

Racial discrimination, post-traumatic stress and prescription drug problems among Aboriginal Canadians

Cheryl Currie, PhD,¹ T. Cameron Wild, PhD,² Donald Schopflocher, PhD,² Lory Laing, PhD²

ABSTRACT

OBJECTIVES: 1) To examine associations between racial discrimination and drug problems among urban-based Aboriginal adults; and 2) to determine whether these associations are best explained by symptoms of psychological stress, distress or post-traumatic stress disorder (PTSD).

METHODS: Data were collected through in-person surveys with a community-based sample of Aboriginal adults ($N = 372$) living in a mid-sized city in western Canada in 2010. Associations were examined using bootstrapped linear regression models adjusted for confounders, with continuous prescription and illicit drug problem scores as outcomes. Mediation was examined using the cross-products of coefficients method.

RESULTS: More than 80% of Aboriginal adults had experienced racial discrimination in the past year, with the majority reporting high levels in that period. Past-year discrimination was a risk factor for PTSD symptoms and prescription drug problems in models adjusted for confounders and other forms of psychological trauma. In mediation models, PTSD symptoms explained the association between discrimination and prescription drug problems; psychological stress and distress did not. PTSD symptoms also explained this association when the covariance between mediators was controlled. The results also indicate that participation in Aboriginal cultural traditions was associated with increased discrimination.

CONCLUSIONS: Most efforts to address Aboriginal health inequities in Canada have focused on the role Aboriginal people play in these disparities. The current findings combine with others to call for an expanded focus. Non-Aboriginal Canadians may also play a role in the health inequities observed. The findings of this study suggest efforts to reduce discrimination experienced by Aboriginal adults in cities may reduce PTSD symptomology and prescription drug problems in these populations.

Key words: Aboriginal; racial discrimination; prescription drugs; posttraumatic stress; Canada

La traduction du résumé se trouve à la fin de l'article.

Can J Public Health 2015;106(6):e382–e387
doi: 10.17269/CJPH.106.4979

Aboriginal peoples experience a disproportionate burden of drug problems with serious implications for health.^{1,2} To date, we do not have a common understanding of the determinants underlying these disparities. Research suggests that a social determinant of particular relevance for health disparities is racial discrimination.^{3–7} In Canada, racism and its impacts on Aboriginal health have received little attention in the scientific literature. Racism is an ideology that ranks some groups as inferior on the basis of their ethnicity or phenotypic characteristics.⁸ Racism informs action by justifying the prejudicial attitudes and unfair treatment (discrimination) of individuals and institutions against visible minorities.⁸ Targets are aware of some of the discriminatory behaviour directed at them, which often generates significant levels of stress.⁹

A number of conceptual models have been used to describe the impacts of discrimination on health. A prevailing paradigm is the stress and coping framework. This model focuses on the psychological stress associated with discrimination and the use of coping strategies to control these reactions.¹⁰ Currently, the boundaries of the framework are being pushed by an expanding body of evidence suggesting that individuals may have visceral reactions to discrimination that extend beyond their psychological control. More than a dozen experimental studies now document that discrimination causes visceral physiologic stress responses across racial groups.³ Discrimination has been

associated not only with poor mental health but also stress-induced endocrine dysfunction, cardiovascular dysfunction, shortened telomere length, and other markers of accelerated aging.¹¹ Discrimination may also reduce an individual's self-control resources, resulting in less energy to elicit effective coping strategies and behavioural choices.³ Pertinent to this study, longitudinal research has shown that discrimination results in prospective increases in substance use over time.⁷ Although the mechanisms through which discrimination impacts substance use likely extend beyond psychological stress or distress, explanations are often limited to these emotions. A few studies have considered the impacts of discrimination on the development of post-traumatic stress disorder (PTSD).^{11–15} For example, a recent study found PTSD symptoms can explain associations between discrimination and health behaviour, including substance use.⁵ Yet research to date has not examined

Author Affiliations

1. Faculty of Health Sciences, University of Lethbridge, Lethbridge, AB
2. School of Public Health, University of Alberta, Edmonton, AB

Correspondence: Cheryl Currie, PhD, Faculty of Health Sciences, University of Lethbridge - M3083 Markin Hall, 4401 University Drive, Lethbridge, AB T1K 3M4, Tel: 403-332-4060, E-mail: cheryl.currie@uleth.ca

Funding sources: This study was funded by the Alberta Gambling Research Institute and the Alberta Centre for Child, Family & Community Research (ACCFRC). C. Currie was salary-supported by awards from Alberta Innovates: Health Solutions and ACCFCR during the course of this research.

