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Racism and Oral Health Outcomes among Pregnant Canadian Aboriginal Women

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Abstract: This study assessed links between racism and oral health outcomes among pregnant Canadian Aboriginal women. Baseline data were analyzed for 541 First Nations (94.6%) and Métis (5.4%) women in an early childhood caries preventive trial conducted in urban and on-reserve communities in Ontario and Manitoba. One-third of participants experienced racism in the past year determined by the Measure of Indigenous Racism Experience. In logistic regressions, outcomes significantly associated with incidents of racism included: wearing dentures, off-reserve dental care, asked to pay for dental services, perceived need for preventive care, flossing more than once daily, having fewer than 21 natural teeth, fear

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of going to dentist, never received orthodontic treatment and perceived impact of oral conditions on quality of life. In the context of dental care, racism experienced by Aboriginal women can be a barrier to accessing services. Programs and policies should address racism's insidious effects on both mothers' and children's oral health outcomes.

Key words: Racism, discrimination, oral health, dental services accessibility, dental care disparities, Aboriginal peoples, pregnant women.

Aboriginal Canadians include the First Nations, Inuit and Métis peoples, as defined in Section 35(2) of the *Canadian Constitution Act* of 1982. Based on the 2011 National Household Survey conducted by Statistics Canada, there were 1,400,685 people in Canada who self-identified as Aboriginal, representing 4.3% of Canada's total population.[1] The majority of Aboriginal Canadians self-identify as First Nations (an estimated 851,560 in 2011) and approximately half of those reside on reserves. However, many people who self-identify as Aboriginal are not registered under Canada's *Indian Act* of 1876, which, to date, defines who is considered a "status Indian" and thus eligible for a range of programs and services offered by federal agencies. These health benefits include community health programs delivered on reserve, prescription drugs and dental coverage. People who identify as First Nations but who are not a "Registered Indian" according to the federal government are considered "non-status Indians" and are not eligible for these benefits. It should be noted that the criteria used to determine who is and is not a "status Indian" have never been sanctioned by the Aboriginal peoples of Canada.[2] In 2011, Statistics Canada reported that there were 213,900 First Nations people who were not Registered Indians in Canada, representing 15.3% of the total Aboriginal population.[1] Approximately three-quarters of this population live in urban centers across the country.[3]

Despite variations in the traditions and cultures of First Nations, Inuit and Métis peoples and between status and non-status, on reserve and off-reserve, as well as urban and rural Aboriginal populations, numerous and persistent health disparities exist between Aboriginal and non-Aboriginal Canadians (for a review see *The State of Knowledge of Aboriginal Health*).[4] Many, if not most of these health disparities are deeply rooted in social, economic, cultural and political inequities, often referred to as "the social determinants of health."[5,6]

This article focuses on one of the core determinants of Aboriginal peoples' health, namely the social experience of racism, defined according to the *Oxford English Dictionary* as the "belief that all members of each race possess characteristics, abilities, or qualities specific to that race, especially so as to distinguish it as inferior or superior to another race or races."[7] Charlotte Reading in her paper on racism and Aboriginal Canada, offers a more nuanced definition, asserting that

> [r]acism is a pervasive condition capable of poisoning the perceptions of everyday people and corrupting the structure of entire societies. It is perpetrated by strangers and colleagues, and sometimes even by friends; it happens in grocery stores and halls of justice and even in places of worship. It has condemned entire nations and countless generations of people to untold suffering. Whether subtle or overt, racism

> commits assault on the minds, spirits and even the bodies of those racialized and consequently marginalized to 'minority' status.[8[p.9]]

Racism, which is considered a "distal"[9] social determinant of health among Aboriginal peoples along with colonialism and the repression of self-determination, has resulted in historical and contemporary trauma that has touched generations of Aboriginal peoples in Canada.[6] Colonialism had a detrimental impact on the health of Aboriginal peoples by producing a range of social, political and economic inequalities. This process began when Aboriginal peoples were dispossessed of, and displaced from, their traditional lands over the course of a number of centuries following the arrival of European settlers.[10] In the late 19th and 20th century further efforts to assimilate and acculturate Indigenous peoples continued to exacerbate these inequalities. Notably the most powerful mechanism of assimilation was the residential school program established by the federal government and the Catholic and Anglican churches around 1880 which ran through to 1996 and forcibly removed several generations of Aboriginal children from their families and communities in order to "educate and civilize" them.[11] Through these schools, the culture, language, family ties and community networks of generations of First Nations, Métis and Inuit children were eroded and the ramifications of the residential schools are still felt today.[12–16]

Another form of racism that has occurred at the structural (macro) level in Canada was the establishment of "Indian reserves," which are lands set aside for residence of status Indians, generally located in remote and isolated areas, but not determined by or in consultation with, Indigenous peoples. Indeed, the existence of Indian reserves is an overt form of racialized segregation connected with marginalization of socioeconomic opportunities as well as health and social services.[15,16] This segregation, compounded with inadequate federal investment in the social and economic development of First Nations reserves and Inuit communities, have resulted in absolute as well as relative poverty in these communities when compared with non-Aboriginal Canadian communities.[15]

All forms of racism, whether on an interpersonal, structural or institutional level, are acutely felt by many Aboriginal people in Canada. For example, in the First Nations Regional Health Survey (RHS) of 2008–10, approximately one-third (32.6%) of First Nations adults living on-reserve or in northern communities reported experiencing instances of racism in the 12 months prior to the date of asking.[17] This figure represents a slight decrease from the proportion in the 2002–03 RHS (37.9%).[18] Furthermore, 32.6% of those who reported experiencing racism felt that such experiences had some, or a strong, impact on their level of self-esteem.[17] Psychological distress was also 1.4 times more likely to be experienced by those who encountered racism in the year prior to the survey.[17]

The wear and tear of racism and discrimination in everyday life is also evidenced among other racialized groups in Canadian society. In the Canadian Community Health Survey of 2003, there were sizable and often statistically significant relative risks for diabetes, hypertension and fair/poor self-rated health for respondents identifying as Aboriginal, Aboriginal/White, Black, Filipino, or South Asian, relative to respondents identifying as White, with most of these health disparities unable to be explained away by residential locale or differences in socioeconomic status.[19]

As social determinants strongly influence population health, it is not surprising that the world's Indigenous people have low standards of health, particularly when compared with the dominant racial/cultural group in their respective countries. A common history of colonialism and the resulting economic, social, and cultural marginalization that accompanied it have profoundly affected the health of Indigenous peoples not only in Canada but also around the world.[20,21] Findings from contemporary national health surveys conducted in New Zealand and Australia indicate that Māori and Australian Aboriginal and Torres Strait Islander adults are subjected to high levels of racism across a wide variety of settings and that the prevalence of self-reported experience of racial discrimination is associated with multiple health outcomes, in addition to socioeconomic measures and indicators of cultural identity and participation.[22–27] There is also strong evidence of a dose-response relationship between the number of reported types of racial discrimination or settings in which such discrimination took place and each health outcome measure.[22,27] This is consistent with an understanding of racism as a causal determinant of health that leads to inequalities in health between Indigenous and non-Indigenous people.

