tbody>
</table>
### Inconsistency of staff policy implementation

- **12**

  “To be honest I didn’t even know there was a policy until you [researchers] came here.” (1)

  25% ($n = 5/20$) of staff responded that staff resistance or staff refusing to abide by policy was a barrier to nutrition policy implementation.

### Staff unsure of role in policy

- **12**

  “Just for the position that I have now I don’t feel that I get to have a bigger role in [nutrition] education.” (7)

  Staff were more likely to strongly agree with policy statements that were explicit ($57.1\%; n = 16/28$) compared to statements that were vague ($39.3\%; n = 11/28$).

### STUDENT FACTORS

### Student preference for unhealthy foods

- **45**

  “When their palates are used to that kind of food and then they come here and they have the option of healthy food versus something packaged, then, you know, their tendencies are to go with something they’re comfortable with.” (7)

  39.3% of staff members ($n = 11/28$) cited “lack of interest from students” as a moderate or major barrier to providing quality nutrition education in accordance with the policy.

### Inconsistency of policy buy-in by students in higher grades

- **40**

  “Elementary children always … listen to what their teachers say and their parents say, but by the time they get to junior high of course the teachers don’t know anything.” (6)

  When asked about the biggest barrier to implementing the school nutrition policy, 30% ($n = 6/20$) of staff suggested student resistance was a significant barrier, with 33.3% ($n = 2/6$) of those who suggested student resistance explicitly citing high school students as the most non-compliant.

### SCHOOL FACTORS

### Lack of communication with parents

- **24**

  “I don’t think some of the parents understand there is a nutrition policy.” (1)

  89.3% ($n = 25/28$) of staff members indicated that they had not been contacted by parents regarding resistance to the school nutrition policy or the change in foods available to students at school. Yet “Resistance from parents of students” was cited as a moderate or major barrier to providing quality nutrition education in accordance with the policy by 50.0% of staff members ($n = 14/28$).
“It’s huge in First Nation culture for us, as a school, to be a role model”: Facilitators and Barriers Affecting School Nutrition Policy Implementation in Alexander First Nation • Kris Murray, Alexander Research Committee, Anna Farmer, Katerina Maximova, Noreen Willows • DOI:10.18357/ijih122201717784

<table>
<thead>
<tr>
<th>Special occasions</th>
<th>9</th>
<th>“I notice that in the kitchen she makes cupcakes and stuff, [saying] ‘Ugh, just this once,’ but, like, just this once is once a month.” (4)</th>
<th>71.4% (n = 5/7) of interview participants explicitly mentioned exceptions or treats or moderation and lack of clarity in the policy about such situations.</th>
</tr>
</thead>
</table>

**COMMUNITY AND CULTURE FACTORS**

| Change in habits takes time | 15 | “It’s always, like, the first few years when you try anything you’re not going to see the total effects.” (6) | Not applicable. Question about this topic not asked on the survey. |
| Community environment does not support the school nutrition policy | 10 | “Then you kind of throw out the health thing for [culture], but then we want everyone to be healthy, but we want [the students] to know the culture, so you’re just kind of clashing there … if this is cultural, if this is important to us, then why can’t we have that every day?” (3) | Not applicable. Question about this topic not asked on the survey. |

*A score is provided for each theme that is a product of the frequency of occurrence of each code multiplied by the number of interviewees whose transcripts mentioned the code.

*Fisher’s exact test.

Inconsistency of staff policy implementation. One staff member (Interviewee 1) admitted to not being aware there was a policy until researchers had arrived to ask about it, and another (Interviewee 3) said they were aware of the policy but had never taken the time to read it: “That’s my fault, because they had a couple printed out but I didn’t actually go through it. I don’t have time to go through it. I have, like, no prep [time].” On the other end of the spectrum, other staff members were fully aware of the policy and had implemented changes into their classroom environment. For instance, Interviewee 5 said, “I put up the Canada Food Guide, both our Cree one and our English one and the kids are over there reading it … we count our number of fruits and vegetables we’re getting in our lunch meal … they run over to the chart and say, ‘[I am] supposed to have seven to eight a day.’” Some staff felt that other competing student issues were higher priority than policy implementation, as explained by Interviewee 7:

*There are just so many issues sometimes at the school, whether it’s cell phones, whether it’s attendance, whether it’s language, whether it’s, you know, food is just like sometimes you need to pick battles and if you want kids to come to school, what are you going to pick? Are you going to take away their chips?*

The inconsistent delivery of policy objectives by school staff presented a barrier to policy implementation.
Staff unsure of role in policy implementation. Staff members were uncertain of their role as nutrition policy facilitators, advocates, and enforcers. In particular, staff did not feel it was their role to enforce the school nutrition policy and were unsure what to provide students for healthy snacks that followed the policy. Staff cited, for example, competing priorities and anxiety over being the only enforcer of the policy as reasons for refraining from taking on a policy advocate role. As the vast majority of staff members were not health educators, many felt the school nutrition policy was not part of their daily classroom responsibility, as one interviewee stated: “I’m a [subject\(^2\)] teacher, so I’m not going to, like, stop in the middle of [subject] class and talk about nutrition.” In terms of direct policy statements about staff members’ role in school nutrition policy adoption, exemplification, and implementation, participants were more likely to strongly agree with statements from the policy that were explicit, such as “[School staff] will limit the use of food items as rewards. For example, no candy for cleaning desks or finishing work early” (57.1%; \(n = 16\)), compared to more ambiguous policy statements, such as “[School staff] will establish linkages between health education and foods available at the school” (39.3%; \(n = 11\)).

Participants were unsure which healthy snacks to provide to students in their classrooms. Some participants reported having stopped giving any snacks after being informed they could no longer provide certain packaged foods to students that did not honour the policy: “I’ve been concerned about [what to give students as snacks]. When the kids don’t want to eat what’s being served from the kitchen, what do you do? You’ve got nothing to give to them.” However, other staff ignored the policy and continued to provide packaged and other “unhealthy” snack food, claiming that unhealthy food is better than no food at all. As Interviewee 3 articulated, “I don’t think about the nutrition policy, I think about, okay, this child is hungry so I’m going to satisfy the hunger, whether it’s a granola bar with chocolate chips in it or whether it’s an orange.”

Lack of communication with parents. Lack of communication with parents regarding the policy was perceived by staff as a barrier to school nutrition policy implementation. This was because some parents were still sending meals and snacks to school with their children that did not comply with the policy due to their lack of awareness of it. “Resistance from parents of students” was also perceived as a moderate or major barrier to providing quality nutrition education in accordance with the policy by 50.0% \((n = 14)\) of survey respondents. Participants perceived parental involvement as beneficial to school nutrition policy implementation, with Interviewee 4 claiming, “Gradually making [parents] aware of what’s going on at the school, about the nutrition policy because personally I don’t think some of the parents understand there is a nutrition policy.” Staff perceived the parents as being potentially unaware there was a policy or what it required of them as parents of students attending the school. Interviewee 6 emphasized this barrier by saying, “We still need to have avenues where we meet with [parents], where we

\(^2\) Subject taught (e.g., science, math, or English) removed to ensure anonymity of participant.
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could talk directly to parents and to show them the benefit too of leading, of teaching by example.”

Community environment does not support the school nutrition policy. An important theme derived from the data was the contrast between the community nutrition environment and the school nutrition environment. There were three main characteristics of the community environment that exemplified how it did not support the school nutrition policy. One feature of the community environment was that foods served at cultural events sometimes differed from those endorsed by the policy at school. A second feature was that the home food environment did not always support healthy eating. A third feature was that the community’s only store, which was a gas bar, had few healthy food options.

Participants perceived both health and culture as important school priorities. Staff viewed cultural events and celebrations as a significant part of the local First Nation culture but indicated that not all foods served at such events held at the school adhered to the school nutrition policy. As Interviewee 7 mentioned, “You know sometimes we have [name of cultural event3] and cookies are passed around and so there seems to be exceptions anyway.” During these school events, staff members were unsure how to enforce the policy. Interviewee 3 stated,

*It’s traditional4 food so we’re not counting calories, we’re not counting nutritional factors because it’s about the culture, but really if you take a look at it, it’s not healthy. ... We want everyone to be healthy, but we want [the students] to know the culture, so you’re just kind of clashing there. You get mixed information and if as a staff [member] I’m getting mixed information how much more confused are the kids, right?*

Staff members could easily identify instances in which they were confused over whether the policy was to be enforced and if and how “moderation” in consumption applies to cultural food situations.

Home food environments may not support healthy eating. Staff members acknowledged that as policy facilitators, they can only control what is served or offered at school and not restrict foods brought from home or sent by parents. Unhealthy foods at home may influence student resistance to adopting healthy eating practices at school, as Interviewee 4 remarked: “The kids never have stuff like that [beans and zucchini] … they don’t eat that at home so they’re not going to eat it here.” Interviewee 2 touched on the challenge of educating students to eat healthy foods at school when there is potentially a contrasting food environment at home: “It’s hard for [staff members] to train them how to eat in school, especially [when] you don’t know what they’re eating at home.”

Another example of how the community nutrition environment does not reinforce the healthy school nutrition policy and its efforts to serve or sell exclusively healthy food is that in

3 Within an oral culture, certain ceremonies and cultural events are not to be written down.
4 Traditional foods are those with cultural significance, such as meat obtained from wild animals.
Alexander First Nation there is only one convenience store that sells food. It does not provide many nutritious options. Staff members occasionally referred to the school nutrition policy as “restrictive” based on the local community context, with Interviewee 3 stating, “I find there needs to be a nice balance between this nutritional policy and what’s rational and what’s ideal for this community and for this school.” Staff members were unsure how to approach this juxtaposition between the community nutrition environment and the school nutrition policy that could potentially hinder policy implementation, particularly as it relates to the importance of First Nation culture and community.

Limitations

A limitation of this study is that we were unable to link individual survey responses to interview data because we did not ask participants to provide any identifying information when they completed the survey to ensure their anonymity. Another limitation is that it was not feasible to pilot-test the survey in a small school, as we would have included the same school staff members in the piloting of the survey as in the completion of the version used for the study. The lack of pilot survey data meant that we were not able to evaluate the survey’s adequacy as a research instrument; however, questions on the survey were either borrowed from validated surveys or reviewed for appropriateness by community members of the Alexander Research Committee. Another limitation is that Elders from Alexander First Nation working at the school were not included in the study because they did not have a school mailbox. Elders could have provided unique insight into the school nutrition policy’s implementation, as many had been working as cultural advisors at the school for a significant length of time. They would have potentially been able to discuss the policy implementation process at the school as they observed it, from the beginning of policy development to its implementation, with knowledge of local First Nation culture, traditions, and health perspectives. It should be noted, however, that Elders were members of the ARC and were able to provide cultural insight into the data interpretation and alignment with the Cree Medicine Wheel. Another limitation is that data generation took place in only one community, so results may not be generalizable to other First Nations or to Indigenous communities in general. Instead, the results provide some insight into staff perspectives of the process of school nutrition policy implementation in one setting.

Discussion

This study explored school staff perceptions of factors that were potentially unique to school nutrition policy implementation at Kipohtakaw Education Centre in Alexander First Nation (Tagalik, 2010). When examined using the Medicine Wheel, the school quadrant had the most staff-perceived facilitating factors for policy implementation, which were administrative support, an environment that offered and encouraged healthy food choices, and previous health-oriented programming at the school. Similar factors have been identified by other researchers as
important for supporting school health policy (Assembly of First Nations, 2008; Lohrmann, 2010; Watts, Mâsse, & Naylor, 2014).