Conflict of Interest: None to declare.

whether associations between discrimination and substance use are best explained by symptoms of psychological stress, distress or PTSD. The objectives of the current study were to 1) examine associations between racial discrimination and drug problems among urban-based Aboriginal Canadians, and 2) determine whether these associations were best explained by symptoms of psychological stress, distress or PTSD.

METHODS

We organized and worked collaboratively with an Aboriginal Advisory Committee comprising key stakeholders within the Edmonton Aboriginal community. Together we set study priorities, selected measures and decided how data would be collected. After a pilot study, it was determined that an in-person survey would be administered to a community-based sample of adults who self-identified as Aboriginal in Edmonton. Random sampling was cost-prohibitive given Aboriginal adults make up less than 5% of the population in this city. Instead, participants were recruited using posters placed in public spaces (e.g., stores, malls, coffee shops) and organizations offering social, educational, employment and housing opportunities. Advertisements were also placed in community newspapers and e-newsletters. The range and breadth of advertisement locations were carefully considered, taking into consideration the socio-demographic profile and geographic distribution of Aboriginal peoples in Edmonton. To increase generalizability, snowball sampling was avoided. No advertising took place in drinking establishments or treatment centres. Recruitment adverts asked whether individuals were interested in taking part in an Aboriginal health study and provided contact information to set up a one-on-one appointment with a research assistant.

Data were collected from May to December 2010. Written consent was obtained from all participants. The study protocol was approved by the Human Research Ethics Board at the University of Alberta. Each participant completed a questionnaire package by hand (mean completion time = 70 minutes). Participants were asked whether they would like the questionnaire read to them; all declined. An assistant remained in the room at all times working at another desk to answer questions during survey completion. Each participant was given an honorarium of \$25 for his or her time.

Outcome variables

Drug problems were assessed using two applications of the Drug Use Disorders Identification Test (DUDIT), an 11-item psychometrically validated screening tool for drug problems.¹⁶ Scores range from 0 to 44. Validation research suggests that scores 2 standard deviations above the mean may indicate a drug problem, which has translated to ≥ 6 for men and ≥ 2 for general populations. The DUDIT has sensitivity and specificity scores of 0.90 and 0.85 respectively when a cut-off of ≥ 8 is used in a clinical sample.^{16,17} To assess prescription drug problems, the first question was modified from “How often do you use drugs other than alcohol” to “How often do you use prescription pain killers, sedatives, tranquilizers or stimulants?” Remaining items were modified by including “prescription” before “drug” (e.g., how often over the past year have you taken prescription drugs and then neglected to do something you should have

done?). To differentiate the second screen for illicit drugs, question 1 was modified to “How often do you use illegal drugs?” Subsequent questions were modified by including “illegal” in front of “drug” for each question. In the current study, the internal consistency of the DUDIT was excellent ($\alpha = 0.91$ and 0.92 for prescription and illicit drug versions of the measure respectively).

Exposure variable

The Experiences of Discrimination (EOD) Scale is a valid and reliable measure of self-reported racial discrimination that has been used across many ethnic groups.¹⁸ The situation score is derived by counting the number of situations (0 to 9) in which racial discrimination has been experienced. Previous research suggests that Aboriginal Canadians experience high levels of racism; thus the scale was adjusted to measure experiences in the past 12 months to achieve sufficient variability.¹⁹ Each question was worded as follows, with information in brackets reflecting words added and X reflecting the situation tested: (*In the past 12 months*) have you experienced discrimination, been prevented from doing something, or been hassled or made to feel inferior at X because of your (Aboriginal) race, ethnicity or colour? Internal consistency of the measure in this study was good ($\alpha = 0.82$). Additional EOD questions examined discrimination experienced in childhood.¹⁸

Mediators

PTSD

The PTSD Checklist (PCL)-Civilian Version assessed PTSD symptoms.²⁰ The measure assesses 17 symptoms occurring in the past month, ranging from 1 (not at all) to 5 (extremely). Items were summed to obtain a total score (range = 17 to 85). A meta-analysis of the PCL concluded that it is a well-validated measure with good temporal stability, internal consistency, test-retest reliability, and convergent validity across ethnically diverse populations.²¹ In the current study, internal consistency was excellent ($\alpha = 0.95$).