The health-harming effects of racism also can be observed where the oral health of Indigenous populations is concerned. Although oral health is an integral component of overall health and well-being, there are only a handful of studies that have looked at the association between racial discrimination experienced by Indigenous peoples and oral health-related outcomes.[28–31] Most of the research has come from Australia and reported that experiencing discrimination was associated with anxiety, depression, suicide risk and overall poor mental health in a birth cohort of young Australian Aboriginal adults residing in the Northern Territory.[28] Relevant to this paper, race-based discrimination also had a role to play in access to dental services among this population, as the only significant association with having never visited a dentist before was self-reported discrimination.[29]

In the case of pregnant Aboriginal Australians, high levels of self-reported racism were found to be associated with non-optimal tooth brushing behaviours, and this association was mediated by high levels of perceived stress.[30] Using the same analytical approach in a separate publication, the investigators reported that high levels of self-reported racism were associated with toothache experience and that low levels of sense of personal control, but not perceived stress, mediated the association between self-reported racism and experience of toothache among this sample of pregnant Australian Aboriginal women.[31]

Racism, particularly in the health care experience of Aboriginal peoples in Canada, erects a serious barrier to accessing care that can lead to delayed treatment or lack of treatment altogether.[32] This may partly explain why a high proportion of Indigenous people attend for dental care only when problems arise (e.g., toothache). For Canadian Aboriginal women with children, the anticipation of being perceived as bad mothers due to racist assumptions by health care providers and/or the fear of child welfare intervention have been reported to influence their decisions to forego health care for themselves and their children.[33,34] Like the Australian oral health studies cited above, this paper looks at interpersonal racism and not at structural or institutional racism (also known as systemic racism) *per se*, but it includes discriminatory treatment in health

care settings by doctors, dentists, nurses, or other staff at hospitals, dental clinics, or doctors' offices. It is important to consider the ways in which racism is experienced among a range of Indigenous peoples in order to advocate for culturally safe health programming, policies, and services, including oral health care for mothers and their young children.

We hypothesized that the interpersonal experience of racism also affects the oral health of pregnant Aboriginal women in Canada and we set out to (i) assess whether there were associations between oral health-related outcomes and self-reported racism and (ii) if they existed, whether associations between oral health-related outcomes and self-reported racism persisted after adjusting for significant covariates in our sample. Other objectives of the study were (iii) to compare the prevalence of self-reported racism among the three countries collaborating on an early childhood caries preventive trial, and (iv) to compare the findings with prevalence estimates reported in First Nations-governed, national health surveys in Canada.

Methods

The term "Aboriginal" is used throughout this paper to denote the First Nations (including status/non-status Indians), Inuit and Métis peoples as it is the least contentious and most inclusive general term currently used in Canada. The terms "First Nations" and "Métis" are used to reference these peoples specifically, while the term "Indigenous" is used to describe Aboriginal peoples in an international context, in particular when the findings of this study are compared with corresponding data from Australia and New Zealand.

Study design and participants. This research is nested in the "Baby Teeth Talk" (BTT) Study, a community-based early childhood caries (ECC) randomized controlled trial, which is testing a multi-pronged behavioural and preventive intervention among 544 pregnant Canadian Aboriginal women and their children living in urban and on-reserve communities in the provinces of Ontario and Manitoba (ClinicalTrials.gov Identifier: NCT02151916). The Baby Teeth Talk Study is a multi-national collaboration among researchers and Indigenous health and social service providers and partners in Canada, New Zealand and Australia. The same study design and methodology are being utilized in the three collaborating countries.[35,36] The study adopted a community-based participatory research model in which each community was engaged in a process of relationship and trust building through either pre-existing ties with the investigators or through newly formed partnerships (for a list of research partners, see Acknowledgements). Key to the model are our community-based researchers (CBRs) who were recruited and trained to carry out the interventions and collect and enter the data. The CBRs, most of whom are First Nations from the study communities, have been critical in promoting the study and are the lens through which the experiences of BTT participants are assessed and analyzed. Recruitment occurred from August 2011 to late November 2012 at the study sites (for a list of study sites, see Acknowledgements). For the purpose of the present research, only data collected at the time of recruitment (second trimester of pregnancy) were used. The questionnaires were completed through face-to-face interviews or via video-conferencing at the recruitment sites or in the participant's home.

The scripted questionnaire was pilot tested among the team of investigators and CBRs and by Aboriginal community members and was revised accordingly. Approximately 64% (349) of the respondents also participated in a dental screening examination at the time of recruitment. The examinations were conducted on-site by trained dentists and staff dental hygienists who were blinded to the intervention group assignment.

Measures. The selection of variables used for data analysis was guided by a definition of wellness as it is understood by First Nations peoples. That definition comprises physical (body), mental (mind), emotional (heart), and spiritual (spirit) elements. Essentially, being "healthy" reflects balance among these elements, with personal wellness linked to other familial, communal, and environmental factors.[37] In accordance with this holist notion of balance among the four aspects of wellbeing, our indices of oral health status reflected the physical aspect of personal wellness, whereas the independent variables reflected the other dimensions of wellness.

Oral health status. Oral health status data reported in this paper were primarily collected through self-report, though clinically-determined data are reported for edentulism (complete tooth loss), number of teeth, prosthetic and orthodontic treatment status. The threshold for a functional dentition was set at 21 or more natural teeth and is consistent with the classical concept of the "shortened dental arch" (SDA), which involves the individual being able to function with 10 pairs of occluding teeth.[38]

Oral health-related quality of life. The social impact of oral conditions on Aboriginal women's quality of life was measured with seven frequency-response items derived from the 14-item Oral Health Impact Profile (OHIP-14).[39] The first four items asked participants how often in the last year had they experienced "toothache or pain in the mouth," "bleeding gums when brushing," "chronic dry mouth" and "chronic bad breath." The following three items evaluated the frequency with which problems with teeth, dentures or gums produced varying levels of psychological discomfort (uncomfortable at work, school or in social situations), functional limitation (not able to eat some foods or had to eat them slowly), and social disability (missed work, school or took time away from normal activities). Responses were made on a five-point ordinal scale ranging from "never" to "very often." The distribution of total scale scores for the study sample was dichotomized at the 15th percentile as per sensitivity analysis and categorized as "low/moderate" and "high" impact on quality of life.

Perceived need for and access to dental care. The CBRs asked a number of questions seeking information on self-perceived dental care needs and whether care was needed urgently (*i.e.*, dental problems requiring immediate attention). Access to dental care among pregnant Aboriginal women focused on the time since the last dental visit and on the usual pattern of visits to a dental professional (dentist, dental hygienist or dental therapist), *i.e.*, for check-ups and treatment or emergency care. Participants were also asked where they would go for dental care, whether they suffer from dental phobia, and if they had to pay upfront for dental services.

Preventive oral health care behaviours. Participants were asked about tooth brushing and flossing habits and the responses were dichotomized according to professional recommendations.

Self-rated oral and general health. A single-item global self-rated oral health question "In general would you say the health of your mouth, including teeth or dentures,

tongue, gums, lips, and jaws joints, is . . . ," with ordinal responses labelled "excellent," "very good," "good," "fair," and "poor." Ordinal responses were collapsed to form a binary variable comprising categories of "good" and higher levels versus "fair" and "poor." A similar question with identical response options assessed the participant's self-rated general health. Self-rated general health was included among the covariates as it could affect the relationship between oral health and self-reported racism (the independent variable of primary interest).

