



Trauma and suicide behaviour histories among a Canadian indigenous population: An empirical exploration of the potential role of Canada's residential school system

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ARTICLE INFO

Article history:

Available online 6 March 2012

Keywords:

Canada
Indigenous people
Suicide
Residential school
Multigenerational trauma
Abuse
Ethnicity
Mental health

ABSTRACT

It has been theorized that suicide behaviours amongst indigenous peoples may be an outcome of mass trauma experienced as a result of colonization. In Canada, qualitative evidence has suggested that the Indian Residential School System set in motion a cycle of trauma, with some survivors reporting subsequent abuse, suicide, and other related behaviours. It has been further postulated that the effects of trauma can also be passed inter-generationally. Today, there are four generations of Canadian First Nations residential school survivors who may have transmitted the trauma they experienced to their own children and grandchildren. No empirical study has ever been undertaken to demonstrate this dynamic. This study is therefore the first to investigate whether a direct or indirect exposure to Canada's residential school system is associated with trauma and suicide behaviour histories. Data were collected in 2002/2003 from a representative sample of Manitoba, Canada, First Nations adults ($N = 2953$), including residential ($N = 611$) and non-residential school attendees ($N = 2342$). Regression analyses showed that for residential school attendees negative experiences in residential school were associated with a history of abuse, and that this history and being of younger age was associated with a history of suicide thoughts, whereas abuse history only was associated with a history of suicide attempts. For First Nations adults who did not attend a residential school, we found that age 28–44, female sex, not having a partner, and having a parent or grandparent who attended a residential school was associated with a history of abuse. This history, along with age and having had a parent or grandparent who attended residential school was associated with a history of suicide thoughts and attempts. In conclusion, this is the first study to empirically demonstrate, at the population level, the mental health impact of the residential school system on survivors and their children.

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Introduction

It has been theorized that suicide behaviour amongst indigenous peoples, worldwide, is a major outcome of the mass trauma experienced as a result of colonization (Beautrais & Fergusson, 2006; Bryant-Davis, 2007; Duran, 2006; Durie, 2001; Gagné, 1998; Hunter & Harvey, 2002; Hunter & Milroy, 2006; Kirmayer, Brass, & Tait, 2000; Koolmartie & Williams, 2000; Lawson-Te Aho, 1998; Lawson-Te Aho & Liu, 2010; Willmon-Hague & Bigfoot,

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2008). Post-colonial theory situates such experience and cycle of trauma as one of persistent ethnic cleansing and psychic wounding (Duran & Duran, 1995). Historical trauma theories liken the impact of indigenous genocide, ethnic cleansing, and forced government acculturation policies to that of the intergenerational trauma experienced by holocaust survivors and their families (Braveheart, 1998, 1999a, b; Braveheart & DeBruyn, 1998). What differentiates the experience of indigenous peoples from that of holocaust survivors and families is that the trauma experienced by indigenous peoples was not confined to a single distinct, large-scale event limited in time. The experiences of indigenous peoples has been ongoing, and always present, making historical trauma a part of a common experience, subtly shaping the lives and futures of individuals, families and communities (Evans-Campbell, 2008; Fast

& Collin-Vézina, 2010; Menzies, 2006; Wesley-Esquimaux & Smolewski, 2004). According to Braveheart (1998), manifestations of such cumulative emotional and psychological wounding over generations have included high rates of suicide and the major correlates of suicide – abuse, poor social support and difficulty forming and maintaining relationships.

Mass trauma and the Indian residential school experience

In Canada, compelling qualitative evidence suggests that the federal colonial Indian Residential School System set into motion this cycle of trauma (Fournier & Crey, 1997; Furniss, 1992; Gagné, 1998; Haig-Brown, 1988; Kirmayer, Simpson, & Cargo, 2003; Milloy, 1999). As early as 1892, indigenous children were removed from their families and communities and sent to schools operated by the Roman Catholic Church, Church of England, United Church, or Presbyterian Church, and later by the Government of Canada. The removal of children from families and communities was a lawful government practice, intended to delimit the social and cultural identity of indigenous children. By christianizing, civilizing, and then re-socializing these children, the Federal government hoped that these children, and subsequent generations, would contribute economically to a modernizing Canada. This vision was not realized (Milloy, 1999; Royal Commission of Aboriginal Peoples, 1996).

While the failure of the system was evident early on, the residential school policy remained in effect until 1996 when the last government – run residential school closed. In one century, the Government of Canada exposed tens of thousands of indigenous children to a system fraught with structural and systemic problems, impacting their wellbeing and that of their families, communities and future generations. The legal, archival and narrative record suggests that the removal of children from families and communities and their placement in residential schools had altered family and community bonds (RCAP, 1996). Many residential school children experienced a loss of culture, language, traditional values, family bonding, life and parenting skills, self-respect, and the respect for others. Their parents, in turn, lost their roles as caregivers, nurturers, teachers, and family decision-makers. Overtime, the residential school system had loosened the emotional bond between parent and child, which Morrisette (1994) has likened to a residual holocaust effect. The loss of language and ties to Elders and traditional and spiritual teachings further isolated children from their cultural and spiritual roots. This loss disrupted the transmission of indigenous knowledge to subsequent generations. Upon release from the schools, survivors reported a legacy of alcohol and drug abuse problems, feelings of hopelessness, dependency, isolation, low self-esteem, suicide behaviours, prostitution, gambling, homelessness, sexual abuse, and violence. For women survivors, this exposure coupled with other forms of systemic and structural discrimination had placed them at even greater risk for such negative outcomes (Evans-Campbell, Lindhorst, Huang, & Walters, 2006; Réaume & Macklem, 1994; Stout & Peters, 2011). Today, there are four generations of First Nations residential school survivors in Canada who may have transmitted the trauma they experienced to their own children and the children of their children, and to non-descendants by way of indirect trauma effects at the level of the community (Evans-Campbell, 2008).