Psychological Stress

The 10-item Perceived Stress and Coping Scale is one of the most widely used measures of psychological stress. Items assess the extent to which individuals have experienced symptoms of stress in the past month using a 5-point scale from “never” to “often”.²² Scores range from 0 to 40. In the current study, the internal consistency was good ($\alpha = 0.85$).

Psychological Distress

The 12-item General Health Questionnaire is a widely used psychological distress screen. Items assess the severity of general psychological distress in the past few weeks using a 4-point scale from “much less than usual” to “more than usual”. Scores range from 0 to 36.²³ In the current study, internal consistency was good ($\alpha = 0.82$).

Covariates

Gender, age, marital status, education, employment and household income were assessed. Consistent with previous studies, a large percentage of Aboriginal adults left income blank

(40.4%).¹⁹ As this was anticipated, participants were also asked if they had experienced poverty in their lifetime (never, as a child only, as an adult only, all my life). Few (2%) left this question blank. This variable was used to adjust for poverty across the life course. To control for other forms of trauma shown to influence PTSD and substance abuse, participants were asked whether they had been separated from their parents in childhood (yes or no) and whether they had experienced physical or sexual abuse in childhood (yes or no).²⁴ Enculturation and acculturation were measured using the Vancouver Index²⁵ and were controlled for in models given that each has been associated with discrimination and substance use.^{19,26,27}

Analysis strategy

Associations between discrimination and drug problems were examined using bootstrapped linear regression models and 95% confidence intervals (CIs) ($k = 5000$).²⁸ All variables were analyzed in continuous form and adjusted for confounders selected *a priori* using existing literature (age, gender, education, marital status, unemployment status, life course poverty, childhood trauma). Statistical interactions were examined using Loess curves and hierarchical *F* tests;²⁹ none were found. Mediation was examined using a multivariate approach to the cross-products of coefficients method developed by Preacher and Hayes.²⁸ A total of 5,000 random samples of the original size were taken from the data with replacement, and the indirect effect ($a*b$) was computed for each sample (Figure 1). The point estimate of the indirect effect was the mean $a*b$ value computed over the samples, with 95% CIs derived from the obtained distribution of $a*b$ scores.²⁴ If the upper and lower bounds of these bias-corrected CIs did not contain zero, the indirect effect was significant. Only values that reached conventional levels of significance ($p \leq 0.05$) were interpreted.

RESULTS

The mean age of participants was 35.2 years (SD = 11.5, range = 18 to 79 years). The sample included approximately 20% more women than men, which is consistent with the gender distribution of Aboriginal adults in Edmonton (Table 1).³⁰ Reported household income and educational attainment also matched population-based estimates. There were more unmarried and unemployed participants than would be expected if random sampling had been used.³⁰ About a quarter of the sample had never lived in poverty, while 30% had lived in poverty all their lives. On average, participants had lived in Edmonton for 15 years (SD = 12.3, range 0.8 to 60 years).

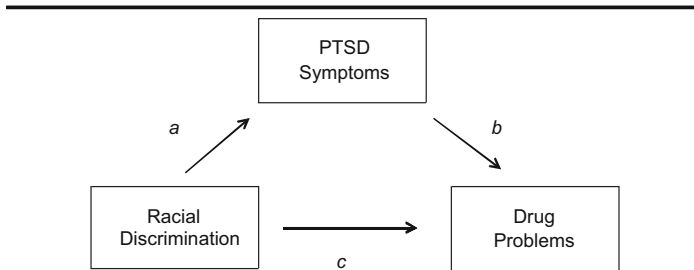


Figure 1. Hypothesized mediational pathway

Table 1. Demographic characteristics of sample

Characteristic	Sample N (%)
Total sample	372 (100)
Aboriginal group	
First Nation/Aboriginal	275 (76.6)
Métis/mixed ancestry	81 (22.6)
Inuit	3 (0.3)
Gender	
Male	150 (41.4)
Female	212 (58.6)
Age quartiles (years)	
18–24	83 (23.3)
25–34	92 (25.8)
35–44	97 (27.2)
≥45	84 (23.6)
Marital status	
Never married	156 (43.2)
Married/cohabiting	139 (41.3)
Not currently married	56 (15.5)
Education	
<High school diploma	159 (45.2)
High school diploma	39 (11.1)
Some university/college	85 (24.1)
University/college degree	69 (19.6)
Employment	
Employed full/part-time	96 (26.7)
Unemployed	159 (44.2)
Student	86 (23.9)
Retired or homemaker	19 (5.3)
Household income	
<\$10,000	54 (24.4)
\$10,000–\$19,999	48 (21.7)
\$20,000–\$39,999	57 (25.3)
\$40,000–\$59,999	24 (10.9)
≥\$60,000	39 (10.5)
Question not answered	150 (40.4)
Lived in poverty	
Never	92 (26.0)
As a child	97 (27.4)
As adult	60 (16.9)
All my life	105 (29.7)