Self-reported racism. Survey participants were first asked whether they had personally experienced any instances of racism in the 12 months prior to the survey. This was the same question asked in the 2008–10 RHS.[17] Those who answered "yes" were asked if they felt that they had been treated unfairly in nine mutually exclusive settings because they were Aboriginal (First Nations/Métis). The settings were: employment, domestic, educational/academic, recreational/leisure, law (enforcement), health care, government service provision, other service provision, public and any other situation (re-categorized according to the other 9 settings where relevant). This multi-item question is part of the Measure of Indigenous Racism Experiences (MIRE) instrument, which was developed to assess self-reported interpersonal racism among Indigenous Australians.[40] Minor language-related revisions were made to the MIRE to render some items more relevant to the Canadian context. The adapted version of the MIRE also included a specific timeframe for measuring exposure to racism, namely the preceding 12 months prior to the survey, in contrast to the original version that does not include an explicit timeframe for measuring that exposure. In addition, the item response options were "yes" or "no" unlike the original version of the instrument that asked respondents to identify the frequency of such experiences. For each participant, a self-reported racism summary score variable was computed for the number of settings in which racism was experienced, with each "yes" reply scored as 1. The total summary score variable possible range was 0–9. However, the summary score variable had a positive skewed distribution, with 67.7% of the participants reporting no racism (*i.e.*, racism experienced in zero settings). Thus, the summary score variable was divided into two levels: "no perceived racism" as compared with "racism experienced in at least one setting." The summary score variable was also categorized as "low racism" (experiences of racism in 0–3 settings) and "high racism" (experiences of racism in 4–9 settings) so as to allow for comparisons with estimates from Australia and New Zealand.

Covariates. Common correlates of racism were also assessed including, mother's age, level of education, Aboriginal identity and Indian status, place of residence, employment status and primary source of income. Moreover, to determine household occupancy, respondents were asked to indicate how many children, adolescents and adults live in the household at least half of the time. The number of rooms in the household was also asked to calculate the overcrowding index, defined in the RHS(s) as more than one person per habitable room. Measures of indigeneity and participation in cultural traditions, psychosocial scales of social support and psychological stress, and lifestyle questions about smoking and drug and alcohol use were included, as described below.

Aboriginal identity and traditional culture. Aboriginal identity and whether participants had Indian status were simultaneously assessed with a single item that asked participants if they were "Status First Nations" (*i.e.*, Registered Indian), "Non-Status

First Nations," "Inuit," "Métis," or "other." Participants also were asked how important their culture and ethnicity were to them, and they could choose from among "very important (central to who you are)," "important, but not the only thing," "something I don't know a lot about but want to know more about" and "not important" as responses. Moreover, questions on aspects of traditional culture, including use and understanding of a First Nations language, importance of traditional culture, frequency of sharing traditional foods in their household in the past 12 months, use of traditional medicines, participation in traditional ceremonies or help from traditional healers. These questions were derived from the 2008–10 RHS questionnaire for adults. Regarding language, participants were asked which language they used most in daily life, with "English," "French," a "First Nations language" and "other" given as options. Pertaining to traditional Aboriginal health and healing, participants were asked what approaches they currently use, or have used, to manage their health concerns, with "diet," "exercise," "advice from a health professional," "traditional Aboriginal medicines," "traditional Aboriginal ceremonies, help from healer," "no treatment or medicine" and "other" being possible responses. The responses were grouped into "non-traditional approach" and "traditional Aboriginal medicines or ceremonies, help from healer," whereas "no treatment or medicine" was set to missing values for analysis.

Social support. Social support was assessed with four items, each designed to evaluate one of four dimensions of social support—emotional, appraisal, instrumental and informational.[41] Items were prefixed by the words, "There are people in my life who . . ." and the items were ". . . pay attention to my feelings and problems," ". . . appreciate what I do," ". . . I can get help from if I need it" and ". . . I can talk to about how to handle things." Responses were made on a five-point Likert scale of agreement ranging from "strongly disagree" to "strongly agree" with a neutral midpoint. Since each item evaluated a separate dimension, each dimension was individually studied. Summary scores for each dimension comprised the percentage of respondents for whom social support was not readily available, *i.e.*, those who neither agreed nor disagreed, and those who "disagreed" or "strongly disagreed" that there were people in their lives who offered these forms of support, and labelled as "low support" versus "high support" (*i.e.*, those who "agreed" or "strongly agreed").

Psychological stress. The 14-item Perceived Stress Scale evaluates the frequency with which people appraise situations as threatening and their appraised capacity to cope with those situations.[42] Each item is prefixed with the words, "How often during the past year have you felt . . ." followed by a potential stressor. Responses were made on a five-point scale labelled, "never," "hardly ever," "sometimes," "fairly often" and "very often." The six items that evaluated coping were reverse scored in computing an overall summary score, so that a high score indicated high levels of perceived psychological stress. The possible score range is 0 to 56. Due to a skewed distribution, the stress measure was dichotomized at the median and labelled "low stress," reflecting scores of 0 to 26 and "high stress," reflecting scores of 27 or higher.

Substance use and misuse. Data on cigarette smoking and drug and alcohol use were also collected. Smoking was categorized as "never smoked," "used to smoke" and "currently smoke." In addition, mothers were asked if they had used other types of drugs for non-medical reasons, with response options "have never used drugs," "stopped

using drugs" and "yes." If "yes," they were asked to specify the drug(s) they were taking. Mothers were also asked about drinking alcoholic beverages, with four response options "have never drunk alcohol," "used to drink alcohol," "stopped for pregnancy" and "currently drink alcohol." Those who indicated they currently drink alcohol were also asked how often they had five or more alcoholic drinks on one occasion (binge drinking) during the past 12 months. Here, heavy drinking, or frequent binge drinking, was defined as binge drinking once a month or more in the past 12 months.

Ethics. The study protocol was reviewed and approved by the Research Ethics Boards (REBs) at the University of Toronto, the University College of the North, the University of Manitoba, Laurentian University and the University of Winnipeg. At a local level, some communities had various requirements for their community-based research ethics review. On Manitoulin Island, Ontario for example, the project was reviewed and recommended for approval by the Manitoulin Anishinabek Research Review Committee (MARRC), a First Nations community-based REB. In all cases, extensive time was spent with community members to ensure that they understood the research process and their rights and obligations as collaborative partners. Written informed consent was obtained from all participants as well as Aboriginal partner organizations.

Data analysis. To ascertain whether our participants differed from the source population with respect to their personal experience of racism, comparisons were made between our study findings and the results of the 2008–10 RHS. Age-specific estimates of the proportion of Aboriginal people who personally experienced instances of racism in the past 12 months prior to each of the surveys were declared statistically different from one another when the 95% confidence intervals of two point estimates did not overlap. Similarly, statistical differences among the proportions (and means) of pregnant Indigenous women participating in the BTT studies in Canada, Australia and New Zealand who reported racial discrimination in different settings, and overall, were assessed using 95% confidence intervals. As a general guide, non-overlapping 95% confidence intervals are suggestive of $p<.05$. In other words, when confidence intervals do not overlap, we are at least 95% sure that there is a statistically significant difference between the two estimates.