One of the highest-scoring facilitators of school nutrition policy implementation at the school was the many years of health programming that supported student and staff health initiatives that preceded the implementation of the policy. Many teachers had familiarity with the Alberta Project Promoting Active Living & health Eating (APPLE Schools; www.appleschools.ca), which is an evidence-based and cost-effective program to motivate change and transform the school environment to promote comprehensive school health. Alexander First Nation was the first on-reserve school in the province of Alberta to be an APPLE School. Through its engagement with University of Alberta researchers, the school had also participated in EarthBox Kids, which created gardens in school classrooms to promote healthy eating, vegetable and fruit consumption, and the delivery of nutrition education (Hanbazaza et al., 2015; Triador, Farmer, Maximova, Willows, & Kootenay, 2015). The nutrition policy was an extension of these and other school health initiatives. Unfortunately, there is disproportionately less funding per student for Indigenous schools compared to non-Indigenous schools in Canada (Drummond & Rosenbluth, 2013). Schools located in First Nation communities therefore often seek funding to support programs and services that schools located off reserve take for granted, and might not be able to support the type of health programming that has been implemented at Kipohtakaw Education Centre. These unique factors must be taken into account when considering the success of school policy implementation.

Another important facilitator was Kipohtakaw Education Centre’s central role as a support system and role model in the community of Alexander First Nation. The school provides a location for social gathering, learning, and positive role modelling. Staff discussed the school’s role as a model for community members in leading health initiatives and providing a place for nutritious food and physical activity opportunities. The important leadership role that staff members had, in terms of health and wellness initiatives in the community, enhanced school nutrition policy implementation by situating the policy in the larger context of community wellness. Staff members saw beyond the student impact of the policy and were able to understand the importance of the school nutrition policy in the broader community context.

It is important that students, as the primary target of the policy, are receptive to its tenets. A salient barrier to policy implementation noted by staff was that students preferred unhealthy foods, which may be related to students’ limited exposure to healthy foods, such that more time is needed for them to adapt to a changing food environment (Atik & Ertekin, 2013). Staff members provided a variety of explanations for the resistance to policy buy-in by students in higher grades, including older students having more freedom to purchase unhealthy snacks at the local convenience store. The home environment of many students may contain many unhealthy foods. Implementation of healthy food policies and practices in Alexander First Nation and other First Nation communities may be hindered by the high prevalence of food insecurity experienced by many First Nation households, meaning that families might not have physical or economic
access to healthy foods and are unable to serve their children healthy meals (Willows, Hanley, & Delormier, 2012).

The finding that staff considers the policy restrictive was a high-scoring barrier to implementation. Staff turnover at the school could change the salience of this barrier over time. The school administration has worked to educate staff members on the importance of healthy eating and has provided nutrition education curricula for teachers to implement in their classrooms. Based on the findings of the present study, the school nutrition policy was revised in February 2016 to provide staff members with a list of food items, including brand-name packaged foods, that are considered healthy choices for students. These actions are intended to reduce the number of staff members who feel restricted by the school nutrition policy.

A distinctively First Nation barrier to school nutrition policy implementation identified by staff was the perceived disparity between, on the one hand, the federal and provincial nutrition guidelines that were the basis of the policy at Kipohtakaw Education Centre that emphasized a low-saturated-fat diet (Jessri, Nishi, & L’Abbé, 2015) and, on the other, the nutritional quality of traditional First Nation foods served at cultural events in the community and school. These foods include bannock (a traditional Indigenous quick bread made of white flour, baking powder, salt, and a fat such as lard, margarine, or butter) and wild game of the region (e.g., moose, deer, rabbit, duck). Canadian scientific literature emphasizes the health benefits of consuming traditional unprocessed animal and plant foods harvested from the land, water, and air, as they are associated with better diet quality and higher vitamin and mineral intake (Downs et al., 2009; Kuhnlein & Receveur, 2007). First Nation Peoples value these foods because they connect them to their culture (Willows, 2005). Despite the scientific literature supporting the cultural and nutritional significance of traditional foods, staff members perceived that the traditional foods served at school cultural events were contradicting the school nutrition policy. While some traditional foods, such as bannock if made with white flour and lard, are unhealthy and not aligned with the school nutrition policy, game meat and healthy versions of bannock do not violate nutrition guidelines (Health Canada, 2007). This finding suggests that nutrition policies for First Nation schools need to specify healthy traditional food options for students, and that staff training about healthy traditional food options is needed. For example, it could be emphasized that game meat typically contains less saturated fat than meat from domesticated animals and that baked bannock made using whole wheat flour, berries, and vegetable oil is healthier than other versions (British Columbia Ministry of Forests, 2013).

**Conclusion**

Future longitudinal research to assess the progression of factors that affect school nutrition policy implementation over time may demonstrate that certain barriers diminish as the cycle of policy implementation occurs (Kyriakides, Creemers, Antoniou, Demetriou, & Charalambous, 2015). Barriers identified in the present study could be subject to substantial weakening or decline over time, such as staff inconsistency in policy implementation as staff
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Turnover occurs and more staff members implement the policy in their classrooms due to increased administrative support. More studies of First Nation communities in Canada that are implementing school health policies would provide additional direction in creating culturally relevant health policies (Gates, Skinner, & Gates, 2015).

The present study indicates that the school environment, inclusive of healthy food, staff support, and initiation by administration, is important for the effective implementation of healthy school policy. Foundational health programming that supports student and staff health initiatives as well as consistent encouragement of staff to promote healthy eating and the delivery of culturally appropriate nutrition education has been critical to the implementation of this First Nation school’s nutrition policy. APPLE Schools can draw on the results to inform supportive factors for policy implementation, strategies for reducing barriers, and insights into policy amendments that could serve to better implement First Nation school health policies.

References


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Appendix

Kipohtakaw Education Centre’s Nutrition and Physical Education Policy 126,
Implemented March 2014

Policy Statement: Kipohtakaw Education Centre will promote and provide nutritious snacks and meals consistent with the First Nation, Inuit, and Métis (FNIM) Food Guide while promoting nutrition education and daily physical activity.

Guidelines:

1. All Kipohtakaw Education Centre Staff must ensure that strategies are in place to foster the knowledge, skills and attitudes that promote healthy eating. In fulfilling this expectation Kipohtakaw Education Centre staff will:
   a) establish linkages between health education and foods available at the school,
   b) promote nutrition education and positive food messages provided by Alberta Health Services Website and Canadian FNMI food guide,
   c) limit the use of food items as rewards, e.g. no candy for cleaning desks or finishing work early.
   d) All school and classroom celebrations will follow the FNMI food guide and Alberta Health Services Guidelines for healthy living. (for example, talent show, round dance, pow wow, birthday parties, Halloween, meet the teacher, parent teacher interviews, Christmas concert, Christmas parties, career fair, graduation, track and field, prom, Easter, year-end parties, 100th day of school celebration and in addition to any other school celebrations).
   e) Hot lunch menu and canteen menu to be posted in the monthly newsletter.

2. Kipohtakaw Education Centre will promote healthy, reasonably priced food choices when food is sold or otherwise offered. In fulfilling this expectation, Kipohtakaw Education Centre Staff will plan to:
   a) access expertise in the community through partnerships, programs, referrals, etc.,
   b) offer foods that are from the FNMI Food Guide
   c) All fundraisers must follow the FNMI Food Guide and Alberta Health Services guidelines for healthy living.

3. Kipohtakaw Education Centre school community will examine their nutrition practices and provide opportunities, support and encouragement for staff and students to eat healthy foods. In fulfilling this expectation staff may do things such as:
   a) create their own health and wellness team that includes staff, parents and students
   b) choose healthy fundraising options
   c) create an environment where healthy foods are available, affordable and promoted as the best choice,
   d) review options with food suppliers to maximize the nutritional value of the items
   e) define the frequency of special celebrations in yearly calendars and ensure that healthy food items are available on those days
   f) will promote positive food messaging on lunch and snack items provided by parents (Kipohtakaw Education Centre staff are not responsible for unhealthy food choices brought from home)

4. Physical Activity. In addition to regularly scheduled physical education programming, Kipohtakaw Education Centre will provide opportunities for additional daily physical activity e.g. Daily Physical Activity (DPA) Bins, extracurricular sporting events, running club, energizers, etc. either within classroom time or outside of classroom time.
The Relationship Between Bias-Related Victimization and Generalized Anxiety Disorder Among American Indian and Alaska Native Lesbian, Gay, Bisexual, Transgender, Two-Spirit Community Members • Myra Parker, Bonnie Duran, Karina Walters • DOI:10.18357/ijih122201717785

Abstract
Lesbian, gay, bisexual, transgender, two-spirit, and American Indian and Alaska Native community members share long histories of discrimination and poorer health status as compared to mainstream Americans. In particular, these groups experience bias-related victimization, a type of discrimination based on inherent traits such as race or ethnicity and sexual orientation. This cross-sectional study (N = 334) used a revised bias-related victimization measure and examined the relationship between self-reported bias-related victimization and generalized anxiety disorder, depression, and substance abuse among lesbian, gay, bisexual, transgender, and two-spirit American Indians and Alaska Natives. The results showed that 84.4% reported experiencing bias-related victimization. Those with the highest levels of bias-related victimization had 2.79 times ($p = .009; 95\% \text{ CI} [1.30, 6.02]$) the risk of reporting symptoms of generalized anxiety disorder as compared to those with no bias-related victimization, controlling for income, education, sex, age, sexual orientation, and chronic disease. There was no significant relationship between bias-related victimization and major depression or substance dependence/abuse. Our results support a potential relationship between bias-related victimization and generalized anxiety disorder for lesbian, gay, bisexual, transgender, and two-spirit American Indians and Alaska Natives. Including diverse populations in research is essential to a better understanding of the impact on health outcomes. Inclusion of bias-related victimization questions in clinical treatment may help identify at-risk patients.

Keywords
Discrimination, health disparities, American Indians, LGBT, generalized anxiety disorder, substance abuse, two-spirit

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Introduction

Anxiety disorders are the most common type of mental illness in the United States, with 40 million (18.1%) of the adult U.S. population (age 18 and older) affected (McLean, Asnaani, Litz, & Hofmann, 2011). Anxiety disorders cost the United States more than $42 billion a year in 1990—almost one third of the $148 billion total mental health bill (Hoffman, Dukes, & Wittchen, 2008). Women are twice as likely as men to experience generalized anxiety disorder (McLean et al., 2011). The American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (5th ed., 2013) defines generalized anxiety disorder as including excessive anxiety and worry about several events or activities most days of the week for at least six months; difficulty controlling feelings of worry; at least three symptoms out of a list comprising restlessness, fatigue, trouble concentrating, irritability, muscle tension, and sleep problems; anxiety or worry that causes significant distress or interferes with daily life; and anxiety that isn’t related to another mental health condition, such as panic attacks or post-traumatic stress disorder (PTSD), or to substance abuse or a medical condition (American Psychiatric Association, 2013).