Linking mass trauma research to indigenous peoples

Life trajectories of survivors of mass trauma have been well documented amongst holocaust survivors, including second-generation impacts and more recently intergenerational

processes of trauma in third and succeeding generations of survivors (Danieli, 1998; Felsen, 1998). The evidence suggests that survivor and victimization-related pathology does occur but that some survivors and children of mass trauma survivors are free of this pathology (Kellerman, 2001; Levav, Levinson, Radomislensky, Shemesh, & Kohn, 2007). Concerning indigenous populations generally, there is an emerging theoretical literature on how best to distinguish between historical trauma, secondary traumatization, intergenerational grief, lifetime trauma, and the impact such histories have on mental health generally and suicidal behaviours specifically (Dion Stout & Kipling, 2003; Evans-Campbell, 2008; Kirmayer et al., 2007; Leven, 2009; Sotero, 2006). While research shows that trauma and traumatic experiences are just as highly prevalent in both indigenous and non-indigenous populations (Manson, Beals, Klein, Croy, & AI-SUPERPPF Team, 2005), the multigenerational implications of trauma are thought to be greater within indigenous populations since a higher proportion of the population was affected by a large-scale and sustained traumatic exposure (Braveheart, 1998; Duran & Duran, 1995; Gagné, 1998). Very limited empirical research has looked into this trajectory among indigenous people (Sotero, 2006), particularly in relation to suicide behaviour, and no published work is apparent in Canada.

In the U.S., studies conducted among American Indian boarding school students had found that the poor quality of boarding schools, isolation from families and negation of American Indian identity might have contributed to high suicide rates among students (Dinges & Duong-Tran, 1994; Klienfield & Bloom, 1977; Manson, Beals, Dick, & Duclos, 1989). In Canada, a series of reports produced through the Aboriginal Healing Foundation suggested that suicidal behaviours had originated from the mass trauma experienced by residential boarding school survivors, who in turn transmitted these experiences and histories, directly or indirectly, to their offspring (Castellano, 2006). Nonetheless, the link between residential school exposure (direct or indirect), abuse, and suicide, has not been easy to establish empirically suggesting the need for more studies to understand these pathways of risk (Sotero, 2006).

The objective of this study was to investigate whether a direct or indirect exposure to Canada's residential school system was associated with trauma and suicide behaviour histories in a Canadian indigenous adult population, comprised of residential school survivors, their offspring, and individuals potentially exposed to effects of this mass trauma. Since direct residential school exposure was not randomized to all community members in the First Nation population, a level approach represented by cohorts would better disentangle the various effects of historical trauma (Evans-Campbell, 2008). In Canada, for instance, the last residential school closed in 1996 and in some provinces in 1974–1975, which means that in some regions individuals 18–27 years of age in 2002/2003 could not have attended a residential school. As noted from our review of the literature, a cohort approach would best reveal trauma effects from attending a residential school, having a family member who attended, or an exposure to historical trauma (second order).

Given these levels and cohorts, this study was designed to investigate impacts between two distinct groups – community members who were residential school survivors (attendees) and community members who did not attend a residential school (non-attendees). In First Nation communities, the first cohort was comprised of community members who had a direct exposure to a residential school (or schools). In this cohort, some survivors may be resilient whereas others may have felt that their wellbeing was negatively impacted because of a range of abuses they experienced in a residential school.

The other distinct cohort in First Nations communities were members who did not attend a residential school themselves, but

may have been a descendent of a parent or grandparent who was a residential school survivor. First Nation community members who did not attend a residential school, but were descendants of residential school survivors, may therefore have associated psychological problems somewhat mirroring that of their parents (but less so) or may have experienced abuse or neglect due to poor parenting styles (Stout & Peters, 2011). First Nation community members who did not attend a residential school and did not have any parents or grandparents who attended may have also experienced abuse, neglect or poor mental health outcomes as a result of the historical trauma operating at the community level (Evans-Campbell, 2008).

In a Canadian First Nations On-Reserve population, we hypothesized that after adjusting for age, sex, and relationship status (H1) the odds of having an abuse history were more likely for those who (a) attended a residential school and (b) who had a parent or grandparent who attended a residential school (here in referred to as multigenerational residential school exposure); that (H2) the odds of having a history of suicide thoughts were more likely for those who reported (a) attending a residential school, and (b) had a multigenerational residential school exposure; and that (H3) a suicide attempt history were more likely for those who reported (a) attending a residential school, and had a (b) multigenerational residential school exposure.

Among a cohort of First Nation residential school attendees, we hypothesized that after adjusting for age, sex and relationship status (H4) the odds of having an abuse history were more likely for those who reported (a) negative experiences of residential school and who experienced (b) multigenerational residential school exposure; that (H5) a history of suicide thoughts were more likely for those who reported (a) negative experience of residential school, (b) multigenerational residential school exposure, and (c) an abuse history; and that (H6) a history of suicide attempts were more likely for those who reported (a) negative experiences of residential school, (b) multigenerational residential school exposure, and (c) an abuse history.

Among a cohort of First Nations adults who did not attend a residential school (*non-attendees*), we hypothesized that after adjusting for age, sex and relationship status (H7) the odds of having an abuse history were more likely for those who reported (a) multigenerational residential school exposure; that (H8) the odds of having a history of suicide thoughts were more likely for those who reported (a) multigenerational residential school exposure, and (b) for those with an abuse history; and (H9) a history of suicide attempts were more likely for those who reported (a) multigenerational residential school exposure, and (b) an abuse history.

Methods

Design and sample

In-person interview data from the Manitoba First Nation Regional Longitudinal Adult Health Survey conducted 2002/2003 were used to explore the potential predictors of a lifetime history of abuse, suicide thoughts and suicide attempts among residential and non-residential school attendees. Ethical approval for the survey study was obtained from the Health Research Ethics Board, Faculty of Medicine, at the University of Manitoba.