Racial discrimination

Approximately 8 in 10 participants had experienced discrimination due to Aboriginal race in the past year, most frequently in public spaces, stores and restaurants, and at work. Krieger and colleagues define high and moderate discrimination by situation scores of 3 to 9 and 1 to 2 respectively.³¹ Using these criteria, 51.3% of Aboriginal adults experienced high and 29.8% moderate levels of discrimination in the past year ($M = 3.3$ situations, $SD = 2.7$, range = 0–9). Levels of discrimination in the past year were positively correlated with levels experienced in childhood ($r = 0.49$, $p < 0.001$), highlighting the importance of viewing discrimination as a life course variable. The extent to which participants were engaged in Aboriginal culture was associated with more frequent discrimination in the past year (partial $r = 0.15$, $p = 0.008$ adjusting for age, gender, education, unemployment, marital status and poverty).

Discrimination and drug problems

The mean prescription drug problem score (4.63, $SD = 8.53$, range = 0 to 44) was lower than the mean illicit drug problem score (8.45, $SD = 11.02$, range = 0 to 44). Racial discrimination was significantly and positively associated with illicit drug problems in an unadjusted model ($B = 0.59$, 95% CI 0.12–1.10). After adjustment for covariates this association was no longer significant ($B = 0.18$, 95% CI 0.32–0.66). Unemployment, life course poverty and separation from parents in childhood were

Table 2. Bootstrapped point estimates and bias-corrected 95% confidence intervals (CIs) for the direct effects of racial discrimination on prescription drug problem score*

	Model 1			Model 2 Adjusted R ² =0.17		
	B (95% CI)	Standard error	β	B (95% CI)	Standard error	β
Racism score	0.74 (0.35, 1.15)	0.21	0.23	0.51 (0.11, 0.93)	0.20	0.17
Age				0.06 (-0.02, 0.15)	0.04	0.08
Gender				-0.38 (-1.52, 2.27)	0.94	-0.02
Education				-1.36 (-2.08, -0.71)	0.36	-0.20
Unemployed				2.62 (0.68, 4.43)	0.97	0.16
Divorced/separated				-0.70 (-3.20, 1.90)	1.30	-0.03
Life course poverty				1.01 (0.128, 1.85)	0.40	0.13
Parental separation				1.45 (-0.42, 3.33)	0.95	0.09
Abuse as child				-0.86 (-2.83, 1.16)	0.97	-0.05
Enculturation				-0.78 (-1.70, -0.07)	0.41	-0.13
Acculturation				0.90 (0.21, 1.63)	0.35	0.13

* Significant results are provided in bold. Model 1 provides an unadjusted estimate of the main exposure. Model 2 is adjusted for covariates.

the strongest correlates of illicit drug problems in this study. Racial discrimination was significantly and positively associated with prescription drug problems in unadjusted and adjusted models (Table 2).

Post-traumatic Stress as a Mediator

Post-traumatic stress scores ranged from 17 to 85 (M = 40.0, SD = 15.9). Mediators of the association between discrimination and illicit drug score were not tested given that the c pathway was not significant. A mediational analysis of the association between discrimination and prescription drug score began with a test of pathway a (Figure 1). Using the Preacher and Hayes method, the association between past-year discrimination (exposure) and PTSD symptomology (outcome) was tested in a bootstrapped, fully adjusted model. As shown in Figure 2, PTSD score increased by 1.22 points for each additional situation in which racism was experienced over the past year. PTSD symptomology was also significantly associated with prescription drug problems (i.e., pathway b).

Next, the indirect ab pathway was computed across 5,000 random samples of the original size with replacement. The indirect effect (ab) was automatically computed for each sample. The mean ab value (point estimate) obtained from the bootstrapped distribution of ab scores was 0.18 (bootstrapped standard error [SE] = 0.06, bias corrected 95% CI 0.07–0.31). Given

that the upper and lower bounds of the CI did not contain zero, the indirect effect was significant, implying that PTSD symptomology mediated the association between exposure to discrimination and prescription drug problems. Discrimination was no longer significantly associated with prescription drug problems once PTSD score was included in the model (B = 0.33, p = 0.06), suggesting that PTSD symptomology partially accounted for this association.