Many individuals with anxiety disorders experience comorbid conditions, including depression, bipolar disorder, and other mental and physical illnesses (McLean et al., 2011). The cross-sectional analysis presented in this paper provides a first look at anxiety disorders in a “minority within a minority”: lesbian, gay, bisexual, transgender, and two-spirit (LGBTT-S) people in American Indian and Alaska Native (AI/AN) urban communities. American Indian and Alaska Native are terms adopted by the United States, used in law and policy to refer to the 566 federally recognized tribal populations across the United States. Many AI/ANs prefer to identify by tribal affiliation. Two-spirit is a contemporary pan-Indian umbrella term for AI/AN LGBTQ, adopted by some in the 1980s, and with which some AI/AN tribes identify but others view with negative connotations. Other individual two-spirit AI/ANs adopt the term as a way to recognize the confluence of culture and sexual orientation. While these identity characteristics can vary by individual and by tribe, it may be possible to measure the ways in which dominant mainstream society views and treats these racial, gender identity, and sexual orientation minorities. Because each social location, specifically sexual orientation/gender identity and racial/ethnic identity, is acknowledged to experience more discrimination and violence than their heterosexual counterparts and non-AI/AN counterparts, the combination of the two, the intersectionality of identities, presents an important case for better understanding the relationship between bias-related victimization (BRV), a set of discrimination practices experienced by members of minority communities, and mental health outcomes.
Historical Context

Among LGBT-T-S populations, discrimination has long been reported as higher than for non-LGBT individuals. AI/ANs also experience higher levels of discrimination than white Americans, and American Indians are more than twice as likely to be victim of a violent crime as other races (Perry, 2004). These present-day experiences of discrimination have their roots in historical practices as well as laws and policies deliberately targeting AI/AN and LGBT-T-S community members. With the advent of colonization, AI/ANs were first seen as barbaric, and during the Darwinian era of the late 1800s, Darwin and others applied the theory of natural selection to humans, categorizing AI/ANs as subhuman (Pessah, 2014; “Who Are,” 1889). The United States’ Manifest Destiny doctrine, the belief that the country was justified in expanding its territory to the Pacific Ocean, led to policies in the 1800s that were catastrophic for AI/ANs, with entire tribes decimated through exposure to disease or through armed conflict, and tribal ways of life so curtailed that tribal knowledge and cultures were damaged irreparably. The reservation era of the late 19th and early 20th centuries, during which the United States relegated AI/ANs to tightly controlled and limited parcels of diminishing areas of land, and the process of land acquisition to create the western United States’ territories brought with it policies intended to extinguish tribal cultures. Laws and policies allowed sale or seizure of millions of acres of tribal lands to the U.S. government or to non-Indians (Harmon, 2003; Miller, 2010), banned spiritual practices, required that AI/AN families turn their children over to strangers to be sent away to boarding schools hundreds of miles from home, prohibited traditional livelihoods, and introduced western European dietary staples.

In the early 1900s AI/ANs saw few improvements in their conditions, with extreme poverty, poor or nonexistent healthcare despite treaty guarantees, and ways of life gone or dwindling as a result of the previous century of abuse and disenfranchisement (Treglia, 2013). While AI/ANs were recognized as U.S. citizens in 1924, many tribal members lived within islands of poverty, with Jim Crow–style policies—such as banning AI/ANs from non-Indian places of business, requiring AI/ANs to use different bathrooms and drinking fountains, and refusing to provide local government services to tribal communities—continuing well into the 1960s and 1970s (Steinman, 2012). Indeed, tribal members in Arizona, Maine, New Mexico, and Utah were not allowed to vote until 1948, 1954, 1957, and 1962, respectively. Alongside these discriminatory practices and through the 1980s, tribal assertion of guaranteed treaty rights such as hunting, gathering, and fishing led to additional confrontation with local non-Indian communities who still believed Indian reservations should be eliminated and the lands made available to the general public (Steinman, 2012).

Prior to European contact, many tribes viewed tribal members who identified as LGBT-T-S as having an important status, with perhaps skills and medicine to help others (Sheppard & Mayo, 2013). This is in contrast with the long history of discrimination non-Indian LGBT-T-S community members faced. For hundreds of years, strict interpretation of many religious texts has barred and devalued same-sex relationships (Hurewitz, 2004; Wilkinson & Pearson, 2009). In 1930s Germany, LGBT-T-S community members were singled out alongside Jews and
Gypsies as targeted groups for hatred, and forms of abuse based on sexual orientation included “re-education,” castration, and imprisonment (Heineman, 2002).

Only in 2003 did the U.S. Supreme Court reverse a previous court decision upholding state same-sex sodomy laws, which had previously made engaging in same-sex intercourse a felony in 14 states (Rosenbaum & Burke, 2003). In 2015 the U.S. Supreme Court ruled that states must license and uphold same-sex marriages, guaranteeing same-sex couples the same rights as heterosexual couples.

In 2009 the U.S. Congress passed the Matthew Shepard and James Byrd, Jr. Hate Crimes Prevention Act, expanding the 1969 federal hate crime law to include crimes motivated by the victim’s actual or perceived gender, sexual orientation, gender identity, or disability and ensuring federal law enforcement has greater authority and funding to investigate possible hate crimes that local law enforcement fails to pursue. This law also ensures that the Federal Bureau of Investigation tracks hate crimes based on gender and gender identity. However, what is the impact of discriminatory practices that do not rise to the level of a hate crime? How do members of multiple minority communities understand the discrimination they experience, and what health impact does this have?

Even with these 21st-century rulings, LGBTT-S community members continue to receive discriminatory treatment at multiple levels across society (Landers, 2015). Ongoing hatred and mistreatment of AI/ANs means that these citizens are more likely to be victims of violent crime from white Americans, African Americans, and other races than from members of their own group (Perry, 2004). The combined historical and present-day conditions have led to extreme poverty and ongoing discrimination for AI/ANs, fostering conditions such as generalized anxiety, as well as other behavioral and social problems.

**Research Context**

Trauma and interpersonal violence are associated with higher levels of anxiety and depression in AI/AN individuals compared to non-AI/AN individuals (Evans-Campbell, 2008; Evans-Campbell, Lindhorst, Huang, & Walters, 2006). Of respondents in the American Indian Service Utilization, Psychiatric Epidemiology, Risk and Protective Factors Project (AI-SUPERPFP), 17.4% reported some type of anxiety disorder in their lifetime (Beals et al., 2005). One study found that AI/AN LGBTT-S respondents had higher rates of depression and anxiety than their heterosexual counterparts (Balsam, Huang, Fieland, Simoni, & Walters, 2004).

In a study of perceived discrimination among lesbian, gay, and bisexual adults, Mays and Cochran (2001) reported a discrimination experience rate of 76% as compared to 65% in heterosexuals. Discrimination was positively associated with a diagnosis of any psychiatric disorder ($OR = 1.6$; Mays & Cochran, 2001). Heidt, Marx, and Gold (2005) found that 63% of lesbian, gay, and bisexual men and women had experienced some form of sexual violence and that sexual violence was associated with an increased risk of depression and PTSD. Herek, Gillis, and Cogan (1999) and Hershberger and D’Augelli (1995) also confirmed that gay-related harassment and physical abuse was associated with depression, anxiety, and other mental health issues.
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problems. While Morris and Balsam (2003) found that AI/AN respondents experienced higher levels of victimization than other races, and Williams, Mohammed, Leavell, and Collins (2010) have summarized the evidence of a differential in the prevalence of mental health issues across racial groups, more research within the AI/AN LGBTT-S community is needed to understand the unique risk factors these community members face.

More studies have begun to focus on AI/AN LGBTT-S, demonstrating that individuals within this group experience significantly higher risk for suicidality, alcohol problems, and drug use if they have boarding school experience (Evans-Campbell, Walters, Pearson, & Campbell, 2012); are more likely to use tobacco at higher rates and report lower self-rated health if they experience more pain (Chae & Walters, 2009); and report higher rates of childhood physical abuse, more familial historical trauma, higher levels of depression, more drug and alcohol use, and more mental health service use than heterosexual AI/ANs (Balsam et al., 2004). The present study is based on secondary data from the Honor Project, one of the first research studies to address the lack of focus on discrimination and mental health within AI/AN LGBTT-S communities (see Methods).

The theory of intersectionality recognizes that different forms of discrimination compound and exacerbate each other across historically disenfranchised groups, such that their experience is that of the “multiple minority” (Balsam et al., 2004). The presence of multiple causal factors makes it difficult to disambiguate and separate the causal factors of generalized anxiety in AI/AN LGBTT-S populations. Intersectionality theory posits that the experiences of AI/AN LGBTT-S will be qualitatively different from those of the general LGBT population, and just as qualitatively different from the experiences of the general AI/AN population. Thus, public health studies based on LGBT populations alone or AI/AN populations alone and applied to AI/AN LGBTT-S groups will only partially address the multiple factors at play. By contrast, more holistic studies that take into consideration the intersectionality of the AI/AN LGBTT-S population could provide a much more complete description of what is being observed.

We hypothesized that experience with BRV is associated with report of mental health problems. Determining whether an association between BRV and major depression, generalized anxiety disorder, or substance dependence/abuse exists could help to improve health status for an at-risk minority group through increased access to care, enhanced health assessments, and more comprehensive care, as well as provide public health support for implementation of meaningful anti-discrimination laws and policies. For example, the CDC (Centers for Disease Control and Prevention) provides a racial discrimination optional module in the Behavioral Risk Factor Surveillance Survey, but few states implement this module (Blosnich & Bossarte, 2009).

This study tests one assessment of bias-related victimization with self-reported mental health and substance dependence/abuse outcomes to begin understanding how to measure the effect of bias-related victimization, and how to identify the risks associated with exposure to BRV for those who are members of two groups subject to historic and present-day violence and discrimination. Our specific aims are to (a) describe the prevalence of BRV, mental health, and
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substance abuse problems in AI/ANs identifying as LGBTT-S; and (b) examine the association of BRV with mental health and substance abuse problems, controlling for covariates.

Methods

This study focuses on a secondary data analysis from the Honor Project, a study of LGBTT-S American Indians and Alaska Natives. The Honor Project sampling methods have been described elsewhere (Chae & Walters, 2009). In brief, 447 AI/AN respondents were recruited through targeted, partial-network, and respondent-driven sampling techniques from seven urban areas: Seattle-Tacoma, San Francisco-Oakland, Los Angeles, Denver, Tulsa, Minneapolis-St. Paul, and New York City. To be eligible, respondents were required to (a) be enrolled in a tribe or report a minimum of 25% American Indian blood; (b) self-identify as lesbian, gay, bisexual, two-spirit, or engaging in same-sex sexual behaviors in the past 12 months; (c) be 18 years or older; (d) speak English; and (e) reside, work, or socialize in the area of the study sites. Written informed consent was obtained from all subjects upon determining study eligibility. The project achieved an 80.1% response rate across the three recruiting methods, and 451 respondents were interviewed between July 2005 and March 2007. Four respondents did not meet eligibility criteria and were excluded. Respondents received $65 for completing a 3- to 4-hour computer-assisted interview. Respondents also received $10 for each referral to the study.

The Honor Project obtained institutional review board approval from the University of Washington. The secondary data analysis conducted in this study also obtained University of Washington institutional review board approval and, subsequently, a determination of exemption from review.

Our conceptual model is based on the theory that personal characteristics (race, sex identity, sexual orientation) engender external responses that may negatively affect an individual’s mental and/or physical health. Bias-related victimization (BRV) attempts to measure the “exposure” of these deleterious environmental responses and is the independent variable in this analysis. Assessments for major depression, generalized anxiety disorder, and substance abuse are the dependent variables.

Bias-Related Victimization

The Honor Project survey included nine questions assessing BRV derived from previous studies on LGBT populations and hate crimes (Herek et al., 1999; Hershberger & D’Augelli, 1995). The questions were as follows:

Have you ever in your life experienced any of the following:

(1) You were threatened with physical violence;
(2) You were verbally harassed or verbally attacked;
(3) You were chased, followed, or stalked;
(4) Your property was purposely damaged or vandalized;
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(5) Your property was stolen, as in a break-in, burglary, or theft;
(6) You were robbed, as in a hold-up or mugging;
(7) You were punched, kicked, hit, or beaten;
(8) You were assaulted with a weapon;
(9) You were raped or sexually assaulted.