The survey used a multi-stage stratified random sampling approach (tribal community affiliation and community size), with random selection of small (population <500), medium (population 500–999) and large (population >1000) reserve communities within seven tribal areas in the province of Manitoba (Canada). All sixty-three communities in 2002 were clustered into tribal areas,

and from those areas, randomly selected communities (based on size) were invited to participate, with community level consent provided by the local band Chief and Council. In each community for the adult survey, trained interviewers randomly selected households and, where possible, two adults living in the household (1 male and 1 female) and all adults aged 55 years and older were surveyed. The sample was stratified by sex and age (18–54 years and 55 years and over), with a target sample of 4330 adults. Each participant provided signed individual-level consent.

The survey reached 77% of the target rate from twenty-seven communities, with 60% of the communities achieving a response rate of over 80%. After data cleaning, the dataset contained records for 3109 individuals with slightly more females than males (55% versus 45%). The final dataset included weights to adjust for sampling differences in order to produce estimates representative of the covered population.

Based on 2953 valid responses to the survey question regarding residential school attendance, 2342 had *not attended* a residential school themselves, and 1100 of these individuals (47% of the total sub-sample) were also offspring of residential school attendees in that they had parents and/or grandparents who had attended. All were 18 years of age or older at the time of interview. The remaining 611 individuals were residential school attendees, and 303 (50% of the total sub-sample) were also offspring. Because attendees would have been at least five years old in the year of the last residential school closure in Manitoba in 1974–1975, this sub-sample was therefore 28 years of age or older at the time of interview in 2002/2003.

Independent and outcome measures

For each cohort, three separate binary outcomes were explored: a lifetime history of abuse (No/Yes, “Have you ever experienced any form of physical, mental, emotional or sexual abuse or violence, either as a child, in an adult relationship, or at any other time?”), a lifetime history of having had suicide thoughts (No/Yes, “Have you ever thought about committing suicide?”... either as a child or as an adult), and a lifetime history of suicide attempts (No/Yes, “Have you ever attempted suicide?”... either as a child or as an adult). The social demographic factors we modelled against each outcome included age (age groups 18–27, 28–44, 45+ for the non-attendees and 28–44 and 45+ for the attendees, with older age groups in each sub-sample collapsed due to insufficient numbers), sex (male/female), and relationship status (no partner/partner). These factors are known as the strongest and most consistently reported factors associated with a history of abuse and suicide thoughts and attempts (Nock et al., 2008). Multigenerational residential school exposure (No/Yes, “Did either of your parents attend residential school?” and/or “Did any of your grandparents attend residential school?”) was modelled against the three outcome measures. A lifetime history of abuse (No/Yes, “Have you ever experienced any form of physical, mental, emotional or sexual abuse or violence, either as a child, in an adult relationship, or at any other time”) was also included as a potential explanatory factor for the outcomes of lifetime suicide thoughts and attempts to illustrate a pathway of risk. For the residential school attendees, we also investigated whether a self-reported belief “Do you believe that your overall health and wellbeing has been negatively affected by your attendance at residential school?” (yes/no) predicted a lifetime of abuse, suicide thoughts or suicide attempts.

Statistical analysis

Bivariate testing of all covariate explanatory variables with each of the three outcome measures ensured cell sizes were sufficient for

logistic regression modelling. As cells were sufficiently large, all covariates were then entered into a logistic regression model for each outcome. The final models, adjusting for all predictors and interactions, identified significant independent predictors at $P < 0.05$. SUDAAN (Research Triangle Institute, Version 10) was used to compute the logistic regression results. A listwise deletion approach, also known as a complete case analysis (McKnight, McKnight, Sidani, & Figueredo, 2007), was used to omit those cases with missing data and is described below. The obvious downside of listwise deletion is that it discards potentially usable data, and the loss of data may lead to larger standard errors, wider confidence intervals, and a loss of power. The estimated standard errors, however, are usually accurate estimates of the true standard errors (Allison, 2002). Finally, the Taylor linearization method was used for variance estimation, and the Wald chi-square statistic tested significance.

Missing data procedures

Missing data procedures were undertaken for the two select cohorts to explore for potential bias. Logistic regression analyses were conducted on the missing cases alone (Appendix A). There were no significant results for missing attendee data with any of the three outcomes. For the missing non-attendee data, there were no significant results with the abuse outcome. For both suicide thoughts and attempts, however, adjusted odds ratios were significant for the age group 28–44. This finding would imply that the significant adjusted odds ratios for the non-attendees, that exclude missing cases, may underestimate the odds ratios for individuals aged 28–44 in this sample (Howell, 2009). Other missing data considerations included imputing missing data for outcome measures. This was not possible, as there were no repeated measures for the outcome variables or supplementary variables that could provide extra information about the incomplete measures. As a result, listwise deletion was the most appropriate approach to handle missing data (Allison, 2002).

Results

First Nations living On-Reserve

Table 1 describes the association (unadjusted odds ratios) between each explanatory variable and each of the three

outcomes for the entire sample. Nearly 39% of First Nations living On-Reserve reported having a history of abuse. Being female, non-partnered, having attended a residential school, and having a multigenerational exposure were significantly associated with having an abuse history. Twenty-eight percent of the sample had a history of suicide thoughts. Characteristics significantly associated with this history included: age 18–27, age 28–44, female sex, having no partner, and having a multigenerational residential school exposure. Fifteen percent of On-Reserve adults had a history of suicide attempts. Characteristics significantly associated with this history included: age 18–27 years, being female, having no partner, and a multigenerational exposure.

First Nations residential school attendees

Table 2 shows the association between each explanatory variable and each of the three outcomes for the attendee sub-sample. Nearly half (48.1%) of attendees reported an abuse history. Age 28–44 was significantly associated with this history, as well as negative effects of residential school attendance. Twenty-six percent reported a history of suicide thoughts, and an abuse history was significantly associated with this outcome. A suicide attempt history was reported by 14% of the sub-sample, and an abuse history was also significantly associated with this outcome.