Bivariate associations between covariates and the experience of racism, either in at least one setting or in 4–9 settings ("high racism"), were tested for statistical significance using simple logistic regression. All variables with borderline statistical significance ($p<.06$) were considered as a potential confounding or interacting variable. For the most part, this paper reports only on those covariates that were statistically significant. The magnitude of the risk or the strength of association between each covariate and self-reported racism was expressed as an unadjusted or crude odds ratio and 95% confidence interval. Multivariate binary logistic regression models with oral health measures as the dependent variables, and self-reported racism, as the primary explanatory variable, along with significant covariates, were used to produce covariate-adjusted odds ratios and their accompanying 95% confidence intervals. Two-way interaction terms were allowed to enter the models at $p<.001$. To control for the increased possibility of Type I error due to multiple testing, the alpha level was lowered from 5% to 1%, although Odds Ratios with $.01<p<.05$ are also summarized and discussed. All analyses were conducted using IBM SPSS Statistics V22.0 (IBM Canada Ltd., Markham, ON, Canada).

Results

A total of 544 pregnant Aboriginal mothers were recruited for the BTT Study in Canada, but complete data on self-reported racism were available for 541 (99.4%) participants. The majority was between the ages of 18 and 39 (89.8%). The proportion who reported that they had personally experienced instances of racism in the past 12 months increased significantly with age, peaking after respondents had turned 30 (Table 1). The age-specific prevalence estimates of racism in our study did not differ from those of the broader First Nations population in Canada (Table 1).

International comparisons among BTT participants in the three collaborating countries revealed that race-based discrimination was highest among pregnant Aboriginal Australians (Table 2). Approximately one in three respondents (32.3%) in Canada reported being treated unfairly in the past 12 months because they were First Nations or Métis, as compared with nearly half of Australian Aboriginal and/or Torres Strait Islanders (48.5%) and 45.5% Māori women (Table 2). In Canada, the three settings in which racial discrimination was most commonly reported were public, law (enforcement) and government services. The prevalence of self-reported racism was significantly lower in Canada as compared with Australia in domestic settings, law (enforcement) and in public. The average MIRE score was also lowest among BTT participants in Canada, whereas there were no significant differences in the proportion of pregnant Indigenous women affected by "high" racial discrimination (*i.e.*, racism in 4–9 settings) in the past 12 months in the three nations (Table 2).

Table 3 summarizes the covariates found to be significantly associated with any instances of racial discrimination (*i.e.*, racism experienced in one or more settings) in

Table 1.

PROPORTION OF PREGNANT ABORIGINAL WOMEN REPORTING AN INSTANCE OF RACISM IN THE 12 MONTHS PRIOR TO THE SURVEY COMPARED WITH ADULT PARTICIPANTS IN THE 2008–10 FIRST NATIONS REGIONAL LONGITUDINAL HEALTH SURVEY (RHS)[17]

	"Personally experienced instances of racism in the past 12 months"			
Age (years)	**BTT[a] Canada % (total N)**	**95% CI[b]**	**2008–10 RHS % (total N)**	**95% CI**
14–17	27.1 (48)	(23.3–30.9)	N/A	N/A
18–29	30.6 (369)	(26.7–34.5)	33.4 (2,351)	(30.2–36.6)
30–39	40.9 (115)	(36.7–45.1)	37.4 (1,751)	(34.2–40.6)
40–49	42.9 (7)	(38.7–47.1)	38.1 (1,712)	(34.5–41.7)

[a]BTT = Baby Teeth Talk Study.
[b]CI = Confidence Interval.

Table 2.

RACISM REPORTED BY PREGNANT INDIGENOUS WOMEN PARTICIPATING IN THE BABY TEETH TALK (BTT) STUDY IN CANADA, AUSTRALIA AND NEW ZEALAND

Individual MIRE[a] items: ***"In the past 12 months, have you felt that you have been treated unfairly in any of the following ways because you are First Nations or Métis/Aboriginal/ Māori?"***	**BTT Canada**		**BTT Australia[b]**		**BTT New Zealand**	
	n/N	**% 'Yes' (95% CI)**	**n/N**	**% 'Yes' (95% CI)**	**n/N**	**% 'Yes' (95% CI)**
When applying for work or on the job	51/541	9.4 (6.9–11.9)	55/365	15.1 (11.4–18.8)	30/218	13.5 (9.0–18.0)
At home, by neighbours or at someone else's house	49/541	**9.1** (6.7–11.5)*	73/366	**19.9** (15.8–24.0)*	27/220	12.2 (7.9–16.5)
At school, university, training course or other educational setting	53/541	9.8 (7.3–12.3)	57/365	15.6 (11.9–19.3)	27/221	12.2 (7.9–16.5)
While doing any sporting, recreational or leisure activities	50/541	9.2 (6.8–11.6)	45/365	12.3 (8.9–15.7)	25/218	11.3 (7.1–15.5)
By the police, security people, lawyers or in a court of law	82/541	**15.2** (12.2–18.2)*	83/366	**22.7** (18.4–27.0)*	37/221	16.7 (11.8–21.6)
By doctors, dentists, nurses or other staff at hospitals, dental clinics or doctor's office	53/541	9.8 (7.3–12.3)	40/367	10.9 (7.7–14.1)	22/219	9.9 (5.9–13.9)
By staff of government agencies	78/541	14.4 (11.4–17.4)	52/367	14.2 (10.6–17.8)	47/221	21.2 (15.8–26.6)
When seeking any other services	75/541	13.9 (11.0–16.8)	66/367	18.0 (14.1–21.9)	29/221	13.1 (8.7–17.5)
By members of the general public	121/541	**22.4** (18.9–25.9)*	117/366	**32.0** (27.2–36.8)*	57/218	25.7 (19.9–31.5)
Racism in at least one setting	175/541	**32.3** (28.4–36.2)*	178/367	**48.5** (43.4–53.6)*	101/222	**45.5** (38.9–52.1)*
No perceived racism	366/541	**67.7** (63.8–71.6)*	189/367	**51.5** (46.4–56.6)*	121/222	**54.5** (47.9–61.1)*
Racism in 0–3 settings	462/541	85.4 (82.4–88.4)	297/367	80.9 (76.9–84.9)	187/222	84.2 (79.4–89.0)
Racism in 4–9 settings	79/541	14.6 (11.6–17.6)	70/367	19.1 (15.1–23.1)	35/222	15.8 (11.0–20.6)
Mean total MIRE score (95% CI)	N = 541	**1.1** (1.0–1.3)*	N = 367	**1.6** (1.4–1.8)*	N = 213	1.4 (1.1–1.7)

[a]MIRE: Measure of Indigenous Racism Experiences.[40]
[b]Only those Australians identifying as Aboriginal, Torres Strait Islander or both.
*All p<.05 based on non-overlapping 95% confidence intervals for the comparisons between Canada and Australia/New Zealand. In the comparisons between Australia and New Zealand, "racism in at least one setting" and "no perceived racism" did not differ significantly.

Table 3.