We ranked the nine bias-related victimization questions into low to moderate BRV (Questions 1–6) and severe BRV (Questions 7–9) using a scheme borrowed from the Conflict Tactics Scale, an assessment used in partner and family violence (Morse, 1995). We then created a categorical variable that included three categories: no BRV (coded 0), low to moderate BRV (coded 1), and severe BRV (coded 2). Due to a faulty skip pattern in some of the computers used, 111 respondents were never asked the BRV questions, and two respondents skipped the question on rape/sexual assault, resulting in a final sample size of $N = 334$.

Dependent Variables

We were interested in associations between BRV and major depression, generalized anxiety, and substance dependence/abuse. Major depression was assessed through the Center for Epidemiologic Studies Depression scale (CES-D; Roberts, 1980). Generalized anxiety and alcohol/drug dependence and abuse were assessed through the Mini-International Neuropsychiatric Interview (M.I.N.I.) 5.0.0/English Version/DSM-IV 11/1/03 (Sheehan et al., 1998).

Demographic Characteristics

Sex, age, sexual orientation/gender identity, education, monthly household income, and number of chronic diseases (i.e., diabetes, hypertension, cancer, arthritis) were used as covariates.

Missing Data

Missing data were limited to three responses on age and three on income. Multiple imputation was used to impute these six values.

Analyses

Descriptive statistics were analyzed based on BRV status. Bivariate statistical tests were performed to determine whether personal characteristics were significantly different across the nine BRV groups. Three regression models were explored. First, logistic regression was used to examine an association between major depression and BRV, controlling for covariates. Major depression was dichotomized into yes (coded as 1) and no (coded as 0). Next, logistic regression was employed to examine an association between generalized anxiety disorder and BRV, controlling for covariates. Generalized anxiety disorder was dichotomized into yes (coded as 1) and no (coded as 0). Finally, we used logistic regression to examine the association between substance dependence/abuse and BRV groups, controlling for covariates. Substance
dependence/abuse included both alcohol and drugs and was dichotomized into yes (coded as 1) and no (coded as 0). We analyzed data with Stata/SE Version 11.0 (StataCorp LP, College Station, TX).

Results

Demographic Characteristics

The average age was 37 for no-BRV respondents and 40 for BRV respondents (Table 1), with a trend of younger respondents among those with no-BRV ($p = .05$). Of the no-BRV respondents, 69% were men and 31% were women. In comparison, of BRV respondents, 57% were men and 43% were women. Of the no-BRV respondents 50% reported lesbian or gay sexual orientation status compared with 55% of BRV respondents. Of the no-BRV respondents, 29% reported bisexual status compared with 22% of BRV respondents, 14% reported two-spirit status compared with 19% of BRV respondents, and 8% reported other sexual orientation/gender identity status compared with 4% of BRV respondents.

Respondents indicated low levels of education; approximately 75% had not attained a college degree. Those reporting no-BRV also reported significantly lower education levels ($p = .01$). Almost half (48%) of respondents reported a household income of equal to or less than $12,000 per year. About 70% of respondents indicated they have a stable housing status, with approximately 25% having an unstable status and about 6% transient. Just under one quarter (23%) of no-BRV respondents reported having at least one of the four most common chronic diseases in the study (i.e., arthritis, cancer, diabetes, or hypertension), compared to 41% of BRV respondents ($p = .01$).

Independent Variable

Bias-related victimization. Most respondents (84.4% of 334) reported experiencing some form of bias-related victimization. The frequencies of different types of abuse were as follows:

- The most common was verbal harassment or verbal attack, reported by 72% of the respondents.
- 60% of respondents reported being threatened with physical violence.
- 55% reported being punched, kicked, hit, or beaten.
- 49% indicated they had been raped or sexually assaulted.
- 48% reported they had been chased, followed, or stalked.
- 47% reported having property stolen as through a break-in, burglary, or theft.
- 40% indicated that their property had been purposely damaged or vandalized.
- 34% had been assaulted with a weapon.
- 30% had been robbed, as in a hold-up or mugging.
Table 1

Demographic Characteristics of American Indian and Alaska Native Honor Project Respondents (N = 334) Without and With Bias-Related Victimization (BRV)

<table>
<thead>
<tr>
<th>Factor</th>
<th>No BRV (n = 52)</th>
<th>%</th>
<th>BRV (n = 282)</th>
<th>%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>36</td>
<td>69.2</td>
<td>162</td>
<td>57.4</td>
<td>.11</td>
</tr>
<tr>
<td>Women</td>
<td>16</td>
<td>30.8</td>
<td>120</td>
<td>42.6</td>
<td></td>
</tr>
<tr>
<td><strong>Age, mean (SD)</strong></td>
<td>36.9 (10.1)</td>
<td></td>
<td>40.2 (11.1)</td>
<td></td>
<td>.05</td>
</tr>
<tr>
<td><strong>Age groups</strong></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>18–29</td>
<td>14</td>
<td>26.9</td>
<td>56</td>
<td>19.9</td>
<td>.22</td>
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<tr>
<td>30–39</td>
<td>17</td>
<td>32.7</td>
<td>78</td>
<td>27.7</td>
<td></td>
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<tr>
<td>40–49</td>
<td>16</td>
<td>30.8</td>
<td>89</td>
<td>31.6</td>
<td></td>
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<tr>
<td>50+</td>
<td>5</td>
<td>9.6</td>
<td>59</td>
<td>20.9</td>
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<tr>
<td><strong>Sexual orientation / gender identity</strong></td>
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<tr>
<td>Lesbian/gay</td>
<td>26</td>
<td>50.0</td>
<td>156</td>
<td>55.3</td>
<td>.30</td>
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<tr>
<td>Bisexual</td>
<td>15</td>
<td>28.8</td>
<td>62</td>
<td>22.0</td>
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<tr>
<td>Two-spirit</td>
<td>7</td>
<td>13.5</td>
<td>54</td>
<td>19.1</td>
<td></td>
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<tr>
<td>Other</td>
<td>4</td>
<td>7.7</td>
<td>10</td>
<td>3.5</td>
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<td><strong>Education</strong></td>
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<tr>
<td>Less than high school</td>
<td>10</td>
<td>19.2</td>
<td>33</td>
<td>11.7</td>
<td>.01</td>
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<tr>
<td>High school</td>
<td>21</td>
<td>40.4</td>
<td>67</td>
<td>23.8</td>
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<tr>
<td>Some college</td>
<td>14</td>
<td>26.9</td>
<td>105</td>
<td>37.2</td>
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<tr>
<td>Bachelor’s degree or higher</td>
<td>7</td>
<td>13.5</td>
<td>77</td>
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<tr>
<td><strong>Household income per month</strong></td>
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<tr>
<td>0–$1,000</td>
<td>27</td>
<td>51.9</td>
<td>133</td>
<td>47.2</td>
<td>.29</td>
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<tr>
<td>$1,001–$2,000</td>
<td>13</td>
<td>25.0</td>
<td>54</td>
<td>19.1</td>
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<tr>
<td>$2,001+</td>
<td>12</td>
<td>23.1</td>
<td>95</td>
<td>33.7</td>
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<tr>
<td><strong>Chronic disease</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>No</td>
<td>40</td>
<td>76.9</td>
<td>166</td>
<td>58.9</td>
<td>.01</td>
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<tr>
<td>Yes</td>
<td>12</td>
<td>23.1</td>
<td>116</td>
<td>41.1</td>
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</tr>
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</table>

*a Chronic disease is a composite of any diabetes, arthritis, hypertension, or cancer.

**Dependent Variables**

**Mental health.** The mean CESD total score for no-BRV respondents was 12.4 (SD = 5.4) as compared with 13.4 (SD = 5.8) for BRV respondents. Just under one quarter (23%) of no-
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BRV respondents were classified as having major depression compared with 36% of BRV respondents; this difference was not statistically significant (Table 2). On the whole, those reporting any BRV experience had significantly higher levels of generalized anxiety disorder; 43% of BRV respondents were classified as having generalized anxiety disorder compared with 23% of no-BRV respondents, a statistically significant difference. The mean M.I.N.I. generalized anxiety score for no-BRV respondents was 0.3 (SD = 0.4) as compared with 0.5 (SD = 0.4) for BRV respondents. Total PTSD classification was low (n = 20), but only one person in the no-BRV group was classified as having PTSD as compared to 19 in the BRV group.

**Substance dependence and abuse.** Substance dependence and abuse did not significantly differ in the no-BRV group (48%) compared to the BRV group (51%; Table 2).

**Table 2**

*Mental Health Characteristics of American Indian and Alaska Native Honor Project Respondents (N = 334) Without and With Bias-Related Victimization (BRV)*

<table>
<thead>
<tr>
<th>Mental health problem</th>
<th>No BRV</th>
<th>BRV</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (n = 52)</td>
<td>%</td>
<td>No. (n = 282)</td>
</tr>
<tr>
<td>Major depression status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not depressed</td>
<td>40</td>
<td>76.9</td>
<td>182</td>
</tr>
<tr>
<td>Major depression</td>
<td>12</td>
<td>23.1</td>
<td>100</td>
</tr>
<tr>
<td>Generalized anxiety disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>40</td>
<td>76.9</td>
<td>161</td>
</tr>
<tr>
<td>Yes</td>
<td>12</td>
<td>23.1</td>
<td>121</td>
</tr>
<tr>
<td>Any substance dependence/abuse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>51.9</td>
<td>137</td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
<td>48.1</td>
<td>144</td>
</tr>
</tbody>
</table>

**Logistic Regression Results**

*Any mental health outcome and substance dependence and abuse and BRV.* Table 3 provides the results of the unadjusted and adjusted logistic regression results predicting any mental health or substance issue from BRV status. Those experiencing severe BRV had twice the risk (p = .04) of exhibiting some mental health or substance dependence or abuse than those with no BRV, controlling for income, education, sex, age, sexual orientation/gender identity, and chronic disease. Two of these were statistically significant in the model: income and age. For every one unit increase in income, the odds of reporting mental health or substance abuse problems increased by 0.64 (p = .001). For every 1-year increase in age, the odds of reporting any mental health or substance abuse problem increased by 0.74 (p = .04).
The Relationship Between Bias-Related Victimization and Generalized Anxiety Disorder Among American Indian and Alaska Native Lesbian, Gay, Bisexual, Transgender, Two-Spirit Community Members • Myra Parker, Bonnie Duran, Karina Walters • DOI:10.18357/ijih12201717785

Table 3
*Unadjusted and Adjusted Odds Ratio (PR) From Logistic Regression Analyses Predicting Any Mental Health Issue or Substance Abuse Status from Bias-Related Victimization*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unadjusted PR [95% CI], p</th>
<th>Adjusted PR [95% CI], p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bias-related victimization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Low to moderate</td>
<td>1.09 [0.48, 2.46], .84</td>
<td>1.67 [0.65, 4.31], .29</td>
</tr>
<tr>
<td>Severe</td>
<td>1.53 [0.81, 2.92], .19</td>
<td>2.09 [1.03, 4.25], .04</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>1.62 [0.58, 4.47], .36</td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>0.76 [0.29, 1.97], .57</td>
<td></td>
</tr>
<tr>
<td>College or more</td>
<td>0.51 [0.18, 1.41], .20</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>0.89 [0.50, 1.56], .68</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.74 [0.55, 0.98], .04</td>
<td></td>
</tr>
<tr>
<td>Sexual orientation / gender identity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesbian/gay</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bisexual</td>
<td>1.17 [0.57, 2.40], .67</td>
<td></td>
</tr>
<tr>
<td>Two-spirit</td>
<td>1.53 [0.74, 3.16], .26</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0.95 [0.27, 3.38], .94</td>
<td></td>
</tr>
<tr>
<td>Chronic disease</td>
<td>1.53 [0.83, 2.82], .17</td>
<td></td>
</tr>
</tbody>
</table>

*a* Low to moderate bias-related victimization includes: being threatened with physical violence; being verbally harassed or verbally attacked; being chased, followed, or stalked; having property purposely damaged or vandalized; having property stolen, as in a break-in, burglary or theft; being robbed, as in a holdup or mugging.