Testing Alternative Mediators

Psychological stress and distress scores ranged from 2 to 37 (M = 19.0, SD = 5.90) and 0 to 34 (M = 15.6, SD = 6.16) respectively. The analysis described above was rerun to test these variables as mediators. As shown in Table 3, psychological stress was significantly associated with prescription drug problems (partial r = 0.18, p < 0.05) but not with discrimination (partial r = 0.09, p > 0.05) in an adjusted model. The indirect mean ab value was 0.05 (bootstrapped SE = 0.03, bias corrected 95% CI 0.01–0.13) and thus non-significant, suggesting psychological stress did not mediate the association between experiences of racism and drug problem score. Similarly, psychological distress was associated with prescription drug problems (partial r = 0.24, p < 0.01) but not with discrimination (partial r = 0.01, p > 0.05) in an adjusted model. The indirect mean ab value was 0.007 (bootstrapped SE = 0.05, bias corrected 95% CI 0.09–0.09), suggesting psychological distress did not mediate the association between experiences of racism and drug problem score. In a final step, psychological stress, distress and PTSD scores were examined as mediators in the same model, thus adjusting for the covariance between them. PTSD remained a significant mediator in this model (indirect mean ab value = 0.15, bootstrapped SE = 0.06, bias corrected 95% CI 0.05–0.29). Neither psychological stress nor distress was statistically significant in the omnibus model.

DISCUSSION

High levels of discrimination were reported by Aboriginal adults living in a mid-sized city in western Canada. Discrimination has been associated cross-sectionally with lifetime prescription drug use and prospectively with substance use problems.^{7,32} This study builds on these findings using more proximate measures, documenting a positive association between racial discrimination experienced in the past year and prescription

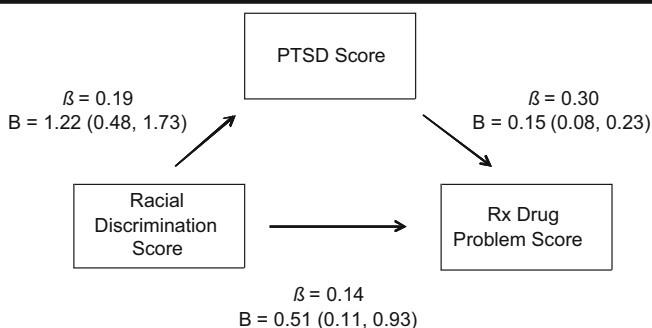


Figure 2. Mediation of association between racial discrimination and prescription drug problems by PTSD symptoms using unstandardized bootstrapped regression coefficients (95% confidence intervals) adjusted for confounders, psychological stress and distress

Table 3. Pearson's *r* correlations between racial discrimination, prescription drug problem score and potential psychological mediators

	1	2	3	4	5
1. Racial discrimination score	1.0	0.16*	0.20**	0.09	0.01
2. Prescription drug score	0.23**	1.0	0.31**	0.18*	0.24**
3. PTSD symptom severity score	0.31**	0.36**	1.0	0.48**	0.32**
4. Psychological stress score	0.21**	0.27**	0.57**	1.0	0.41**
5. Psychological distress score	0.09	0.27**	0.37**	0.45**	1.0

Notes: Zero order correlations are represented below the diagonal (of 1.0 values); partial correlations adjusted for age, gender, education, employment, marital status, life course poverty, enculturation, acculturation, separation from parents in childhood, and abuse in childhood are represented above the diagonal.

* $p < 0.05$; ** $p < 0.01$.

drug problems in the past year. In a fully adjusted model, prescription drug problem score increased by one-half point for each additional situation in which discrimination was experienced in the past year. This increase is substantial given validation studies recommend women with DUDIT scores of 2 and men with DUDIT scores of 6 undergo diagnostic testing for a drug use disorder.^{16,17}

This study also documents a positive association between racism experienced in the past year and PTSD symptoms experienced in the past month that could not be explained by other events such as childhood separation from parents, abuse in childhood and exposure to poverty over the life course. In mediation models, PTSD symptoms explained the association between racial discrimination and prescription drug problems among Aboriginal adults; general psychological stress and distress did not. PTSD symptoms also explained this association when the covariance between psychological mediators was controlled, suggesting that symptoms specific to post-traumatic stress (e.g., feeling watchful/on guard, feeling jumpy, feeling one's future may be cut short) explained the association between discrimination and prescription drug problems rather than general symptoms of stress (e.g., feeling stressed/worried, loss of interest in normal activities, difficulty concentrating).