First Nations who did not attend a residential school (non-attendees)

Table 3 depicts the association between each explanatory variable and each of the three outcomes for the non-attendee sub-sample. Abuse was reported by 37% of non-attendees. Characteristics significantly associated with abuse were age 18–27, age 28–44, female sex, being non-partnered, and multigenerational exposure. Thirty percent off the sub-sample reported a history of suicide thoughts. Characteristics significantly associated with this history were age 18–27, age 28–44, female sex, being non-partnered, a multigenerational exposure, and an abuse history. Sixteen percent reported a history of suicide attempts. Characteristics significantly associated with this history were female sex, multigenerational exposure, and an abuse history.

Table 1
Unadjusted odds ratios (OR) of explanatory variables for lifetime of abuse, suicide thoughts and suicide attempts of On-Reserve Manitoba First Nation adults.

	Abuse (N = 2562)		Suicide thoughts (N = 2688)		Suicide attempts (N = 2728)	
	N = yes (%)	Unadjusted OR (95% CI)	N = yes (%)	Unadjusted OR (95% CI)	N = yes (%)	Unadjusted OR (95% CI)
Outcome measure prevalence	994 (38.8)		757 (28.2)		413 (15.1)	
Age						
18–27	247 (40.5)	0.90 (0.62–1.29)	236 (37.2)	1.85 (1.28–2.68) [†]	122 (19.0)	1.58 (1.03–2.43) [‡]
28–44	408 (41.2)	0.88 (0.61–1.27)	346 (33.2)	1.74 (1.21–2.50) [†]	181 (17.1)	1.34 (0.90–1.99)
45+	339 (35.3)	–	175 (17.3)	–	110 (10.7)	–
Sex						
Male	328 (28.6)	–	290 (24.3)	–	138 (11.3)	–
Female	666 (47.1)	2.40 (1.93–2.97) [*]	467 (31.2)	1.43 (1.13–1.81) [†]	275 (18.2)	1.94 (1.50–2.51) [*]
Relationship status						
No partner	511 (40.2)	1.29 (1.01–1.63) [‡]	397 (29.7)	1.34 (1.06–1.69) [‡]	223 (16.6)	1.45 (1.10–1.91) [‡]
Partner	483 (37.4)	–	360 (26.6)	–	190 (13.7)	–
Attend a residential school						
No	734 (36.5)	–	615 (29.0)	–	339 (15.7)	–
Yes	260 (47.1)	1.82 (1.33–2.50) [§]	142 (25.0)	0.80 (0.60–1.08)	74 (13.0)	0.80 (0.53–1.20)
Multigenerational residential school survivor exposure						
No	388 (29.3)	–	267 (18.9)	–	147 (10.3)	–
Yes	606 (49.0)	1.92 (1.49–2.48) [*]	490 (38.5)	2.08 (1.52–2.85) [§]	266 (20.5)	1.72 (1.23–2.42) [†]

^{*}P < 0.0001; [§]P < 0.001; [†]P < 0.01; [‡]P < 0.05.

Table 2
Unadjusted odds ratios (OR) of explanatory variables for lifetime of abuse, suicide thoughts and suicide attempts of On-Reserve Manitoba First Nation adults who attended a residential school (*attendees*).

	Abuse (N = 507)		Suicide thoughts (N = 484)		Suicide attempts (N = 487)	
	N = yes (%)	Unadjusted OR (95% CI)	N = yes (%)	Unadjusted OR (95% CI)	N = yes (%)	Unadjusted OR (95% CI)
Outcome measure prevalence	244 (48.1)		126 (26.0)		67 (13.8)	
Age						
28–44	49 (50.0)	0.52 (0.30–0.89) [‡]	40 (42.6)	1.51 (0.86–2.66)	15 (15.8)	0.80 (0.28–2.27)
45+	195 (47.7)	—	86 (22.1)	—	52 (13.3)	—
Sex						
Male	101 (44.1)	—	47 (21.7)	—	25 (11.4)	—
Female	143 (51.4)	1.49 (0.88–2.51)	79 (29.6)	1.26 (0.73–2.18)	42 (15.7)	1.81 (0.86–3.83)
Relationship status						
No partner	114 (51.4)	1.35 (0.79–2.30)	55 (25.6)	1.38 (0.69–2.76)	34 (15.7)	1.74 (0.88–3.41)
Partner	130 (45.6)	—	71 (26.4)	—	33 (12.2)	—
Multigenerational residential school survivor exposure						
No	105 (43.0)	—	48 (20.7)	—	24 (10.4)	—
Yes	139 (52.9)	1.26 (0.79–1.99)	78 (31.0)	1.40 (0.72–2.70)	43 (16.8)	1.77 (0.74–4.24)
Negatively affected by attendance at residential school						
No	166 (62.9)	—	72 (29.3)	—	42 (16.9)	—
Yes	78 (32.1)	3.84 (2.13–6.95) [§]	54 (22.7)	1.16 (0.60–2.23)	25 (10.5)	1.26 (0.58–2.75)
Lifetime abuse						
No			28 (10.9)	—	14 (5.5)	—
Yes			98 (43.0)	4.66 (2.22–9.79) [§]	53 (22.9)	2.81 (1.28–6.17) [‡]

[§]P < 0.001; [‡]P < 0.05.

Logistic regression

First Nations living On-Reserve

Table 4 describes the results of logistic regression models for the full sample for all three outcomes. No interactions were found in the regression model. After adjusting for age, sex, relationship status, residential school attendance, and multigenerational exposure, First Nation females were at greater odds to have an abuse history. Non-partnered First Nations and those who had a multigenerational exposure were also likely to have this history. Residential school attendees were two times as likely to have an abuse history, but the result was less significant than the unadjusted odds ratio (from $P < 0.001$ to $P < 0.01$).

Young adults 18–27 and adults 28–44 years were more likely to have a history of suicide thoughts than those age 45 years and older. Being female, as opposed to male, was associated with this history. Higher odds for a suicide thought history was found

among those with a multigenerational exposure. The unadjusted and adjusted odds ratios were similar.