*b* Severe bias-related victimization includes: being punched, hit, kicked, or beaten; being assaulted with a weapon; being raped or sexually assaulted.

**Depression and BRV.** Table 4 provides the results of the logistic regressions predicting major depression from BRV status. The variables that were considered for the model were sex, age, sexual orientation/gender identity, education, household income per month, and some chronic disease. Three of these were statistically significant in the adjusted model: income, education, and presence of chronic disease. The logistic results are very similar between the unadjusted and adjusted models—there is no significant difference in the odds of a participant having depression across levels of BRV. We further found that higher income and education status were associated with an increase in odds of depression. For those who received a college education or higher, the odds of reporting symptoms of major depression increased by 0.31
compared to those with less than a high school education ($p = .03$). Presence of a chronic disease (i.e., arthritis, cancer, diabetes, or hypertension) was associated with an increase in the odds that a person could be classified as having depression by a factor of 1.77 ($p = .029$).

**Table 4**

*Unadjusted and Adjusted Prevalence Ratio (PR) From Logistic Regression Analyses Predicting Major Depression Status From Bias-Related Victimization*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unadjusted PR [95% CI], $p$</th>
<th>Adjusted PR [95% CI], $p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bias-related victimization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Low to moderate $^a$</td>
<td>0.66 [0.30, 1.47], .31</td>
<td>0.78 [0.33, 1.81], .56</td>
</tr>
<tr>
<td>Severe $^b$</td>
<td>1.13 [0.61, 2.07], .70</td>
<td>1.09 [0.57, 2.11], .79</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>0.57 [0.26, 1.23], .15</td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>0.48 [0.23, 1.04], .06</td>
<td></td>
</tr>
<tr>
<td>College or more</td>
<td>0.31 [0.13, 0.77], .03</td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesbian/gay</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bisexual</td>
<td>0.92 [0.51, 1.66], .78</td>
<td></td>
</tr>
<tr>
<td>Two-spirit</td>
<td>1.09 [0.56, 2.10], .80</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2.05 [0.68, 6.16], .20</td>
<td></td>
</tr>
<tr>
<td><strong>Chronic disease</strong></td>
<td>1.77 [1.06, 2.96], .03</td>
<td></td>
</tr>
</tbody>
</table>

$^a$ Low to moderate bias-related victimization includes: being threatened with physical violence; being verbally harassed or verbally attacked; being chased, followed, or stalked; having property purposely damaged or vandalized; having property stolen, as in a break-in, burglary or theft; being robbed, as in a holdup or mugging.

$^b$ Severe bias-related victimization includes: being punched, hit, kicked, or beaten; being assaulted with a weapon; being raped or sexually assaulted.

**Generalized anxiety and BRV.** Table 5 provides the results of the logistic regressions predicting generalized anxiety from BRV status. We found a significant association between generalized anxiety disorder status and BRV in both the unadjusted and adjusted models. In the unadjusted model, for those with severe BRV exposure the odds of exhibiting generalized anxiety disorder symptoms were 2.6 times ($p = .007$) the odds for those with no BRV, compared
with 2.79 times ($p = .009$) in the adjusted model. For those reporting low to moderate BRV in the adjusted model, the odds of reporting symptoms of generalized anxiety increased by 2.56 as compared to those without BRV exposure ($p = .05$). For those identifying as bisexual or two-spirit, the odds of reporting symptoms of generalized anxiety increased by 1.87 ($p = .05$) and 2.09 ($p = .03$), respectively, as compared to those who identified as lesbian or gay.

**Table 5**

*Unadjusted and Adjusted Prevalence Ratio (PR) From Logistic Regression Analyses Predicting Generalized Anxiety Status From Bias-Related Victimization*

<table>
<thead>
<tr>
<th>Generalized anxiety (N = 334)</th>
<th>Unadjusted PR [95% CI], $p$</th>
<th>Adjusted PR [95% CI], $p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bias-related victimization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Low to moderate $^a$</td>
<td>2.08 [0.89, 4.90], .09</td>
<td>2.56 [0.99, 6.65], .05</td>
</tr>
<tr>
<td>Severe $^b$</td>
<td>2.61 [1.30, 6.02], .01</td>
<td>2.79 [1.30, 6.02], .01</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td></td>
<td>1.84 [0.81, 4.18], .14</td>
</tr>
<tr>
<td>Some college</td>
<td></td>
<td>1.15 [0.52, 2.55], .74</td>
</tr>
<tr>
<td>College or more</td>
<td></td>
<td>1.95 [0.79, 4.81], .15</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesbian/gay</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bisexual</td>
<td></td>
<td>1.87 [1.01, 3.45], .05</td>
</tr>
<tr>
<td>Two-spirit</td>
<td></td>
<td>2.09 [1.09, 4.01], .03</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>3.12 [0.94, 10.37], .06</td>
</tr>
<tr>
<td><strong>Chronic disease</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.45 [0.86, 2.45], .16</td>
<td></td>
</tr>
</tbody>
</table>

$^a$ Low to moderate bias-related victimization includes: being threatened with physical violence; being verbally harassed or verbally attacked; being chased, followed, or stalked; having property purposely damaged or vandalized; having property stolen, as in a break-in, burglary or theft; being robbed, as in a holdup or mugging.

$^b$ Severe bias-related victimization includes: being punched, hit, kicked, or beaten; being assaulted with a weapon; being raped or sexually assaulted.

**Any substance abuse or dependence and BRV.** Table 6 provides the results of the logistic regressions predicting any substance abuse or dependence from BRV status. We did not find a significant association between any substance abuse or dependence and BRV in either the
unadjusted or adjusted models. However, we did see a significant increase in the odds of reporting substance abuse or dependence of 0.75 \( (p = .02) \) for every one unit increase in income; of 0.39 \( (p = .05) \) for those completing a college education or higher as compared to those with less than a high school education; of 0.54 \( (p = .02) \) for women compared to men, and of 0.74 \( (p = .02) \) for every one unit increase in age.

**Table 6**

*Unadjusted and Adjusted Prevalence Ratio (PR) From Logistic Regression Analyses Predicting Substance Abuse or Dependence Status From Bias-Related Victimization*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Unadjusted PR [95% CI], ( p )</th>
<th>Adjusted PR [95% CI], ( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bias-related victimization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Low-moderate (^a)</td>
<td>1.26 [0.58, 2.72], .56</td>
<td>1.96 [0.79, 4.84], .15</td>
</tr>
<tr>
<td>Severe (^b)</td>
<td>1.12 [0.62, 2.04], .72</td>
<td>1.81 [0.90, 3.64], .09</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>1.42 [0.61, 3.34], .42</td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>0.44 [0.19, 1.02], .06</td>
<td></td>
</tr>
<tr>
<td>College or more</td>
<td>0.39 [0.16, 0.98], .05</td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesbian/gay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bisexual</td>
<td>0.91 [0.47, 1.75], .78</td>
<td></td>
</tr>
<tr>
<td>Two-spirit</td>
<td>0.84 [0.44, 1.61], .60</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0.54 [0.17, 1.65], .28</td>
<td></td>
</tr>
<tr>
<td><strong>Chronic disease</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.03 [0.61, 1.74], .93</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Low to moderate bias-related victimization includes: being threatened with physical violence; being verbally harassed or verbally attacked; being chased, followed, or stalked; having property purposely damaged or vandalized; having property stolen, as in a break-in, burglary or theft; being robbed, as in a holdup or mugging.

\(^b\) Severe bias-related victimization includes: being punched, hit, kicked, or beaten; being assaulted with a weapon; being raped or sexually assaulted.
Discussion

The Honor Project study is the first effort to comprehensively examine health and wellness within AI/AN LGBTT-S communities. This paper brings into focus a population segment that experiences discrimination based on race and sexual orientation/gender identity, occurring simultaneously due to the population’s inherent personal characteristics (Perry, Harp, & Oser, 2013). This sample suffers higher levels of depression, generalized anxiety, and violence than the broader U.S. population. These findings confirm previous research on AI/AN and LGBTT-S communities (Balsam et al., 2004; Beals et al., 2005; Simoni, Walters, Balsam, & Meyers, 2006) and demonstrate the relationship of a violence construct—severity—on mental health and substance abuse outcomes. In this study the most severe exposure to bias-related victimization is associated with higher odds of generalized anxiety disorder in AI/AN LGBTT-S respondents. We also saw that for those reporting severe BRV, the odds of reporting any depression, generalized anxiety, or substance dependence/abuse outcomes were significantly higher than for those reporting no BRV.

Interestingly, above and beyond the additional risk presented by BRV exposure, the odds of reporting symptoms of major depression, generalized anxiety, or substance dependence/abuse problems was also significantly higher for those with higher incomes, and for some outcomes (i.e., major depression and substance abuse) the odds were higher for those who completed college or higher levels of education. These findings confirm recent studies demonstrating higher risk for minority groups with higher income and education levels (Garnett et al., 2014; Seng, Lopez, Sperlich, Hamama, & Meldrum, 2012), suggesting that perhaps the additional stressors associated with these achievements may be greater for sexual, racial, and ethnic minorities, or perhaps these groups tend to identify the disparities in discrimination to which they are subject more readily. We further saw increased odds of reporting generalized anxiety symptoms among those identifying as bisexual or two-spirit, suggesting that people who identify in these ways experience greater risks. In addition, the odds of reporting substance dependence/abuse symptoms were higher for women as compared to men. This study reinforces the importance of investigating factors associated with mental health outcomes for these at-risk communities, paying particular attention to intersectionality theory in establishing the scope of the research.

The existing literature points toward two other important constructs that could provide additional insight into the victimization experienced in these communities: frequency of victimization (Poteat, et al., 2012) and the respondent’s perception of why he or she was the target of these types of violence (Doyle & Molex, 2014). Frequencies of exposure to the nine types of victimization could provide important additional information on the effect of victimization on AI/AN LGBTT-S health outcomes. For example, one hypothesis that requires additional exploration is whether higher frequency of exposure to victimization (low or high) is associated with mental health or substance abuse outcomes. In addition, the effect of the respondent’s perception of why he or she was the target of victimization (e.g., whether he or she feels it was due to personal characteristics such as sexual orientation/gender identity and/or race) on mental health outcomes also merits further investigation (Mays & Cochran, 2001). These
additional items would assist in development of a more comprehensive scale that could be used in (a) a broader understanding of population health needs; (b) applications at the individual level for better screening in health care settings; and (c) better data at the health systems level to ensure a more comprehensive approach to data collection and treatment referrals.