A model that may be derived from these findings posits that racial discrimination results in states of distress and suffering consistent with PTSD symptoms, and that Aboriginal adults who experience high levels of racism may develop prescription drug problems in their efforts to cope with these experiences. It is acknowledged that the current study cannot infer temporal sequence. However, the form of discrimination measured in this study is based on race, a characteristic that does not vary within an individual over time. Thus, it may be argued that race-based discrimination is a fixed marker over the life course, making it, by definition, an antecedent to outcomes such as PTSD and drug problems.³³ The current findings support this assertion, documenting a positive correlation ($r = 0.49$) between levels of racial discrimination experienced in childhood and levels of discrimination experienced in the past year as an adult.

This study also found that Aboriginal adults living in an urban setting who participated in their cultural traditions experienced a backlash through more frequent experiences of discrimination, replicating previous research in Canada and Australia.^{19,26} Racial identity development, which often includes increased cultural

participation, has been recommended as a coping strategy for racism.³⁴ The current findings combine with others to suggest that this is not enough. Efforts to strengthen Aboriginal identity and cultural continuity in cities must take place alongside efforts to decrease the amount of racial discrimination Aboriginal people experience in the urban environment. These findings also suggest that future research examining the impacts of Aboriginal cultural traditions on health should consider discrimination as a potential confounder of these associations in statistical models.

The limitations of this study include the use of a cross-sectional design, self-report measures and a volunteer sample of participants. Prospective studies are needed to replicate the associations documented and test the temporal sequence of events implied by these findings. Larger samples are needed to replicate the non-significant association between discrimination and illicit drug problems after adjustment for confounders, as this association has been documented both cross-sectionally and longitudinally among other ethnic groups.^{5,7} The strengths of the study include guidance by an Aboriginal Advisory Committee, past-year assessments of exposures and outcomes, the use of validated measures, adjustment for confounders, and the testing of alternative mediators.

CONCLUSIONS

Most efforts to address Aboriginal health inequities in Canada have focused on the role Aboriginal people play in these disparities and the changes these populations need to make to resolve them. The current findings combine with others to call for an expanded focus. Non-Indigenous Canadians may also play a role in the health inequities observed. Discrimination arises from social arrangements that are potentially remedial.¹⁰ The findings of this study suggest efforts to reduce the amount of racial discrimination experienced by Aboriginal adults in cities may reduce PTSD symptomology and prescription drug problems in these populations.

REFERENCES

- Hasin DS, Hatzenbuehler M, Smith S, Grant BF. Co-occurring DSM-IV drug abuse in DSM-IV drug dependence: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug Alcohol Depend* 2005;80(1):117–23. PMID: 16157234.
- Currie CL, Wild TC. Adolescent use of prescription drugs to get high in Canada. *Can J Psychiatry* 2012;57(11):745–51. PMID: 23228233.
- Pascoe EA, Smart Richman L. Perceived discrimination and health: A meta-analytic review. *Psychol Bull* 2009;135(4):531–54. PMID: 19586161. doi: 10.1037/a0016059.
- Chae DH, Nuru-Jeter AM, Adler NE, Brody GH, Lin J, Blackburn EH, et al. Discrimination, racial bias, and telomere length in African-American men. *Am J Prev Med* 2014;46(2):103–11. PMID: 24439343. doi: 10.1016/j.amepre.2013.10.020.
- Flores E, Tschann JM, Dimas JM, Pasch LA, de Groat CL. Perceived racial/ethnic discrimination, posttraumatic stress symptoms, and health risk behaviors among Mexican American adolescents. *J Couns Psychol* 2010; 57(3):264–73. PMID: 21133578. doi: 10.1037/a0020026.
- Kaholokula JK, Grandinetti A, Keller S, Nacapoy AH, Kingi TK, Mau MK. Association between perceived racism and physiological stress indices in Native Hawaiians. *J Behav Med* 2012;35(1):27–37. PMID: 21360284. doi: 10.1007/s10865-011-9330-z.
- Fuller-Rowell TE, Cogburn CD, Brodish AB, Peck SC, Malanchuk O, Eccles JS. Racial discrimination and substance use: Longitudinal associations and identity moderators. *J Behav Med* 2012;35(6):581–90. PMID: 22113318. doi: 10.1007/s10865-011-9388-7.
- Jones JM. *Prejudice and Racism*. New York, NY: McGraw-Hill Inc, 1997.
- Carter RT. Racism and psychological and emotional injury: Recognizing and assessing race-based traumatic stress. *Couns Psychol* 2007;35(13):13–105. PMID: 25581238. doi: 10.1177/0011000006292033.