For suicide attempt history, again females were at greater odds than males. Those having no partner and those with multigenerational exposure were similarly at odds to have an attempt history. The association between attempt history and age 18–27 was no longer significant in the adjusted model.

First Nations adults who attended a residential school (*attendees*)

Table 5 describes the results of the logistic regression models for all three outcomes for the attendees. The regression model tested for interactions and none were found. After adjusting for age, sex, relationship status, and multigenerational exposure, a history of abuse was nearly four times greater for attendees who felt they had been negatively affected by their residential school experience compared to those who did not report negative effects.

Table 3
Unadjusted odds ratios (OR) of explanatory variables for lifetime of abuse, suicide thoughts and suicide attempts of On-Reserve Manitoba First Nation adults who did not attend a residential school (*non-attendees*).

	Abuse (N = 2010)		Suicide thoughts (N = 1877)		Suicide attempts (N = 1911)	
	N = yes (%)	Unadjusted OR (95% CI)	N = yes (%)	Unadjusted OR (95% CI)	N = yes (%)	Unadjusted OR (95% CI)
Outcome measure prevalence	734 (36.5)		555 (29.6)		309 (16.2)	
Age						
18–27	247 (40.5)	1.65 (1.11–2.43) [‡]	209 (36.9)	2.10 (1.27–3.45) [†]	107 (18.7)	1.66 (0.99–2.79)
28–44	353 (40.1)	1.61 (1.11–2.33) [‡]	276 (33.8)	2.16 (1.30–3.59) [†]	154 (18.5)	1.60 (0.91–2.82)
45+	134 (25.8)	—	70 (14.2)	—	48 (9.5)	—
Sex						
Male	221 (24.7)	—	209 (25.3)	—	103 (12.1)	—
Female	513 (46.0)	2.81 (2.10–3.76) [*]	346 (32.9)	1.44 (1.07–1.94) [‡]	206 (19.4)	1.90 (1.36–2.63) [§]
Relationship status						
No partner	390 (38.0)	1.36 (1.03–1.80) [‡]	302 (31.4)	1.32 (1.03–1.69) [‡]	168 (17.3)	1.32 (0.97–1.80)
Partner	344 (34.9)	—	253 (27.6)	—	141 (15.0)	—
Multigenerational residential school survivor exposure						
No	275 (26.1)	—	194 (19.5)	—	113 (11.2)	—
Yes	459 (48.0)	2.06 (1.58–2.69) [*]	361 (40.9)	2.06 (1.50–2.84) [§]	196 (21.7)	1.59 (1.08–2.34) [‡]
Lifetime abuse history						
No			168 (14.1)	—	68 (5.6)	—
Yes			387 (56.7)	6.56 (4.42–9.73) [*]	241 (34.7)	6.55 (3.95–10.88) [*]

^{*}P < 0.0001; [§]P < 0.001; [†]P < 0.01; [‡]P < 0.05.

Table 4

Logistic regression analysis of lifetime of abuse, suicide thoughts and suicide attempts of On-Reserve Manitoba First Nation adults.

	Abuse N = 2562	Suicide thoughts N = 2688	Suicide attempts N = 2728
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Age			
18–27	1.06 (0.70–1.61)	1.58 (1.06–2.35) [‡]	1.29 (0.81–2.05)
28–44	1.16 (0.81–1.66)	1.75 (1.19–2.59) [‡]	1.33 (0.92–1.93)
45+	Ref	Ref	Ref
Sex			
Male	Ref	Ref	Ref
Female	2.50 (2.00–3.13) [*]	1.46 (1.14–1.87) [‡]	1.94 (1.49–2.54) [*]
Relationship status			
No partner	1.37 (1.03–1.81) [‡]	1.30 (1.03–1.65) [‡]	1.40 (1.03–1.92) [‡]
Partner	Ref	Ref	Ref
Attended residential school			
No	Ref	Ref	Ref
Yes	2.00 (1.36–2.93) [‡]	0.99 (0.70–1.39)	0.90 (0.57–1.42)
Multigenerational residential school survivor exposure			
No	Ref	Ref	Ref
Yes	1.88 (1.47–2.41) [*]	2.02 (1.51–2.70) [§]	1.68 (1.21–2.34) [‡]

* $P < 0.0001$; [§] $P < 0.001$; [‡] $P < 0.01$; [‡] $P < 0.05$.

For a history of suicide thoughts, the unadjusted model for age was not significant, but in the adjusted model, First Nations aged 28–44 were two times more likely to have had a history of suicide thoughts. The odds of having this history were even greater for those with an abuse history. Taken together, attendees between the ages of 28–44 who were abused were even more likely than the older age group, 45 years and older, who did not have a history of abuse to have ever experienced suicide thoughts. In the adjusted model, abuse history was increased with a suicide attempt history (from $P < 0.05$ to $P < 0.01$).

First Nations adults who did not attend a residential school (non-attendees)

Table 6 describes the results of the logistic regression models for all three outcomes for non-residential school attendees. An

Table 5

Logistic regression analysis of lifetime of abuse, suicide thoughts and suicide attempts of On-Reserve Manitoba First Nation adults who attended a residential school (attendees).

	Abuse N = 507	Suicide thoughts N = 484	Suicide attempts N = 487
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Age			
28–44 years	0.66 (0.34–1.29)	2.16 (1.17–4.00) [‡]	1.01 (0.32–3.16)
45+	Ref	Ref	Ref
Sex			
Male	Ref	Ref	Ref
Female	1.58 (0.91–2.74)	1.12 (0.64–1.96)	1.60 (0.85–2.98)
Relationship status			
No partner	1.29 (0.70–2.41)	1.36 (0.68–2.73)	1.67 (0.85–3.29)
Partner	Ref	Ref	Ref
Multigenerational residential school survivor exposure			
No	Ref	Ref	Ref
Yes	1.16 (0.71–1.89)	1.37 (0.66–2.81)	1.71 (0.72–4.07)
Negatively affected by attendance at residential school			
Yes	3.83 (2.09–7.02) [*]	0.71 (0.35–1.44)	0.94 (0.39–2.23)
No	Ref	Ref	Ref
Lifetime abuse			
No	—	Ref	Ref
Yes	—	5.89 (2.61–13.27) [§]	2.67 (1.21–5.89) [‡]

* $P < 0.0001$; [§] $P < 0.001$; [‡] $P < 0.01$; [‡] $P < 0.05$.