Limitations

While the high response rate (80%) is a strength of this study, the Honor Project was based on a convenience sample and so the results are not generalizable to American Indian and Alaska Native LGBTT-S individuals or communities in the United States. The current sample did not include those LGBTT-S individuals who did not see or respond to the advertisements or were not actively recruited for the study through the sampling methodology. In addition, the Honor Project focused on seven urban areas, and therefore rural AI/AN LGBTT-S were deliberately omitted from this study’s focus. Stratified analyses based on urban location were not possible, due to the small number of recruits from some locations; thus we were unable to examine differences or associations pertinent to geographical or perhaps cultural variables. This sample is likely to underrepresent AI/AN LGBTT-S people who live in reservation communities, who are not connected to LGBT communities, and perhaps who do not feel comfortable discussing their sexual orientation/gender identity status. Including comparison groups, such as heterosexuals and non-AI/AN individuals, would strengthen the analyses. Finally, a longitudinal study would benefit these communities to confirm the relationships between predictors, such as BRV, and mental health and substance abuse outcomes.

Conclusion

Acknowledging sexual orientation/gender identity in the larger U.S. society continues to create physical and social risks for members of lesbian, gay, bisexual, transgender, and two-spirit communities. The results of this convenience sample analysis demonstrate the need for further research in this area to comprehensively explore the risk factors for American Indian and Alaska Native LGBTT-S individuals. In particular, given the level of victimization experienced by this sample and the association with generalized anxiety disorder, there is a need to confirm this relationship to improve health access for this community and enhance the health care they receive. By analyzing the association between bias-related victimization and mental health outcomes across a national or regional sample, it would be possible to confirm these findings. It would also enable a more comprehensive analysis to include review of a possible dose-response relationship, which would enhance opportunities to develop interventions and improve clinical treatment modalities.

This study demonstrates the need to include questions on violence exposure and racial affiliation for at-risk minority populations to better examine relationships between individual factors and health outcomes at the population level. Health care settings available to AI/AN LGBTT-S people, in particular urban Indian health care clinics, should provide education to
The Relationship Between Bias-Related Victimization and Generalized Anxiety Disorder Among American Indian and Alaska Native Lesbian, Gay, Bisexual, Transgender, Two-Spirit Community Members • Myra Parker, Bonnie Duran, Karina Walters • DOI:10.18357/ijih12201717785

providers and health care staff to institutionalize supports within and across health care settings that promote disclosure on victimization. These types of system-level supports would contribute to a more productive health dialogue not only between individuals and their providers, but across health care settings in general and thus improve identification and assessment of at-risk individuals. In addition, including victimization measures in national surveys would provide data to clarify our understanding of the factors affecting AI/AN LGBTT-S individuals, and other LGBT individuals across racial groups. Our results indicate that there is a potential relationship between BRV and generalized anxiety disorder. There is a need to confirm this finding to lend support for meaningful improvements in how the United States addresses mental health needs related to victimization and how the health care system responds to these critical issues.

Although this study must be considered against the limitations of the study design, the combined experience of being AI/AN and LGBTT-S for this group meant exposure to discrimination and violence. In addition, they experienced important mental health outcomes, in particular, the clinical symptoms of generalized anxiety disorder. The intersectionality of identities presents an important theoretical orientation to improve our understanding of the relationship between BRV and mental health outcomes for marginalized groups. This study provides additional support to the need to include diverse populations in research. It also supports clinical changes that incorporate questions about bias and discrimination to better tailor mental health care for populations that have a higher risk.

References


The Relationship Between Bias-Related Victimization and Generalized Anxiety Disorder Among American Indian and Alaska Native Lesbian, Gay, Bisexual, Transgender, Two-Spirit Community Members • Myra Parker, Bonnie Duran, Karina Walters • DOI:10.18357/ijih122201717785


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Risks and Impacts to First Nation Health and the Mount Polley Mine Tailings Dam Failure

Abstract
In August 2014, the Mount Polley Mine tailings dam was breached, releasing millions of cubic metres of tailings water and tailings into Polley Lake, Quesnel Lake, and Hazeltine Creek in British Columbia (BC), Canada. To date, no assessment has identified the communities impacted by this event, nor how they were impacted, from a social or health perspective. This qualitative study uses a community-based participatory research approach to identify (1) First Nations impacted by this incident and (2) impacts to Aboriginal health experienced by these communities. To address these gaps in knowledge, the First Nations Health Authority funded the project team to complete the first two phases of a health impact assessment. This work draws attention to the strong links between First Nations, the land and resources, culture, and associated health outcomes. In considering the importance of Aboriginal health and culturally appropriate health pathways, the project team identified 4 key impacts: environmental dispossession, emotional stress, altered dietary patterns, and changes in physical activity. The similarity in impacts associated with the Mount Polley tailings dam failure for many First Nations in BC is best understood through an in-depth understanding of the importance of the Fraser River as a source of salmon for their communities. This work documents the unidentified and unfulfilled need to ameliorate the extent of emotional trauma prompted by real or perceived threat to salmon health, a threat exacerbated by a lack of reliable information from trusted sources in the aftermath of the breach. Relevant recommendations are also provided.

Keywords
First Nations, health impact assessment, Mount Polley Mine, Aboriginal health, Fraser River system, salmon

Authors
The authors are health impact assessment/social performance practitioners who work on behalf of First Nations and the First Nations Health Authority in British Columbia, Canada, and for other governments, institutes, and industry internationally. Dr. Shandro, Dr. Winkler, and Ms. Jokinen also hold university research positions focused on identifying, managing, and monitoring health impacts associated with the extractive sector.

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Laura Jokinen, BA, MSc, Arrowsmith Gold Inc., Parksville, BC, and PhD candidate at the University of Victoria.
Acknowledgements

The project team would like to sincerely acknowledge the time, energy, and dedication that First Nation chiefs, health and natural resource leaders, elders, and community members have invested in this work. The team would also like to express gratitude to community members, Band administration staff, and community-based coordinators who assisted the project team and provided logistical arrangements for scoping activities. Finally, the project team would like to acknowledge the First Nations Health Authority for financially supporting this work and filling a critical gap in British Columbia, Canada.

Introduction

British Columbia (BC) is one of Canada’s most culturally diverse provinces. It is home to 198 First Nations speaking 32 First Nation languages (representing 60% of First Nation languages in Canada) with 59 dialects (First Peoples’ Heritage, Language and Culture Council, 2010). For close to 9,000 years, many First Nations in BC have resided along the Fraser River system, the longest river in BC, which stretches 1,375 km across the province before reaching the Strait of Georgia near the city of Vancouver (Nguyen, Young, Hinch, & Cooke, 2016). For many First Nations, the Fraser River is regarded as an important location where they can engage in traditional activities, including salmon fishing, which is distinctively linked to culture, community, and health (First Nations Health Authority [FNHA], 2014; Reading & Wien, 2009). Salmon fishing, as a traditional activity, has been practiced for generations and provides the basis for a series of community gatherings that underpin community cohesion and reaffirm values. Fishing, fish processing, and preserving provide opportunities for shared activity, play an important role in maintaining a sense of identity, represent a physical manifestation of culture, and create opportunities for traditional knowledge to be passed from First Nation elders to youth (Chandler & Lalonde, 1998; Kant, Vertinsky, Zheng, & Smith, 2013). Furthermore, fishing and other traditional and self-sufficient food harvesting and hunting practices are nutritionally critical and economically benefit rural and remote communities by reducing reliance on often expensive and less nutritious, store-bought food (FNHA, 2009).

On August 4, 2014, the first day salmon fisheries opened for First Nations along the Fraser River, the Mount Polley Mine tailings storage facility was breached and released 25 million cubic metres of mine waste into the Fraser River watershed (Petticrew et al., 2015). Following the spill, the BC government and the Mount Polley Mining Corporation released technical, environmental, and assessment reports describing pre-event infrastructure issues, post-event impacts to the receiving environments, and future pathways for re-permitting (BC Ministry...
of Environment, n.d.; Morgenstern, Vick, & Van Zyl, 2015; Swan, Epps, & Miller, 2014). Notably lacking was a systematic, rigorous assessment that identified (a) First Nations who were impacted by this incident, and (b) impacts to Aboriginal health experienced by these communities. To address these gaps in knowledge, the First Nations Health Authority (FNHA) funded the project team to complete the first two phases of a health impact assessment (HIA), namely screening and scoping (World Health Organization [WHO], n.d.).

The International Finance Corporation (IFC) Performance Standards recognize that “project activities, equipment, and infrastructure can increase community exposure to risks and impacts” and requires companies to “avoid or minimize the impacts and risks to community health, safety, and security that may arise from project-related activities, with particular attention to vulnerable groups” (IFC, 2012, p. 1). In addition, “depending on the type of environmental and social impact, clients may be required to assess the potential impacts to the health of a community through a process known as a ‘Health Impact Assessment (HIA).’ This may include reviews of existing health statistics, and evaluation of potential impacts of the project on the health and safety of the affected community” (IFC, n.d., para. 3).

A HIA is a systematic approach that uses mixed-methods research designs to assess health risks and impacts associated with a project, program, or policy. The assessment comprises five distinct phases (i.e., screening, scoping, analysis, reporting, and monitoring) and considers environmental, social, and culturally appropriate determinants of health (BC Ministry of Environment, 2014; WHO, n.d.). First, the screening phase establishes the health relevance of the project, program, or policy of concern. Second, the scoping phase identifies health issues and public concerns and defines the terms of reference of the assessment. Third, the analysis phase involves an in-depth analysis of associated health impacts using evidence from secondary and/or primary sources. Fourth, the reporting phase seeks to mitigate negative and enhance positive health impacts by providing recommendations that are prioritized based on risk assessment. Fifth, the monitoring phase monitors implementation and evaluates impacts (WHO, n.d.). Broad stakeholder involvement throughout the assessment phases is an essential feature of HIAs (Winkler et al., 2013).

This paper describes findings from the Mount Polley Mine HIA screening and scoping phases, with focus on health risks and impacts to First Nations associated with this disaster. Specifically, the screening and scoping phases of the HIA had the following objectives: (1) review available environmental, industry, and community health data; (2) identify potentially impacted communities; (3) identify probable community-level impacts on determinants of health linked to the Mount Polley Mine tailing dam breach; (4) undertake a gap analysis based on existing literature to highlight existing data and identify additional evidence required for the full HIA; and (5) identify interim measures to reduce ongoing health impacts and risks for affected First Nations.
Methods

The research model for this HIA is rooted in community-based participatory research, which aims to equalize power differences within the research process, build trust between researchers and communities, and foster a sense of ownership for participating communities (Hacker, 2013). The project adhered to Canada’s federal Tri-Council Policy Statement for research involving Aboriginal Peoples of Canada (CIHR, NSERC, & SSHRC, 2014) and applied OCAP\(^1\) data principles (Schnarch, 2004). To meet the objectives of the assessment, community-based coordinators worked in collaboration with the project team and provided logistical arrangements for scoping phase activities.

Review and Synthesis of Available Data

The project team reviewed and organized available data on the Mount Polley Mine tailings dam failure prior to the screening and scoping phase. These data included community demographic and health information for First Nations (e.g., Aboriginal Affairs and Northern Development Canada community data), project-related documents for the Mount Polley Mine tailings dam breach (e.g., environmental reports, academic studies, press releases), and water and fish sampling studies. This information underpinned the development of key-informant interviews that were conducted during the screening and scoping phases and contributed to the identification of data gaps.