10. Varcoe C, Browne AJ, Ponc P. *Promising Theoretical Contributions to the Measurement of Racial Discrimination: Critical Literature Review*. Ottawa: Public Health Agency of Canada, 2013.
11. Lewis TT, Cogburn CD, Williams DR. Self-reported experiences of discrimination and health: Scientific advances, ongoing controversies, and emerging issues. *Annu Rev Clin Psychol* 2015;11:407–40. doi: 10.1146/annurev-clinpsy-032814-112728.
12. Loo CM, Fairbank JA, Chemtob CM. Adverse race-related events as a risk factor for posttraumatic stress disorder in Asian American Vietnam veterans. *J Nerv Ment Dis* 2005;193(7):455–63.
13. Waelde LC, Pennington D, Mahan C, Mahan R, Kabour M, Marquett R. Psychometric properties of the Race-Related Events Scale. *Psychol Trauma Theory Res Pract Policy* 2010;2(1):4–11. doi: 10.1037/a0019018.
14. Chou T, Asnaani A, Hofmann SG. Perception of racial discrimination and psychopathology across three U.S. ethnic minority groups. *Cultur Divers Ethnic Minor Psychol* 2012;18(1):74–81. PMID: 21967527. doi: 10.1037/a0025432.
15. Seng JS, Lopez WD, Sperlich M, Hamama L, Reed Meldrum CD. Marginalized identities, discrimination burden, and mental health: Empirical exploration of an interpersonal-level approach to modeling intersectionality. *Soc Sci Med* 2012;75:2437–45. PMID: 23089613. doi: 10.1016/j.socscimed.2012.09.023.
16. Berman AH, Bergman H, Palmstierna T, Schlyter F. Evaluation of the Drug Use Disorders Identification Test (DUDIT) in criminal justice and detoxification settings and in a Swedish population sample. *Eur Addict Res* 2005;11(1):22–31. PMID: 15608468. doi: 10.1159/000081413.
17. Voluse AC, Gioia CJ, Sobell LC, Dum M, Sobell MB, Simco ER. Psychometric properties of the Drug Use Disorders Identification Test (DUDIT) with substance abusers in outpatient and residential treatment. *Addict Behav* 2012;37(1):36–41. PMID: 21937169. doi: 10.1016/j.jaddbeh.2011.07.030.
18. Krieger N, Smith K, Naishadham D, Hartman C, Barbeau EM. Experiences of discrimination: Validity and reliability of a self-report measure for population health research on racism and health. *Soc Sci Med* 2005;61:1576–96. PMID: 16005789.
19. Currie CL, Wild TC, Schopflocher DP, Laing L, Veugelers P. Racial discrimination experienced by aboriginal university students in Canada. *Can J Psychiatry* 2012;57(10):617–25. PMID: 23072953.
20. Weathers FW, Litz B, Herman D, Huska JA, Keane TM. The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility. Paper Presented at the Annual Convention of the International Society for Traumatic Stress Studies. San Antonio, TX, 1993.
21. McDonald SD, Calhoun PS. The diagnostic accuracy of the PTSD Checklist: A critical review. *Clin Psychol Rev* 2010;30(8):976–87. PMID: 20705376. doi: 10.1016/j.cpr.2010.06.012.
22. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav* 1983;24(4):385–96. PMID: 6668417.
23. Goldberg DP, Hillier VF. A scaled version of the General Health Questionnaire. *Psychol Med* 1979;9(1):139–45. PMID: 424481. doi: 10.1017/S0033291700021644.
24. Anda RF, Felitti VJ, Bremner JD, Walker JD, Whitfield C, Perry BD, et al. The enduring effects of abuse and related adverse experiences in childhood. A convergence of evidence from neurobiology and epidemiology. *Eur Arch Psychiatry Clin Neurosci* 2006;256(3):174–86. PMID: 16311898. doi: 10.1007/s00406-005-0624-4.
25. Ryder AG, Alden LE, Paulhus DL. Is acculturation unidimensional or bidimensional? A head-to-head comparison in the prediction of personality, self-identity, and adjustment. *J Pers Soc Psychol* 2000;79(1):49–65. PMID: 10909877. doi: 10.1037/0022-3514.79.1.49.
26. Dockery AM. *Traditional Culture and the Wellbeing of Indigenous Australians: An Analysis of the 2008 NATSISS*. Perth, Australia: Centre for Labour Market Research, 2011.
27. Paradies Y, Cunningham J. Experiences of racism among urban Indigenous Australians: Findings from the DRUID study. *Ethn Racial Stud* 2009; 32(3):548–73. doi: 10.1080/01419870802065234.
28. Preacher KJ, Hayes AF. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav Res Methods* 2008;40(3):879–91. PMID: 18697684. doi: 10.3758/BRM.40.3.879.
29. Jaccard J, Turrisi R. *Interaction Effects in Multiple Regression*. Newbury Park, CA: Sage; 2003.
30. Anderson C. *Aboriginal Edmonton: A Statistical Story-2009*. Edmonton, AB: Author, 2010.
31. Krieger N, Carney D, Lancaster K, Waterman PD, Kosheleva A, Banaji M. Combining explicit and implicit measures of racial discrimination in health research. *Am J Public Health* 2010;100(8):1485–92. PMID: 19965567. doi: 10.2105/AJPH.2009.159517.
32. Gee GC, Delva J, Takeuchi DT. Relationships between self-reported unfair treatment and prescription medication use, illicit drug use, and alcohol dependence among Filipino Americans. *Am J Public Health* 2007;97(5): 933–40. PMID: 16809581.
33. Vogt DS, King DW, King LA. Risk pathways for PTSD: Making sense of the literature. In: Friedman MJ, Keane TM, Resick PA (Eds.), *Handbook of PTSD: Science and Practice*. London, UK: The Guilford Press, 2010.
34. Brondolo E, Brady Ver Halen N, Pencille M, Beatty D, Contrada RJ. Coping with racism: A selective review of the literature and a theoretical and methodological critique. *J Behav Med* 2009;32(1):64–88. PMID: 19127420. doi: 10.1007/s10865-008-9193-0.