Table 6

Logistic regression analysis of lifetime of abuse, suicide thoughts and suicide attempts of On-Reserve Manitoba First Nation adults who did not attend a residential school (non-attendees).

	Abuse N = 2010	Suicide thoughts N = 1877	Suicide attempts N = 1911
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Age			
18–27 years	1.30 (0.85–1.98)	3.35 (1.87–5.98) [§]	2.41 (1.10–5.30) [‡]
28–44 years	1.58 (1.09–2.30) [‡]	4.33 (2.37–7.89) [*]	2.41 (1.10–5.31) [‡]
45+	Ref	Ref	Ref
Sex			
Male	Ref	Ref	Ref
Female	2.95 (2.18–3.99) [*]	0.92 (0.66–1.30)	1.28 (0.88–1.87)
Relationship status			
No partner	1.43 (1.03–1.98) [‡]	1.15 (0.85–1.56)	1.14 (0.80–1.62)
Partner	Ref	Ref	Ref
Multigenerational residential school survivor exposure			
No	Ref	Ref	Ref
Yes	2.05 (1.58–2.65) [*]	5.38 (2.57–11.27) [*]	2.94 (1.27–6.82) [‡]
Lifetime abuse			
No	—	Ref	Ref
Yes	—	6.24 (4.24–9.17) [*]	5.86 (3.53–9.73) [*]
Age × exposure to a multigenerational residential school survivor			
18–27 years	—	0.26 (0.11–0.63) [‡]	0.33 (0.11–0.95) [‡]
28–44 years	—	0.21 (0.08–0.58) [‡]	0.34 (0.12–0.95) [‡]

* $P < 0.0001$; [§] $P < 0.001$; [‡] $P < 0.01$; [‡] $P < 0.05$.

interaction between age and multigenerational exposure was found for a history of suicide thoughts and attempts; therefore, these interaction terms were included in the models for those outcomes.

For non-attendees, the association between age and a lifetime history of abuse changed between the unadjusted and adjusted model. While the odds for having this history decreased for those aged 28–44, the level of significance increased to $P < 0.01$. The age group 18–27 years was no longer significant in the adjusted model. For the remaining variables, the unadjusted and adjusted odds ratios were similar. The odds of having an abuse history were higher for females, and greater for individuals who did not have a partner. Non-attendees with multigenerational exposure were twice as likely to have an abuse history than those with no multigenerational exposure. When combined, females with a multigenerational exposure were even more likely than males without any exposure to have experienced abuse. As well, having an abuse history was even greater for females, age 28–44 with a multigenerational exposure.

Non-attendees with an abuse history were over six times more likely to have a history of suicide thoughts. Having a history of suicide thoughts for the age group 18–27 did not significantly change from the unadjusted to adjusted model. There was, however, a significant two-fold increase from the unadjusted to adjusted models for those aged 28–44. In the final model, this age group was more than four times more likely than either younger or older age groups to have a history of suicide thoughts.

Due to the interaction between age and multigenerational residential school exposure, those 18–27 years with this exposure were more likely to have a history of suicide thoughts compared to the same age group with no exposure. The odds were similar for those aged 28–44 years who had this exposure compared to the same age group who did not have this exposure. Those 45 years and older who had a multigenerational exposure, however, were over five times more likely than the same age group who did not have this exposure to have a history of suicide thoughts. Fig. 1 illustrates this pattern. The gap in the predicted probability between those individuals with a parent or grandparent who

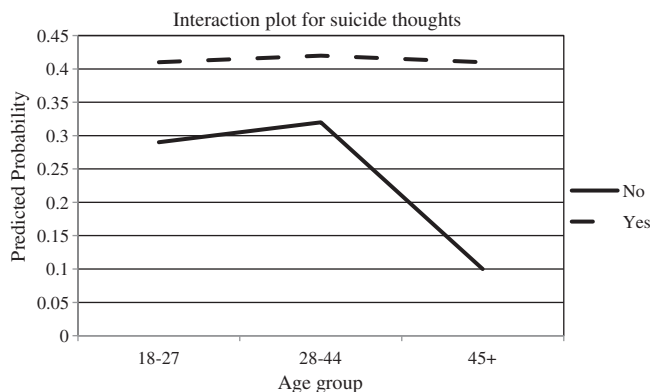


Fig. 1. Interaction plot for age \times multigenerational exposure for suicide thoughts (no, multigenerational; yes, multigenerational).

attended a residential school (upper line) and those who did not (lower line) became wider as age increased. This is illustrated by the higher odds ratio for the older age group relative to the younger age group who had this exposure. After adjusting for the age interaction, an abuse history coupled with multigenerational exposure greatly increased the likelihood of suicide thoughts for those age 18–27 years, age 28–44 years, and even more so for those 45 years and older (additive effect).

From the unadjusted to adjusted model, non-attendees with an abuse history were nearly six times more likely to have a history of suicide attempts. The odds of a suicide attempt history significantly increased for those with a multigenerational exposure. In the unadjusted model, age was not significantly associated with suicide attempts for non-attendees. In the adjusted model, however, non-attendees in both age groups, 18–27 years and 28–44 years, were over two times more likely than non-attendees over age 45 to have a history of suicide attempts. Due to the interaction between age and multigenerational exposure, those age 18–27 or 28–44 years who had this exposure were not significantly different than their counterparts who did not have this exposure. However, those 45 years and older who had a multigenerational exposure were nearly three times more likely than those of the same age group who did not have this exposure (Fig. 2). After adjusting for the age and multigenerational exposure interaction, non-attendees aged 45 and older who had also experienced abuse (additive effect) were seventeen times more likely to have an attempt history than younger individuals who did not have a multigenerational exposure and were not abused.