Screening Phase

Between September and November 2015, the project team contacted First Nations to participate in the screening phase of the Mount Polley Mine HIA. The purpose of the screening phase was to identify potentially impacted First Nations in the region and identify community-level impacts related to the tailings dam breach. The following criteria were used to purposefully select communities to participate in the project:

1. The First Nation is located in close proximity to the Mount Polley Mine site and/or is situated along the Quesnel or Fraser River;
2. The First Nation’s traditional land was directly impacted by the tailings breach;
3. The First Nation was recommended to participate by the FNHA and FNHA community engagement coordinators; and
4. The First Nation was recommended by another Nation. First Nation leaders recommended other Nations, resulting in a snowball effect which involved “identifying respondents who are then used to refer researchers on to other respondents” (Atkinson & Flint, 2001). For example, during interviews, participants recommended the project team contact a specific First Nation for additional information.

\(^1\) Standing for ownership, control, access, and possession, OCAP\(^{®}\) is a registered trademark of the First Nations Information Governance Centre (FNIGC; www.fnigc.ca).
By accessing publicly available online sources (e.g., community websites, documents, and registries) and information provided by FNHA, the project team contacted First Nation chiefs, health directors, band council members, and health representatives via telephone to request their participation in the project.

A screening instrument was developed to identify communities potentially impacted by the Mount Polley Mine tailings breach. This instrument involved a short set of closed-ended questions related to potential impacts of the event (e.g., impacts to personal fishing practices, commercial fisheries, traditional land use). The research team administered the screening instrument via telephone with a designated First Nation representative.

In total, 47 communities were contacted by the project (46 First Nations; one non-First Nation community) and 24 responded (23 First Nations; one non-First Nation community). After receiving project-related information, only one First Nation did not self-identify as experiencing impacts following the tailings dam failure.

Scoping Phase

The aim of the scoping phase was to organize diverse, often fragmentary, evidence into a coherent framework to enable the research team to identify potential health risks and impacts related to the tailings dam breach. Risks and impacts specific to each community are reported. The scoping phase involved a gap analysis of available data and a site visit, which included key-informant interviews, focus groups, observation, and situational analyses. A subsequent gap analysis determined the needs for further baseline data collection.

The Mount Polley Mine HIA scoping phase focused on the communities that were directly impacted by the Mount Polley Mine breach (i.e., as identified during the screening phase or through direct knowledge of impacts).

Site Visit

The fieldwork consisted of interviews with key informants focusing on the health impacts/risks associated with the Mount Polley Mine tailings dam failure and their effects on individuals and on the community. To provide additional insight into sociocultural aspects and to support local capacity development, community-based coordinators assisted with the research, facilitating site visits (i.e., organizing and facilitating key-informant interviews and group discussions), gathering locally available data, and reviewing project findings.

During the site visit, the team held semi-structured interviews using a grounded theory approach (Corbin & Strauss, 2008) with purposefully selected key informants from the health and natural resource sectors. Informants selected were directly involved in health service provision or natural resource monitoring for their communities. Interviews were approximately one hour in length, and detailed field and observation notes were taken. Participants were asked to provide their perspective on community- and individual-level health impacts linked to the Mount Polley Mine tailings dam failure.
The team also participated in Nation assembly meetings, chiefs’ meetings, chief and band council meetings, and lunches with elders, and it facilitated a community forum.

The following 16 First Nations participated in the Mount Polley Mine HIA scoping phase:

- Lhtako Dené Nation
- Lilooet Tribal Council: N’Quatqua First Nation, Sekw’el’wás, T’íí’t’qé First Nation, Tsalálh, Xaxli’p, Xwíst’en
- Stswecem’c Xgat’tem First Nation
- T’exelc (Williams Lake Indian Band)
- Xatsúll First Nation (Soda Creek Indian Band)

Validation of Research Findings

In line with Knowledge Translation approaches, an iterative process supported the confirmation of research findings. Knowledge Translation is defined as a “dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system” (Canadian Institutes of Health Research, 2016, Introduction). First, as per Knowledge Translation and grounded theory approaches, member checks occurred in real time (during interviews). Once the findings had been synthesized and reported on, each First Nation received a draft version of the report and a short summary, and had an in-person presentation of findings by the research lead. The presentations varied and were developed to meet the needs of each specific First Nation (e.g., they included bidirectional sharing of research findings at elders’ luncheons, formal community meetings, chief and council meetings, one-on-one meetings with key informants, and presentations at large community events). A similar approach was used to share findings with FNHA. In addition, a highly qualified professor and Canada Research Chair in rural health at the University of Victoria completed peer review, along with a senior social performance international expert (holding 15+ years’ experience on extractive sector and community issues). The work was finalized after reviewing findings and recommendations with participant communities and peer reviewers.

Results

Screening Phase Findings

Community-specific findings identified as part of the screening phase fieldwork are presented in Table 1. Results from the screening phase highlight the geographical extent of impacts experienced by First Nations as a result of the Mount Polley Mine tailings dam failure (Figure 1). For example, Spuzzum First Nation, located 425 km South from the mine site, and
Tl’azt’en Nation located 426 km Northwest from the mine site, reported community-level impacts from the Mount Polley Mine tailings dam breach. The majority of communities reported impacts to personal fishing practices, increases in emotional stress, and increased administration burden.

Table 1

*Reported Impacts/Key Issues Related to the Mount Polley Mine Tailings Dam Failure Experienced by Communities Who Participated in the Screening Phase of the Project*

<table>
<thead>
<tr>
<th>Community</th>
<th>Traditional territory directly impacted</th>
<th>Decrease in individual fishing practices</th>
<th>Impacts on commercial fisheries</th>
<th>Emotional stress</th>
<th>Increased administration burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston Bar First Nation</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ḍesdilagh First Nation</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lhtako Dené Nation</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Nak’ażdli Whut’en</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>N’Quatqua First Nation</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sekw’el’wás</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Simpcw First Nation</td>
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<td>Skatín</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Spuzzum First Nation</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Stswecem’c Xgat’tem First Nation</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>T’eqt’aqtn’mux (Kanaka Bar Indian Band)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>T’exece (Williams Lake Indian Band)</td>
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<td>X</td>
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<tr>
<td>T’it’q’et First Nation</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tl’ażt’en Nation</td>
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<td>Tšideleld</td>
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<td>Xeni Gwet’in First Nation</td>
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<tr>
<td>Yunesit’in Government</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Risks and Impacts to First Nation Health and the Mount Polley Mine Tailings Dam Failure • Janis Shandro, Laura Jokinen, Alison Stockwell, Francesco Mazzei, Mirko S. Winkler • DOI:10.18357/ijih122201717786

Figure 1. A map of participating First Nations and the Mount Polley Mine. All First Nations were identified as impacted with the exception of 22. Communities 1–23 are those that participated in the screening process. Communities 1–16 are those that were involved in scoping phase activities. The Mount Polley Mine site is identified as the pickaxe symbol, and the community of Likely is identified by the yellow dot. This map demonstrates the geographical extent of impacts experienced by First Nations.

Traditional fishing areas were avoided by some communities, due to their concern about contamination of the Fraser River system. It was reported that members of these communities travelled greater distances to catch fish for the season. In other communities, such as T’eqt’aqtn’mux, leadership proactively encouraged members to fish following the Mount Polley Mine tailings breach. Despite the concerns regarding the safety of consuming fish from the Fraser River, the impacts to community health would be too great if members were unable to catch and consume fish.

Results from the screening phase also highlighted the extent of post-breach emotional stress at the community level. For instance, the Nak’ażdli Whut’en (near Fort St. James) described an intense emotional response following the tailings dam failure. Health service providers noticed increases in anger, sadness, fear, and confusion among band members. The uncertainty surrounding the event and the potential irreversible impacts to the environment were described as deeply concerning.
Another impact reported was increased inter-community tension, in particular the actions, motivations, decisions, and/or mitigation measures of one First Nation being questioned and critiqued by another.

The screening instrument provided preliminary data indicating potential community-level impacts related to the Mount Polley tailings dam breach, and it highlighted that the geographical extent of impacts experienced by First Nations throughout BC was much larger than what was being addressed by the mining company and provincial government. The only Nation that did not report impacts was Boston Bar. This phase helped establish more detailed scoping phase interview questions.

Table 2

**Reported Scoping Phase Impacts/Key Issues Related to the Mount Polley Mine Tailings Dam Failure Experienced**

<table>
<thead>
<tr>
<th>Key issue or impact</th>
<th>Lillooet Tribal Council Nations</th>
<th>Lhtako Dené Nation</th>
<th>Stswecem’c Xgat’tem First Nation</th>
<th>T’exelc Xatśūl First Nation</th>
<th>Xatśūll First Nation</th>
<th>T’silhqot’in National Government Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to receive information in timely manner about the Mount Polley tailings dam breach from the responsible parties or from government representatives</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Distrust in received information on Mount Polley Mine breach</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Increased administrative burden experienced by leadership and staff in attempts to understand the situation around Mount Polley</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Decreased/discontinued traditional land use activities</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Decreased/discontinued personal fishing practices</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Decreased/discontinued commercial fishing resulting in loss of revenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Emotional stress</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Increased intra-community tension</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Increased inter-community tension</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>
Three First Nations—Xat'sūll, T’xelc (Williams Lake Band), and Lhtako Dené First Nation—suffered direct impacts that were immediate and are ongoing. Through the process of environmental dispossession, access to sacred land and territory, traditional food sources, and medicine has been lost. These three First Nations are experiencing impacts involving a wider range of potential pathways that can influence community health. In addition to environmental dispossession, the following impacts were also reported by all participating First Nations (except Boston Bar):

- **Continued emotional stress in relation to the Mount Polley incident.** The level of emotional stress is linked to the severity of potential impacts and risks perceived by the community and the level of uncertainty and lack of trust in the information provided. Emotional stress was also felt by community leadership in relation to the increased administrative burden resulting from the tailings dam failure. This increased burden was placed on community leadership who reported substantial workloads in attempts to garner credible, trustworthy information related to the event, environmental assessment results, efforts for remediation, and the safety of salmon and the Fraser River system.

- **Altered dietary patterns and reduced physical activity as a result of a Decrease in fishing practice and cultural practices.** Commercial fishing activities were also affected, resulting in reduced community income and employment opportunity. Decreased fishing activities, as well as practice of fish-related cultural traditions, has had a negative impact on the physical activity of affected communities, which is directly associated with their health status.

This project highlights the extent of emotional trauma prompted by real or perceived threat to salmon health that has been exacerbated by a lack of reliable information from trusted sources in the aftermath of the breach. These factors led affected First Nations to cease or significantly reduce salmon fishing during 2014, and for some, this issue remains. This repression of culture holds significant implications for health and well-being. In Canada, it is well recognized that cultural/emotional trauma has contributed to physical, psychological, economic, and political disadvantage for Aboriginal people.

**Limitations**

Limitations of this project include the time between the event and screening/scoping phase activities in addition to the commitment (financial) to next phases. The work was commissioned by FNHA as both industry and the provincial government failed to implement a social or health impact assessment as part of the response to the tailings dam failure. Unfortunately, by the time the HIA was initiated, one year had passed. Therefore, the impacts captured by this project may not be comprehensive and only represent a snapshot in time. Resources to complete this work remain uncommitted at the time of writing. Recommended required next steps for this HIA are under recommendations, below.
Discussion

Environmental Dispossession and Health Risks

Richmond & Ross (2009) describe environmental dispossession as a critical pathway for negative health outcomes experienced by Aboriginal people. They define environmental dispossession as the “processes by which aboriginal people’s access to the resources in their traditional environments are reduced” (p. 403). According to Cunsolo Willox et al. (2013), First Nation people’s “identity, conceptions of the self, and mental wellness are directly and intimately linked to the environment, and to the ability to hunt, trap, fish, forage, and travel on the land and continue to practice cultural traditions related to being ‘on the land’” (p. 260). On one hand, positive health outcomes (e.g., improved diet, exercise, increased self-esteem, improved mental health) have been reported when individuals engaged in land-based activities (Jokinen et al., 2015; Shandro et al., 2014). On the other hand, a wide range of negative health outcomes have been found to be associated with changes in the environment. When Aboriginal access to land is restricted, studies report increases in mental-health stressors, family stress, substance use, suicidal ideation, and prevalence of cardiovascular disease (Cunsolo Willox et al., 2013; Dillard, Smith, Ferucci, & Lanier, 2012; Gibson & Klinck, 2005).