COVARIATES ASSOCIATED WITH THE EXPERIENCE OF RACISM IN AT LEAST ONE SETTING AMONG PREGNANT ABORIGINAL WOMEN PARTICIPATING IN THE BABY TEETH TALK STUDY IN CANADA

Covariates	% (n)	% Reporting racism (n)	Unadjusted OR[a] (95% CI [b])
Age			
14 to 29 years	77.4 (417)	29.7 (124)	1.00
30+ years	22.6 (122)	41.0 (50)	**1.64** (1.08–2.49)*
Education			
Some High School or less	67.2 (361)	29.9 (108)	1.00
High School completed	18.1 (97)	33.0 (32)	1.15 (0.71–1.86)
Some post-secondary education or completed degree	14.7 (79)	44.3 (35)	**1.86** (1.13–3.07)*
Residence			
Reserve	55.8 (302)	28.8 (87)	1.00
City/Town	44.2 (239)	36.8 (88)	**1.44** (1.00–2.07)*
Aboriginal identity and Indian status			
Non-Status First Nations	3.6 (19)	10.5 (2)	1.00
Métis	5.4 (29)	20.7 (6)	2.22 (0.40–12.37)
Status First Nations	91.0 (484)	33.7 (163)	**4.32** (0.99–18.91)*
Importance of culture and ethnicity			
– *Something you don't think about*	10.4 (56)	8.9 (5)	1.00
– *Something you don't know a lot about but want to know more about*	24.1 (130)	24.6 (32)	**3.33** (1.22–9.07)*
– *Important, but not the only thing*	33.2 (179)	33.5 (60)	**5.14** (1.95–13.56)***
– *Very important (central to who you are)*	32.3 (174)	44.3 (77)	**8.10** (3.08–21.27)***
Use of traditional Aboriginal medicine or healer			
No	83.4 (451)	29.9 (135)	1.00
Yes	16.6 (90)	44.4 (40)	**1.87** (1.18–2.97)**
Social Support[c]			
Emotional			
– High	67.4 (364)	28.3 (103)	1.00
– Low	32.6 (176)	40.9 (72)	**1.75** (1.20–2.56)**
Appraisal			
– High	70.9 (383)	29.8 (114)	1.00
– Low	29.1 (157)	38.9 (81)	**1.50** (1.02–2.21)*
Instrumental			
– High	81.9 (442)	30.1 (133)	1.00
– Low	18.1 (98)	42.9 (42)	**1.74** (1.11–2.73)*
Informational			
– High	76.3 (412)	30.8 (127)	1.00
– Low	23.7 (128)	37.5 (48)	1.35 (0.89–2.04)

[a]OR = Odds Ratio.
[b]CI = Confidence Interval.
[c]Social Support Scale.[41]
Simple Logistic Regression: *p≤.05, **p≤.01, ***p≤.001.

the Canadian sample. Racism was more likely to be reported by women aged 30 and older, with more than a High School education, who were Status First Nations and living off reserve, in a large city or small town. English was used most often in daily life by 89.3% of respondents; only 10.4% used a First Nations language daily (data not shown). Culture and ethnicity was "very important (central to who you are)" to approximately one-third (32.3%) of all participants. Compared with those for whom their culture and ethnicity was "something you don't think about," those who valued their culture and Aboriginal identity were more likely to report racism. Similarly, the odds of being discriminated against were higher among those who use, or have used traditional medicine and ceremonies or who had visited a healer in the past to manage their health problems.

Finally, of the psychosocial scales used in this study only social support was related to the experience of "any" racism, meaning racism was more likely to be reported by pregnant Aboriginal women with low levels of emotional, appraisal and instrumental forms of social support in relation to those for whom these forms of support were readily available (Table 3).

Pregnant Aboriginal women reporting "high" racial discrimination (4–9 settings) were also more likely to be older and use traditional Aboriginal medicines or healers (Table 4). Additionally, higher psychological stress levels emerged as a significant covariate at approximately 2-fold increased odds of experiencing high racism as compared with those with lower perceived levels of stress (Table 4).

Additionally, in bivariate analyses, those who rated their general health as "fair" or "poor" had nearly 1.8-times the odds of reporting high racism experience, albeit the result was borderline significant (Table 4). Cigarette smoking was not significantly associated with racism (data not shown). The prevalence of smoking was 55.9% and another 34.2% had quit smoking. Alcohol and drug use were associated with high odds of racial discrimination (Table 4). In particular, pregnant Aboriginal mothers who currently use or have used drugs for non-medicinal reasons were 3.6- and 3.0-times as likely to report racial discrimination in 4–9 settings as those who had never used drugs (Table 4).

Table 5 shows the association between experience of racial discrimination in at least one setting and oral health outcomes. Perceived racism was associated with an approximate 3-fold increased odds of wearing a dental prosthesis (false teeth). This was independent of the effect of age, education, Aboriginal identity and Indian status, residence on- or off-reserve, importance of culture and ethnicity, use of traditional medicines or healers and social support; adjustment for these variables made little difference to the odds ratio. In addition, self-reported racism was associated with receiving dental care off-reserve as compared with on-reserve, and with being asked by a dental care provider to pay for dental services during a visit, in both bivariate and multivariate analyses. It is important to note that Health Canada provides Status First Nations and Inuit coverage for dental services, but that dental procedures require prior approval. Two in three women in our study (66.5%) saw a dental professional in the year prior to the study and 45.0% attended for regular check-ups. Nevertheless, 38.8% perceived their oral health as being "fair" or "poor." Self-rated oral health and access

Table 4.

COVARIATES ASSOCIATED WITH THE EXPERIENCE OF RACISM IN 4–9 SETTINGS (*HIGH* RACISM) AMONG PREGNANT ABORIGINAL WOMEN PARTICIPATING IN THE BABY TEETH TALK STUDY IN CANADA

Covariates	% (n)	% Reporting *high* racism (n)	Unadjusted OR[a] (95% CI[b])
Age			
14 to 29 years	77.4 (417)	12.7 (53)	1.00
30+ years	22.6 (122)	21.3 (26)	**1.86** (1.11–3.13)*
Use of traditional Aboriginal medicine or healer			
No	83.4 (451)	12.6 (57)	1.00
Yes	16.6 (90)	24.4 (22)	**2.24** (1.28–3.90)**
Psychological stress[c]			
Low	52.6 (284)	10.9 (31)	1.00
High	47.4 (256)	18.8 (48)	**1.88** (1.16–3.07)**
Self-rated general health			
Excellent/very good/good	84.4 (455)	13.4 (61)	1.00
Fair/poor	15.6 (84)	21.4 (18)	1.76 (.98–3.17)
Alcohol use			
Have never drunk alcohol	8.5 (46)	4.3 (2)	1.00
Used to drink alcohol	44.3 (239)	13.8 (33)	3.52 (.82–15.24)
Stopped for pregnancy/currently drink alcohol	47.1 (254)	17.3 (44)	**4.61** (1.08–19.73)*
Use of drugs for non-medical reasons			
Have never used drugs	38.1 (202)	6.9 (14)	1.00
Stopped using drugs	53.8 (285)	18.2 (52)	**3.00** (1.61–5.58)***
Current user	8.1 (43)	20.9 (9)	**3.56** (1.43–8.86)**

[a]OR = Odds Ratio.
[b]CI = Confidence Interval.
[c]Perceived Stress Scale with scores dichotomized at the median value = 26.[42]
Simple Logistic Regression: *p≤.05, **p≤.01, ***p≤.001.

to dental care were not significantly associated with self-reported racism (data not shown).