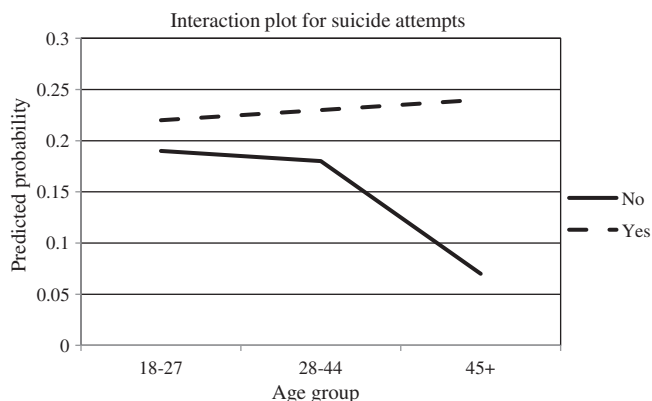


Fig. 2. Interaction plot for age \times multigenerational exposure for suicide attempts (no, multigenerational; yes, multigenerational).

Discussion

To our knowledge, this study is the first to use a representative indigenous population sample (Manitoba First Nation adults living On-Reserve) to empirically explore trauma pathways of suicide ideation and attempt history, with an emphasis on understanding the hypothesized link between a lifetime of abuse and a history of suicidality and a direct or indirect exposure to the residential school system.

In our full sample of On-Reserve First Nation adults, we found that females were more likely than males to report a history of abuse, suicide thoughts and suicide attempts, and the same was true for individuals who did not have a partner. While research has supported a male risk or being single for suicide (Wexler, Hill, Bertone-Johnson, & Fenaughty, 2008), recent studies have reported a female risk for abuse and poor mental health in stressful environments (Arbuckle et al., 1996; Evans-Campbell et al., 2006; Manson et al., 2005). Having a history of suicide thoughts and attempts was also more apparent among the younger age groups, which is consistent with the pattern of suicide risk in Canada's First Nations population (Kirmayer et al., 2000). The association between multigenerational exposure and a history of abuse, suicide thoughts and suicide attempts also suggests that poor parenting or trauma transmission may have occurred (Evans-Campbell, 2008). Surprisingly, residential school exposure was only associated with having a history of abuse, suggesting that a mentally healthy residential school survivor cohort may be present in these communities.

To disentangle trauma history in this population, our cohort approach was very informative. Among the sub-sample of residential school attendees, those who viewed their exposure to a residential school as having had a negative effect on their well-being were more likely to have an abuse history, while those who did not report negative effects seemingly did not have this history. This finding is consistent with theories and research on resilience among some residential school survivors (Chrisjohn & Young, 1997; Denham, 2008; Dion Stout & Kipling, 2003; Stout & Peters, 2011). Surprisingly, in the residential school attendee sub-sample, multigenerational exposure was not associated with an abuse history. We can speculate that, for a child, regardless of age or gender, a direct exposure to residential school that resulted in a negative experience may have superseded any trauma transmission effects between residential school survivors and their children who had also attended (Evans-Campbell, 2008).

Attendees with an abuse history were likely to have a history of suicide thoughts and suicide attempts. We expected to find an association of both negative impacts of residential school and multigenerational exposure in relation to suicide behaviour histories. In this sub-sample, when we adjusted for negative impacts and abuse history against suicide thoughts, only abuse history remained significantly associated, and attendees aged 28–44 who were abused were more likely to have a history of suicide thoughts than the 45 years and older group who did not have an abuse history. Life histories of residential school survivors, recently documented by Stout and Peters (2011) in an intergenerational study, illustrate the power of abuse histories in shaping poor mental health. The other important finding suggests that the older attendee group, who did not report a complex trauma history, would appear to be the more resilient group. This age group's resiliency, however, may not protect them from future ideation risk. The chronic stress they may have experienced as attendees may still predispose them to cope ineffectively as they age (Kirmayer et al., 2007). Of equal concern is the younger but high-risk survivor cohort, who, as they age, may also be at risk, which has been observed among high-risk, ageing holocaust survivors (Barak,

2007; Clarke et al., 2004). A recent, limited retrospective chart study has shown such risk among Canada's residential school survivors who had sought mental health services for trauma symptoms (Corrado & Cohen, 2003).

As we had predicted, abuse history for non-attendees was more likely for those who reported multigenerational residential school exposure. We can speculate that poor parenting may have contributed to this abuse history (Evans-Campbell, 2008; Stout & Peters, 2011). First Nation women non-attendees, as opposed to the men, were also more likely to have a history of abuse. The odds of having this history were even greater for women, age 28–44 with a multigenerational exposure. This finding could suggest that female children of residential school survivors are more likely to be victims of abuse, and potentially could be at risk for experiencing abuse operating at both the family and community level (Evans-Campbell et al., 2006; Réaume & Macklem, 1994).

We correctly predicted that non-attendees who experienced either multigenerational exposure or abuse were more likely to have a history of suicide behaviours. In terms of multigenerational exposure, this finding would again suggest that trauma transmission from a parent or grandparent might have occurred. Those 45 years and older who also had multigenerational exposure were more likely to have suicide behaviour history, as opposed to those who did not have that exposure and were younger. This finding suggests that multigenerational trauma transmission may have had an impact on the wellbeing of this ageing cohort. When we considered abuse history, the odds of a suicide behaviour history were dramatically higher for the older age group who also had multigenerational exposure. Whether this group is at risk for future ideation and attempts is not clear. Suicide risk tends to increase with ageing and the development of common and multiple chronic diseases (Juurlink, Herrmann, Szalai, Kopp, & Redelmeier, 2004). We could hypothesize that the ageing non-attendee group may have an increased risk for future suicide risk, as they develop complex co-morbidities, in addition to this multigenerational exposure, abuse history, and past ideation or attempts. Findings from a study of an opportunistic sample of 75 First Nations supports this possible trajectory, particularly for residential school offspring who already have increased susceptibility for stressor-related depressive symptoms due to childhood adversity, adult trauma and perceived discrimination (Bombay, Matheson, & Anisman, 2011).