Received: January 16, 2015

Accepted: June 5, 2015

RÉSUMÉ

OBJECTIFS : 1) Examiner les associations entre la discrimination raciale et les problèmes de toxicomanie chez les adultes autochtones en milieu urbain; et 2) déterminer si ces associations s'expliquent mieux par les symptômes du stress psychologique, de la détresse ou de l'état de stress post-traumatique (ESPT).

MÉTHODE : Les données ont été recueillies au moyen de questionnaires administrés en personne auprès d'un échantillon communautaire d'adultes autochtones (N = 371) vivant dans une ville de taille moyenne de l'Ouest canadien en 2010. Les associations ont été examinées à l'aide de modèles de régression linéaire avec rééchantillonnage (bootstrap) ajustés en fonction de facteurs confusionnels, les résultats étant les notes obtenues par rapport aux ordonnances continues de médicaments et aux abus de drogues illicites. Nous avons examiné la médiation à l'aide des produits croisés de la méthode des coefficients.

RÉSULTATS : Plus de 80 % des adultes autochtones avaient subi de la discrimination raciale au cours de l'année antérieure, la majorité indiquant des niveaux élevés de discrimination durant cette période. La discrimination au cours de l'année antérieure était un facteur de risque pour les symptômes d'ESPT et les abus de médicaments sur ordonnance dans les modèles ajustés en fonction des facteurs confusionnels et d'autres formes de traumatisme psychologique. Dans les modèles de médiation, les symptômes d'ESPT expliquaient l'association entre la discrimination et l'abus de médicaments sur ordonnance; le stress psychologique et la détresse ne l'expliquaient pas. Les symptômes d'ESPT expliquaient aussi cette association après ajustement pour tenir compte de la covariance entre les médiateurs. Les résultats montrent également que la participation aux traditions culturelles autochtones était associée à une discrimination accrue.

CONCLUSION : La plupart des efforts pour aborder les iniquités en santé chez les Autochtones du Canada portent sur le rôle joué par les Autochtones dans ces disparités. Nos constatations, combinées à celles d'autres chercheurs, justifient un élargissement de cette perspective. Les Canadiens non autochtones pourraient aussi jouer un rôle dans les iniquités en santé observées. Les constatations de notre étude indiquent que des efforts pour réduire la discrimination vécue par les adultes autochtones dans les villes pourraient réduire les symptômes d'ESPT et les abus de médicaments sur ordonnance dans ces populations.

MOTS CLÉS : Indiens d'Amérique nord; discrimination raciale; médicaments sur ordonnance; stress post-traumatique; Canada