High levels of racism were associated with several oral health outcomes as shown in Table 6. Besides wearing dentures or bridges (false teeth), high racism and having less than 21 teeth were significantly and positively associated and this relationship persisted after adjusting the odds ratio for significant covariates, namely age, use of traditional medicines or healers, psychological stress, self-rated general health, and alcohol and drug use. Interestingly, of the few participants who received orthodontic treatment in the past, none reported any instances of high racism.

The results also suggest that receiving dental care off-reserve, perceiving a need for

Table 5.

SELF-REPORTED ORAL HEALTH OUTCOMES ASSOCIATED WITH THE EXPERIENCE OF RACISM IN AT LEAST ONE SETTING AMONG PREGNANT ABORIGINAL WOMEN PARTICIPATING IN THE BABY TEETH TALK STUDY IN CANADA

Oral Health Outcomes	% (n)	% Reporting racism (n)	Unadjusted OR[a] (95% CI[b])	Adjusted[c] OR (95% CI)
Do you wear *false*[d] teeth?				
No	94.3 (510)	31.0 (158)	1.00	1.00
Yes	5.7 (31)	54.8 (17)	**2.71** (1.30–5.62)**	**2.83** (1.26–6.36)**
Where would you go for dental care?				
On-reserve/in community	28.5 (152)	27.6 (42)	1.00	1.00
Off-reserve/out of community	38.6 (206)	37.4 (77)	**1.56** (0.99–2.46)*	**1.80** (1.10–2.94)*
Both on- and off-reserve/in and out of community	32.8 (175)	30.3 (53)	1.14 (0.70–1.84)	1.09 (0.65–1.82)
Have you ever been asked to pay for dental services during a visit?				
No	88.1 (474)	30.8 (146)	1.00	1.00
Yes	11.9 (64)	45.3 (29)	**1.86** (1.10–3.16)*	**2.46** (1.31–4.62)**

[b]CI = Confidence Interval.
[a]OR = Odds Ratio.
[c]Odds ratios adjusted for the covariates listed in Table 3.
[d]False teeth = full or partial dentures or dental bridges.
Simple and Multiple Logistic Regression, where applicable: *p<.05, **p≤.01.

Table 6.

SELF-REPORTED ORAL HEALTH OUTCOMES ASSOCIATED WITH THE EXPERIENCE OF *HIGH* RACISM AMONG PREGNANT ABORIGINAL WOMEN PARTICIPATING IN THE BABY TEETH TALK STUDY IN CANADA

Oral health outcomes	% (n)	% Reporting *high* racism[a] (n)	Unadjusted OR[b] (95% CI[c])	Adjusted[d] OR (95% CI)
Do you wear *false*[e] teeth?				
No	94.3 (510)	13.5 (69)	1.00	1.00
Yes	5.7 (31)	32.3 (10)	**3.04** (1.38–6.74)**	**3.29** (1.39–7.78)**
Are you fearful of going to the dentist?				
No/little bit	83.5 (452)	13.3 (60)	1.00	1.00
Fair bit/very much	16.5 (89)	21.3 (19)	**1.77** (1.00–3.15)*	1.61 (0.87–2.97)
Where would you go for dental care?				
On-reserve/in community	28.5 (152)	8.6 (13)	1.00	1.00
Off-reserve/out of community	38.6 (206)	14.6 (30)	1.82 (0.92–3.63)	1.83 (0.88–3.80)
Both on- and off-reserve/in and out of community	32.8 (175)	19.4 (34)	**2.58** (1.31–5.09)**	**2.53** (1.23–5.20)**
Perceived need for preventive dental care				
No	41.1 (147)	8.8 (13)	1.00	1.00
Yes	58.9 (211)	19.0 (40)	**2.41** (1.24–4.69)**	**2.19** (1.08–4.42)*
Flossing				
Never/less than twice per day	94.2 (508)	13.8 (70)	1.00	1.00
Two or more times per day	5.8 (31)	29.0 (9)	**2.56** (1.13–5.79)*	**3.04** (1.28–7.23)**
Oral Health Impact on Quality of Life[f]				
Low/moderate	84.8 (459)	13.3 (61)	1.00	1.00
High	15.2 (82)	22.0 (18)	**1.84** (1.02–3.31)*	1.65 (0.89–3.08)
Number of teeth (dentate only)				
21 teeth or more	90.7 (312)	11.5 (36)	1.00	1.00
20 teeth or less	9.3 (32)	31.3 (10)	**3.49** (1.53–7.95)**	**3.09** (1.30–7.35)**
Have received orthodontic treatment (dentate only)				
Yes	10.5 (30)	0.0 (0)	1.00	Could not be computed
No	89.5 (256)	14.5 (37)	**1.17** (1.11–1.23)*	

[a]High racism = racism in 4–9 settings.
[b]OR = Odds Ratio.
[c]CI = Confidence Interval.
[d]Odds ratios adjusted for the covariates listed in Table 4.
[e]False teeth = full or partial dentures or dental bridges.
[f]Scale with 7 frequency-response items (4 items concerned with oral symptoms and 3 items concerned with psychological discomfort, functional limitation, and social disability in the last year). Item scores were summed for each respondent and the distribution of total scale scores for the study sample was dichotomized at the 15th percentile as per sensitivity analysis.[39]
Simple and Multiple Logistic Regression, where applicable: *p<.05, **p≤.01.

preventive dental care, and flossing teeth two or more times per day were oral health outcomes associated with reporting racism experiences in 4–9 settings, independent of adjusting for significant covariates (Table 6). Covariate adjustment, however, rendered the odds ratios for dental fear and oral health impact on quality of life as non-significant (Table 6).

Discussion

Racism: National and international comparisons. Racism has an impact on the physical, mental, emotional and spiritual aspects of personal wellness of First Nations adults. In the 2008–10 RHS approximately one out of three respondents experienced instances of racism in the 12 months prior to the survey; however, rates of perceived racism were age-dependent and were lowest among those aged 50 years and older.[17] Age-specific comparisons between the proportion of respondents reporting instances of interpersonal racism in the current study population and the on-reserve First Nations population participating in the 2008–10 RHS revealed no major differences. It should be noted that the oldest respondent in the current study was aged 49 years.

Nearly one-third of all pregnant First Nations and Métis women in the present study reported past-year exposure to racism across a variety of settings, with public, law (enforcement), and government services identified as especially salient. Although this is a large proportion of women, the prevalence experiencing racism was significantly lower when compared with prevalence estimates among BTT Study participants in Australia and New Zealand. Psychological distress may partly explain some of the differences between the three study populations. According to the 2008–10 RHS, psychological distress was more likely to be experienced by adults who reported exposure to racism in the year prior to the survey.[17] Indigenous populations worldwide are exposed to a host of ongoing stressors in adulthood, including poverty and unemployment, injury and violence, racial discrimination and stigmatization to name a few. This constellation of stressors can put a strain on, and exceed an individual's coping resources, creating psychological distress. Very high levels of psychological distress have been observed among Indigenous Australian adults. These adults were approximately three times more likely than non-Indigenous Australians to be classified with "very high psychological distress" in two nationally representative surveys.[43] Such disparities in distress levels also are present in New Zealand. For example, Māori who were socially-assigned as any Māori or non-European ethnic group had significantly higher psychological distress scores compared with Māori who were socially-assigned as European-only.[26] This appeared to operate via socioeconomic advantage and lower experience of racial discrimination among those Māori socially-assigned as European-only. Given the high distress levels observed among Indigenous peoples in Australia and New Zealand, it is possible that the prevalence and distribution of stressors differ between the Indigenous populations of these countries and their counterparts in Canada. Of course, this and other possible explanations should be explored further.