Overall, our research suggests that while some residential school attendees have survived well, others have a complex trauma history that includes abuse and suicide behaviours. For non-attendees, exposure to parents or grandparents who attended a residential school and/or having a lifetime of abuse were two critical pathways to understand suicide behaviour histories. In short, our research suggests that direct and indirect effects due to historical trauma were operating at the individual, family and community level.

The addition of these empirical findings to a largely qualitative and theoretical literature is therefore novel. The study had limitations common to cross-sectional surveys. The outcome measures are based on self-reports and may underestimate the true prevalence of a lifetime of abuse, suicide thoughts, and suicide attempts. Misreporting or not reporting on sensitive topics, such as interpersonal violence and mental health issues, is also quite common and is largely situational in surveys (Tourangeau & Yan, 2007). Given that this survey was a regional On-Reserve population health survey, with no explicit focus on residential school exposures, abuse or mental health issues, refusals to participate in the survey were not directly related to a sensitive thematic survey. As for missing values for the outcome measures, missed responses may have been due to the challenges community members face in

disclosing information on sensitive topics to a community interviewer. Indeed, selection bias is common in surveys for such questions as respondents will edit or miss information to avoid embarrassing themselves in the presence of a community interviewer (Aday & Llewellyn, 2006).

Another limitation of this study is that we were not able to temporally situate these histories. For residential school survivors, we were not able to determine whether the abuse they had experienced had occurred prior to a residential school exposure, during their stay in a school, or after they left the school. As well, we did not know the quality of the exposure (positive versus negative) the respondents had with parents or grandparents who had attended a residential school. Furthermore, respondents may not have known whether their parents or grandparents had attended a residential school. Such knowledge is not always shared with offspring, due to a conspiracy of silence which has been noted in other mass trauma studies (Danieli, 1998).

While this study has demonstrated that there is a legacy of historical and contemporary trauma, particularly in relation to a history of suicide thoughts and attempts, further research is required. While the Diagnostic and Statistical Manual of Mental Disorders (DSM III) identifies a number of traumatic events or effects, it does not recognize colonization, ongoing colonizing practices, and multigenerational trauma as legitimate traumatic events or effects (Evans-Campbell, 2008). Yet, indigenous peoples have embraced multilevel trauma frameworks to acknowledge and contextualize the colonial injustices they experienced and have promoted the importance of describing traumatic experiences in terms of connectedness, collectivity and relationships (Krieg, 2009). Additional research is urgently needed to investigate this dynamic, with particular attention given to residential school intergenerational effects at the individual, family and community level. More studies are also required to expand our understanding of impacts of the residential school system by distinguishing and measuring residential school syndrome, historical trauma and intergenerational trauma among individuals, families and communities (Robertson, 2006), with particular attention to gender (Evans-Campbell et al., 2006; Oetzel & Duran, 2004). Also, we need to know more about internalized and externalized resiliency and cultural continuity in relation to historical and contemporary trauma (Chandler & Lalonde, 2008; Evans-Campbell, 2008; Mota et al., in press). In addition, more focused studies are required to distinguish historical trauma and historical trauma response, as illustrated by Denham (2008) in his qualitative study of the potential for alternative and potentially resilient expressions to trauma by indigenous individuals, families and communities. To complement this work, more mixed methods studies (qualitative and quantitative) focused on developing and testing existing and new measures of historical and contemporary trauma in indigenous populations, accounting for gender, are required following the ground-breaking work of Whitbeck, Adams, Hoyt, and Chen (2004). In such future research, it is important that traumatology does not usurp cultural understanding, which means that indigenous perspectives are necessary to transform the theory, research and practice of traumatology (Hill, Lau, & Wing Sue, 2010).

Conclusion

These findings make a major contribution to the literature and also have important policy and mental health service research implications for First Nation individuals, families and communities, above and beyond current efforts underway in Canada to make amends for the residential school system. In June 2008, the Canadian federal government publically apologized to Canada's Indigenous peoples for the harm indigenous peoples experienced as

a result of the federal government residential school policy. The Indian Residential Schools Settlement Agreement, implemented in 2001, has provided a common experience payment to survivors and extended counselling services to survivors and family members. Through the Indian Residential Schools Resolution Health Support Program, Health Canada First Nations and Inuit Health provides mental and emotional support services to residential school survivors and their families. This support has been provided during and after they participated in the Settlement Agreement process, during the Common Experience Payments, the Independent Assessment Process, Truth and Reconciliation Commission events, and Commemoration activities. Currently, there is a major endeavour by the National Truth and Reconciliation Commission to create and extend a living public document of the impacts of the residential schools system. This research adds to the public record, but more research will be required to document this legacy and the healing that will take place.

Acknowledgements

This research was supported by the Canadian Institutes of Health Research (MOP-79372). Dr. Brenda Elias is supported by a CIHR New Investigator award, and Dr. Jitender Sareen is supported by a Manitoba Health Research Council Chair award. The Manitoba First Nations Regional Longitudinal Health Survey was a joint initiative of the Assembly of Manitoba Chiefs and the Manitoba First Nations Centre for Aboriginal Health Research (Dr. Brenda Elias). The results and conclusions are those of the authors and no official endorsement by the Assembly of Manitoba Chiefs is intended or should be inferred.

Appendix. Supplementary material

Supplementary material related to this article can be found online at doi:10.1016/j.socscimed.2012.01.026.

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