Through an iterative process, the foundational finding from this work draws attention to the strong links between First Nations, the land and resources, culture, and associated health outcomes. For the most directly impacted communities, the Mount Polley tailings dam failure has physically restricted First Nations from accessing their traditional territory. All of the affected First Nations lost or experienced (and in some cases, continue to experience) restricted access to traditional resources that are central to their conceptions of self and their ability to travel on the land and continue to practice cultural traditions.

The environmental dispossession model suggests that the overall sum of the individual clusters of impacts described in the preceding sections—psychological stress, changes in diet, and reduced physical activity—is likely to underestimate the overall impacts on health. For First Nations, especially those living in rural and remote areas, the consumption of traditional food is directly linked to positive health outcomes. Not only is traditional food a fundamental source of nutrients, the collection of traditional food also provides social and cultural benefits for individuals, families, and communities (Kishigami, 2010). In contrast, limited access to the physical environment such as that resulting from the Mount Polley Mine tailings spill leads to decreased personal knowledge/skills related to food harvesting, reduces consumption of traditional food, leads to more individuals relying on store-bought food or government-sponsored food programs, and reduces social cohesion and cultural benefits for communities. In addition, when accessing food through non-traditional sources, the risk of cardiovascular disease increases due to unhealthy food being incorporated into diets more often (Richmond & Ross, 2009). Consideration of the environmental dispossession pathway as a potential source of health impacts and risks may suggest additional holistic issues to address.
Salmon and the Health of the Fraser River: Critical Determinants of Health for Many BC First Nations

First Nations who participated in this research reported overwhelmingly negative impacts on fishing practices and access to traditional food sources (i.e., salmon) following the Mount Polley Mine tailings dam breach. Researchers had posited that this would influence community health primarily through changes to dietary patterns; however, in the course of the research it became clear that there are broader consequences that require consideration. Project findings indicate the central role that salmon fishing plays in a wide variety of determinants of health ranging from physical activity to social cohesion, learning and sharing cultural identity, and a wide range of factors affecting emotional health. Inclusion of the environmental dispossession pathway as one that is critical to preventing health impacts points to the particular importance of this array of drivers to the overall health of First Nations.

The environmental dispossession pathway also highlights the importance of a holistic understanding of the environment, including regional water systems, for First Nations if they are to improve their health status to one that is more aligned with the broader Canadian status. International standards recognize the importance of ecosystem health and ecosystem services (e.g., the production of food and water) as key factors to consider in relation to projects and their potential impacts on and risks to community health and safety. According to the IFC (2012), the “project’s direct impacts on priority ecosystem services may result in adverse health and safety risks and impacts to Affected Communities” (p. 2). Project proponents must identify and avoid potential risks/impacts. When unavoidable, mitigation measures based on best practice are to be implemented (IFC, 2012).

Over the course of the research, First Nations repeatedly expressed concerns over the health of the Fraser River system in general and its salmon in particular, in the context of cumulative impacts from multiple sources (e.g., tailings dam breaches and the direct discharge of tailings waste through permit approval, point source discharges, organic pollutants, fish farming impacts, etc.). Based on the principle of intuitive toxicology (the process by which lay people rely on their senses to detect unsafe water, food, or air, and distrust information from experts that contradicts their experience), First Nations observe negative changes in salmon populations and salmon health and distrust information provided by experts claiming that all is well (Neil, Malmfors, & Slovic, 1994). These concerns lead to a sense of environmental dispossession, an important determinant of Aboriginal health (Cunsolo Willox et al., 2013).

Communities are losing not only access to the environment, but also the traditional practices associated with catching, preserving, and consuming salmon that the environment hosts. Given the complexity of the relationship between First Nations in BC and salmon, the project team concludes that the loss of salmon, or the continued distrust in the health of salmon in the Fraser River system, will result in devastating cultural impacts to First Nations across BC. Therefore, we recommend that FNHA consider promoting an understanding of salmon health as a key determinant of First Nation health for BC communities and find ways to advocate for studies and mitigation actions that will protect the river ecosystem and identify the causes of the
observed impacts on salmon populations and health. While studies to date have focused on the immediate safety of salmon for eating and often focus on whether contaminant levels exceed legally recognized threshold levels, the First Nations have a more nuanced understanding of their environment and ask questions about the impacts on spawn and juvenile fish of hatching and growing in lakes lined by tailings sediment, and the potential impacts of this on the return rate after three years at sea. They also recognize that levels of toxins that have no significant immediate impact on human health may make fish more susceptible to illness, or simply make them less resilient to surviving through their life cycle. Together these factors point to an urgent need to protect the health of the Fraser River system in an integrated manner, as the health of the river, of its salmon, and of BC First Nations are intrinsically linked, and are perceived by many First Nation people interviewed to be at risk.

**Recommendations**

The next step in completing the HIA process is the collection and participatory analysis of data specific to the impacted First Nations that are identified in Table 1 above. In view of the data gaps identified, this will require primary data collection in the affected First Nations, as well as an assessment and analysis of the data that are available through the routine health information system.

Additional data collection will aim to:

- add to and amend information at a local level to fully describe the current status of health determinants and outcomes in affected communities. Researchers will also include analysis of retrospective components in the data collection, to support the modelling of health impacts and associated management/mitigation measures; and
- establish a solid health, environmental, and sociocultural baseline as part of an overarching surveillance and response mechanism to identify potential long-term impacts and monitor change over time. First Nations participating in the study viewed this as particularly important in light of the fact that the Mount Polley Mine is currently operating again and has recently received approval for tailings water discharge into Quesnel Lake.

In addition to contributing to the design of the full HIA, the screening and scoping phase work identified ongoing health impacts and risks for First Nations that could be significantly reduced through targeted interventions. Chronic emotional stress is known to be detrimental to health, and strategies could be implemented in the short term to reduce the drivers of stress and to mitigate its symptoms and physiological impacts. These include the following:

- **Improve access to counselling and cultural healing processes.** One approach to reducing stress would be to ensure access to counselling for affected community members and to develop and implement a culturally appropriate healing process.
• **Improve access to trusted information on a range of issues.** Finding appropriate channels for providing information that can be trusted by impacted First Nations and working with them to develop data to address their concerns could alleviate the uncertainty and distrust. Community-based participatory processes could be considered. The FNHA appears to be in a strong position to facilitate the identification and delivery of trusted information.

• **Address ongoing constraints to accessing traditional diets and medicine.** It will take time to restore trust in the safety of consuming traditional food or to identify prudent alternatives that take into consideration the unique concerns of First Nations. In the interim, maintaining health levels depends on replacing the losses in salmon and other foods/medicines with equivalent sources that communities trust to be safe.

• **Initiate a grievance and compensation process for use by affected individuals and communities.** Developing a grievance process acceptable to the affected First Nations would provide a channel to seek redress from the Mount Polley Mining Corporation. In the interest of limiting ongoing and further damage, an interim compensation fund could be established by the company to address the priorities identified in this report.

Another recommendation is to provide advocacy support to Lhtako Dené, as evidence contained in this report places their traditional territory within the Mount Polley Mine tailings breach area. It is recommended that they have access to meetings in Likely (or elsewhere) at no cost to determine appropriate actions for the BC Ministry of Environment and Mount Polley Mining Corporation.

Finally, we have identified a series of policy recommendations (Shandro, Winkler, Jokinen, & Stockwell, 2016) based on the research and on experiences working with Indigenous communities and with international mining companies worldwide. The most important of these recommendations is for the FNHA to play an advocacy role in explaining the critical importance of salmon fishing in a wide variety of determinants of First Nation health, ranging from physical exercise to social cohesion, building and sharing cultural identity, and a wide range of factors affecting emotional health. More holistically these could be seen as a range of factors leading to a sense of environmental and cultural belonging (the opposite of environmental dispossession).

The project team recommends that FNHA advocate for studies and mitigation actions that will protect the river ecosystem and identify the causes of the observed impacts on salmon populations and health. First Nation health appears to be intrinsically linked to an urgent need to protect the health of the Fraser River system in an integrated manner. This study calls for attention to the health of the Fraser River and to the importance of salmon for First Nations. A more detailed review of the above recommendations can be found in the full HIA scoping phase report (Shandro et al., 2016).
Risks and Impacts to First Nation Health and the Mount Polley Mine Tailings Dam Failure • Janis Shandro, Laura Jokinen, Alison Stockwell, Francesco Mazzei, Mirko S. Winkler • DOI:10.18357/ijih122201717786

Conclusion

The key objectives of the screening and scoping phases of the health impact assessment were to review existing health and environmental data; identify communities potentially impacted by the Mount Polley disaster; identify community-level health and social impacts; complete a gap analysis of the information needed to support a full health impact assessment; and identify interim measures to decrease on-going health impacts and risks for affected First Nations. The research team contacted 46 First Nations based on geographical location, recommendations of the First Nations Health Authority, and recommendations made by screening and scoping phase participants. The principal findings of this work, based on 22 First Nations that reported impacts, are as follows:

- Past and continued experiences with emotional stress are the key impacts shared among all communities in relation to the incident. The level of emotional stress is linked to the severity of potential impacts and risks perceived by the community and the level of uncertainty and lack of trust in the information provided.
- In general, First Nations experienced a decrease in subsistence (and at times, also commercial) fishing practices that resulted in shifts in dietary, physical activity, and cultural practices; lost income from commercial fisheries; and increased stress on administrators.
- Communities of Xat’sull, T’exelc, and Lhtako Dené reported more direct impacts to their traditional territories, located close to the Mount Polley Mine.
- Similar impacts were observed between Nations located closest to and furthest from the spill. The project team speculates that this is explained by salmon health as an important determinant of health among Fraser River First Nations.

Based on these results, the project team identified interrelated pathways of existing and potential health impacts. These themes provide a coherent framework for further analysis:

1. Environmental dispossession
2. Emotional stress
3. Altered dietary patterns with associated health impacts and risks
4. Changes to physical activity with associated impacts and risks

This work also creates a path forward for further investigation. The screening and scoping phases identified information requirements for a full health impact assessment on the impacts of the Mount Polley spill on First Nations. In addition, it also identified ongoing health impacts and risks for communities, and it recommends interventions that could significantly reduce them. These urgent recommendations include:

- Improve access to emotional counselling and cultural healing processes.
- Improve access to trusted information on an appropriate range of issues.
• Address ongoing constraints on access to traditional diets and medicine.
• Institute a grievance process for use by affected individuals and communities.

Finally, the project team recommends that the First Nations Health Authority play an advocacy role in explaining the critical importance of salmon fishing in the wide variety of determinants of First Nation health. In addition, we recommend that the First Nations Health Authority advocate for studies and mitigation actions that protect the river ecosystem and investigate the causes of observed impacts on salmon populations and health. As the health of First Nations involved in this study is intrinsically linked to the health of the Fraser River, it is essential to take action on reducing these environmental health risks.

References


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