Correlates of racism. Several socio-demographic, cultural and psychosocial factors, as well as risk behaviors, were significantly associated with self-reported racism in this study. Canadian Aboriginal women between the ages of 30 and 49 years were signifi-

cantly more likely to perceive racial discrimination than younger women. It has been suggested that this is the time of life when expectations of fair treatment are greatest and instances of racial discrimination are more likely to be recognized.[27] Women living in cities or towns encountered higher levels of racism than those living on reserves. This finding is to be expected because of the increased contact with non-Aboriginal people in urban communities. Educated Aboriginal women were also more likely to report experiencing racism, a finding consistent with the 2002–03 RHS[18] and possibly indicative of more exposure to inter-racial discrimination in the work place or because these women defy stereotypical views of Aboriginal people as uneducated.[27] In contrast to education, employment, income, and housing were not significantly associated with the reporting of racism. In the case of employment, this may have resulted at least in part from the relatively low proportion of pregnant Aboriginal women who were working either full-time or part-time (18.4%). More than half were on some form of social assistance and nearly a third lived in overcrowded housing (data not shown).

First Nations identity and status were related to increased reporting of racism. In addition, attitudes reported by study participants on the importance of traditional culture and ethnicity had statistically significant association with personal experiences of racism. It was encouraging to discover that the majority of the participants valued their culture. Interestingly, those who had experienced an incident of racism were eight times more likely to deem traditional culture as "very important" as compared with those who "don't think about their culture and ethnicity." The greater one's own sense of Aboriginal identity and participation in traditional cultural events (e.g., powwows, sweat lodges, community feasts), the more likely they were to experience racism. Both this heightened sense of indigeneity and participation in traditional activities provide a cogent explanation for the increased likelihood of experiencing discrimination. Aboriginal Canadians who make a concerted effort to engage in the practices and traditions of their culture are more likely to be targets of racial discrimination because they serve as visible representatives of that culture.

Higher reporting of racism was also associated with visiting a traditional healer or using traditional Aboriginal medicine for managing health concerns. This finding is indirectly related to results of the 2002–03 RHS which indicated that First Nations adults who feel in balance with the four aspects of their lives (spiritual, emotional, mental and physical well-being) seek personal and emotional support from traditional healers or family members, while those who are feeling sad, blue or depressed are more likely to report using mainstream mental health and emotional support almost exclusively.[18] The decision to visit a traditional Aboriginal healer and/or use traditional medicines may be indicative of a desire for respectful treatment and/or preference to engage in a healing relationship with an Aboriginal provider. In contrast, research has shown that Indigenous peoples around the world often have negative experiences within mainstream health care settings, where instances of racism are commonly reported.[44,45] This structural or institutional racism can be expressed through longer wait times, fewer referrals, and disrespectful treatment by health care professionals and staff.[15,46,47] Taken together these experiences with racism in health care settings result in some Aboriginals turning (or returning) to traditional healers and traditional medicine for help and support.

Consistent with previous research among First Nations, those with lower levels of

social support were more likely to perceive racial discrimination.[17] Social support is thought to buffer the pernicious health effects of racism and the psychological stress it evokes. In other words, life stressors such as racism may activate social support and, in turn, social support may buffer stressors. Emotional, appraisal and instrumental support were three out of the four dimensions of social support that were less available to pregnant Aboriginal women with experiences of racism in our study. Emotional support provides love, caring, sympathy and understanding and appraisal support offers help in decision making and giving appropriate feedback. Instrumental and informational support offer concrete practical aid and may be more readily available to women who themselves have stocks of these resources.[41]

The study used different thresholds for racism exposure, *i.e.*, racism in at least one setting (1–9 settings) and high racism (4–9 settings). High racism was more uncommon at 14.6% but comparable to the estimates from Australia and New Zealand (Table 2). Not surprisingly, high psychological stress levels and high racism exposure were linked. The study also found evidence for linkages between high racism exposure, illicit drug use, and alcohol consumption. These findings provoke serious concern and stem not only from the stress of living in a racially charged environment, but also from the marginalization, intergenerational trauma, poverty, and cultural deterioration experienced by many of the Aboriginal mothers in this study.

Racism and oral health outcomes. Where oral health is concerned, perceived psychological stress partly mediated the relationship between self-reported racism and tooth brushing behavior among pregnant Aboriginal women in South Australia participating in the BTT Study.[30] This finding indicates that stress is a strong factor influencing the causal pathways between oral health outcomes and racism. Stress during pregnancy can be substantial and can have an effect on self-care behaviors. Although our data did not find a significant relationship between racism exposure and tooth brushing behavior, high levels of racism were significantly associated with the frequency of flossing and the mothers' perceived need for preventive dental care, such as professional application of fluoride varnish and dental cleanings. Interestingly, women who flossed their teeth two or more times per day were more likely to report high levels of racism relative to those who flossed their teeth less often. The "high flossers" also tended to be those who had attained higher levels of education (data not shown). Education is known to have a significant effect on preventive health behaviors and as we have already noted in this paper, it is also linked to higher rates of self-reported racism. Pregnancy also causes hormonal changes that increase the mother's risk for developing oral health problems like gingivitis and periodontitis. As a result of varying hormone levels, some women will develop gingivitis sometime during their pregnancy—a condition called pregnancy gingivitis. In connection to pregnancy gingivitis, 59% of the pregnant women in our study perceived a need for preventive dental care and they were approximately two times more likely to have experienced racism in four to nine settings in the past year than those who had no perceived need for preventive dental care.

Our study found that high levels of self-reported racism were associated (at the bivariate analysis level only) with high scores on an abbreviated oral health-related quality of life scale comprised of items related to complaints of oral symptoms such as toothache, bleeding gums, chronic dry mouth and chronic bad breath, and discomfort

with the appearance of teeth or dentures, problem eating some foods, and missing work or school because of dental problems. Supporting this finding, a recent publication reported that past year-exposure to racism was a risk indicator for experience of toothache among the sample of pregnant Aboriginal women taking part in the BTT Study in Australia.[31] Toothache or dental pain is a key component of oral health-related quality of life. In Canada, First Nations and Inuit lag behind on almost every aspect of oral health relative to non-Aboriginal Canadians; they have worse perceptions of their oral health and more untreated oral disease, worse oral health-related quality of life, and lower attendance for regular check-ups.[48–50]

In this study, and in the three most recent Canadian oral health surveys, visiting a dental professional within the last year was used as an indicator of access to dental care.[48–50] Two in three women in our study saw a dental professional in the year prior to the study. Access to dental services was not found to be associated with past year-exposure to racism. That said, visiting a dental health professional at least once in the previous 12 months is far from a precise measure of the quantity or pattern of care, as one visit for an extraction counts the same as several visits for extensive treatment or preventive care. However, visiting a dentist in the past year is easily recalled by respondents and is commonly reported in national surveys. The current data *do* suggest that women reporting they had experienced racism found challenges to utilizing dental services, and they consistently encountered more obstacles to access than those who did not experience racism. Specifically, pregnant Aboriginal women in this study who experienced an incident of racism in the past year were significantly more likely to report being asked by a dental care provider to pay for dental services during a visit. Paying for services during a visit to a dentist is not normally required if services are covered under the Non-insured Health Benefits (NIHB) Program of Health Canada. The NIHB is Health Canada's national health benefit program that provides coverage for 90% of the costs of dental claims for all registered First Nations people and Inuit, provided prior approval or predetermination is obtained. In addition, those reporting high levels of racism were more likely to feel scared about going to the dentist and to not have received orthodontic treatment in the past. The examiners found that 10.5% of pregnant Aboriginal women had received orthodontic treatment prior to the study, but none of them reported any instances of racism.

Dental care, in general, was more often obtained off-reserve rather than on-reserve. At the same time, racism exposure was more often reported among those who went off-reserve for dental care. However, exposure to racism was greatest when dental care was sought on- and off-reserve. This is possibly related to Aboriginal peoples' negative experiences within health care settings, a finding that warrants further consideration. According to results from the 2002–03 RHS, First Nations adults who indicated that they had experienced racism were more likely to report virtually all barriers to health care access, including "difficulty getting traditional care," "services not covered by Non-insured Health Benefits," "approval for services under NIHB was denied," "felt health care provided was inadequate" and "felt service was not culturally appropriate."[18]

Racial discrimination may also explain some of the racial disparities that exist between the oral health status of Aboriginal Canadians and that of the broader Canadian population. The examiners in this study found that 5.7% of pregnant Aboriginal women

wore a full denture on one or both arches and that 9.3% had an inadequate dentition, *i.e.*, fewer than 21 natural teeth. While these figures are troubling enough, given the young ages of most of the participants, wearing dentures was significantly associated with both low and high levels of racism exposure, whereas a shortened dental arch with fewer than 21 natural teeth was significantly associated with high racism exposure. The role of racism in tooth loss has recently been investigated in a Brazilian civil servant population of Blacks, Browns and Whites.[51] In this Brazilian study, discrimination due to social class/socioeconomic position or race did not mediate the relation between race and self-reported tooth loss. Age, sex and socioeconomic variables explained most of the racial inequalities in tooth loss, while oral health-related behavioral factors (routine dental care) and self-reported discrimination variables contributed very little.[51] The authors drew upon previous work to claim that tooth loss may be influenced by experiences of discrimination via prejudicial attitudes and discriminatory behavior held by dental professionals. In another study, the dentist's decision on whether to extract or to retain a decayed tooth varied significantly according to the patient's race, with dentists deciding to extract the teeth of Black patients more frequently than Whites.[52] In contradistinction, in a study in Florida among Whites, Blacks and Hispanics, perceived discrimination was not associated with self-reported oral health.[53]

Strengths and limitations. Some strengths and limitations of the study must be pointed out. One of the main strengths was that the study explored the potential insidious effects of racism on a selected set of oral health outcomes. Oral health outcomes included oral health status indicators, dental care access and utilization, oral health care practices, dental perceptions and the impact of oral health conditions on quality of life. Most measures, though, were self-reported and therefore subject to respondents' recall bias. Furthermore, the fact that the same methodology was used in the three collaborating countries where the BTT Study is being carried out enabled the direct comparison of MIRE individual self-reports of interpersonal racism across the three nations. However, an obvious limitation of the study is that racial discrimination is difficult to accurately measure as it relies on an individual's perception of the purported racist event, whether the incident was actually discriminatory or not. It is also possible that survey respondents are more likely to under-report unpleasant personal experiences such as racism, rather than over-report them. Moreover, while racism occurs on multiple socioecological levels, the MIRE scale focused on instances of racism experienced interpersonally, which is not an institutional/structural form of racism. Therefore the study only captures racism exposures that individuals actually perceive; it does not capture any racism exposures occurring at higher socioecological levels. As such, these are likely conservative estimates of the extent of racism by pregnant Aboriginal Canadians, but they are on a par with national estimates of First Nations peoples' experience of racism reported elsewhere.[17]

It must also be mentioned that due to the use of cross-sectional data derived from the baseline interviewed-questionnaires with the prenatal women participating in the BTT Study, the directionality of the associations between racism and oral health outcomes cannot be determined. Although evidence from longitudinal studies indicates that racism is a risk factor for poor health, the converse, though unlikely, cannot be ruled out in this study.

Finally, the vast majority of participants self-identified as First Nations and they are broadly representative of First Nations women of the same age living in urban and on-reserve communities in Canada; they share the same levels of education, housing and employment rates.[48,50] Participants in this study also experienced the same levels of self-rated oral health status and access to care, as reported in the 2009–10 First Nations Oral Health Survey.[50]

Summary and Conclusions

In keeping with the holistic notion of First Nations balance in their physical, emotional, mental, and spiritual lives and the interrelatedness of these aspects of overall wellbeing, this study found that experiences of racism also had significant links to oral health outcomes. Approximately one in three pregnant Aboriginal women in our study reported experiencing racism in the past year. The prevalence of reports of racial discrimination was as common as that found in a nationally representative sample of Canadian First Nations. While it is disconcerting that racial discrimination was so common among this sample and nationally in Canada, it is worth noting that the prevalence of self-reported racism was less than the estimates found among pregnant Indigenous peoples in Australia and New Zealand. Public places and law enforcement were the most common settings in which racism was experienced both in this sample and in the Australian sample. Covariates significantly associated with the experience of racism, whether in one or more settings, included participants aged 30 years and older, those with secondary education, living off-reserve, with Indian status and a heightened sense of Aboriginal identity, who valued their culture and ethnicity, used traditional medicines or healers, and had a low level of social support. Covariates associated with *high* levels of self-reported racism, *i.e.*, racism in 4–9 settings, included participants aged 30 years and older, who used traditional medicines or healers, had high levels of psychological stress, and used drugs and alcohol. When the effects of covariates were controlled for using multivariate binary logistic regression, the oral health outcomes that emerged as significantly associated with the reporting of incidents of racial discrimination included wearing dentures, going for dental care off-reserve and having been asked to pay for dental services during a visit. The oral health outcomes that were consistently associated with *higher* reporting of racial discrimination in both bivariate and multivariate analyses included wearing dentures, going for dental care both on- and off-reserve, perceiving a need for preventive dental care, flossing teeth twice daily or more, and having less than 20 natural teeth. Those reporting high racism were also more likely to report barriers to accessing dental services, notably receiving orthodontic treatment, in addition to fears of going to the dentist and a high perceived impact of oral conditions on their quality of life. These relationships, while not necessarily causal, offer valuable insight into some of the kinds of racial discrimination experienced by Aboriginal women in the context of dental care in contemporary Canada. Of course, further research is needed to assess the mechanisms by which racism influences the oral health of Aboriginal Canadians so as to develop effective interventions and treatment strategies aimed at alleviating the burden of oral disease in this population. At the same time, our gaze needs to be turned toward the promotion of effective policies,

programs and strategies that address racism as experienced by Indigenous peoples in Canada and elsewhere in order to undo the damage and lingering effects of colonization. Lastly, given that this study focused on pregnant Aboriginal women, many of whom were particularly vulnerable to the harmful effects of racism, research and subsequent programs and policies should consider not only the mothers, but also racism's insidious impact on their children's oral health outcomes.

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