transcultural psychiatry

March 2000

ARTICLE

Psychological Distress Among the Cree of James Bay

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Abstract The object of this study was to identify potential risk and protective factors associated with psychological distress among the Cree of James Bay, through a secondary analysis of data on 1136 Cree (aged 15–85) from a random general population health survey in 1991. In multiple linear distress in the past week included: younger age, female gender, early loss of a parent or close relative, more life events in the year before the survey, a

Vol 37(1): 35–56[1363–4615(200003)37:1;35–56;011654]

serious illness or drinking problem in the past year, ever having used cannabis, having more than elementary education, having fewer than five close friends/relatives and residing in an isolated or inland region. Having a good relationship with others in the community and spending more time in the bush were both associated with less distress. The relative importance of these factors varied across age/gender cohorts. We conclude that gender and generational differences should be considered when planning mental health promotion strategies for this population. In addition to more conventional approaches to reduce alcohol abuse, improve coping with loss and increase social support, targeted programs should be developed addressing the impact of education and role strain for women.

Key words Cree • culture change • indigenous people • psychological distress • substance use

Introduction

Among Native peoples in North America, there is wide variation in the levels of mental health and illness in different nations and communities. Likely due to the effects of economic disparity, discrimination, loss of culture and even cultural genocide, some aboriginal groups show evidence of severe psychological distress (with high rates of depression, suicide, violence, alcoholism and substance abuse) (H. Armstrong, 1993; Kirmayer, 1994). Retention of traditional cultural practices has been related to well-being and community wellness in ethnographic studies (Adelson, 1998) but there are few epidemiological data that address these issues (Chandler & Lalonde, 1998).

In 1991, Santé Québec, a provincial health authority, conducted a large-scale survey in all the Cree communities in the James Bay region (Santé Québec, 1994). The survey included a series of 14 questions to assess level of psychological distress during the past week; a similar instrument was used in a general population survey carried out in Quebec in 1992. We used data from the 1991 survey to study the possible association of psychological distress level with a number of social factors identified from the literature, as well as from clinical and research experience. The factors included the following survey items: socio-demographic characteristics, alcohol and substance use variables, significant life events, participation in traditional activities, indicators of social support, and medical and psychiatric history. Given the recent history of the James Bay Cree, different age cohorts have had substantially different social experiences. Consequently, we repeated our global analyses for cohorts defined according to gender and age.

Background

The Cree of James Bay, who currently number about 13,500 persons (MSSS, 1999), live in nine communities in the subarctic northwestern region of Quebec, Canada (an area of about 3000 km^2). They represent about 25% of the total aboriginal population in Quebec (Atkinson & Magonet, 1990). Over a span of 250 years, the Cree have undergone radical transformations of their way of life. The Cree have lived in the James Bay region for at least 5000 years according to archeological records. Before the arrival of Europeans, they relied on hunting bear, caribou and other smaller game, with emphasis placed on self-sufficiency, oral tradition and extended family structure (Salisbury, 1986). Hunting followed a specific patterned use of resources with circular routes, which brought them back into contact with other family members (and later, traders at posts), most often in the summer. Sharing, acute sensitivity to natural cycles and systems, clear separation of roles along gender lines, and preservation of family and kinship were core traditional values. Hunting and fishing had significance at many levels – economic, cultural, social and spiritual (Tanner, 1979).

The arrival of European fur traders in the James Bay region in the late 1600s led to a trading relationship with the Cree and the establishment of company posts. Christian missions were set up in the region in the mid-1800s and later were in charge of residential schools; in the 1950s and 1960s many James Bay Cree were sent to residential schools in Ontario. Permanent villages were established and biomedical services were developed in the region, with a hospital being opened in one community in 1930. Settlement at trading post sites and living in close quarters led to epidemics of infectious diseases which caused many deaths in the first half of the twentieth century (Sturtevant, 1981; TK Young, 1994).

In 1975, the James Bay and Northern Quebec Agreement enabled vast hydroelectric development, with resultant flooding of traditional lands, in exchange for monetary compensation, a formal land claims settlement, provisions for environmental and traditional activity protection and a degree of Cree control of various sectors including education, health and social services (Salisbury, 1986). The Cree have continued to be politically active and have successfully challenged provincial government plans for further hydroelectric development. Local self-government of the Cree communities was legislated in 1984 with the Cree-Naskapi (of Quebec) Act.

The Cree population has been growing in size and is younger than the Quebec population as a whole; 35% of the James Bay Cree are under 15 years compared with 16% of the Quebec population, and the median age among the Cree is 20.8 (versus 34.2 for Quebec; Santé Québec, 1994). Currently, youth are educated within the communities through high

school. There is some out-migration for employment or education outside the region, but a large proportion of those who leave for schooling return to their communities at a later time. The region has a mixed subsistence and wage economy, with three main groups: full-time hunters and trappers, full-time wage earners (employed either by Cree agencies or private companies), and those with casual or seasonal waged work. Hunting and living in the bush are important to all three of these groups.

Little has been published about mental health and illness among the Cree of the James Bay region (Prince, 1993). A study of mental health service use between 1986 and 1988 found that depression was the most common psychiatric illness, at 16.5%, among 242 Cree receiving help from nursing and medical personnel in the region (Lavallée, Robinson, & Laverdure 1991). When gender-specific rates were examined, depression remained the most common problem for females, while alcohol abuse was the most prevalent for males. Only 13% of Cree trappers and hunters received mental health services although they make up 35% of the population. This observation could reflect either lower rates of mental health problems in this group or simply lower use of services. The study did not allow any conclusions to be made about the prevalence of psychiatric problems in the general population.

Unlike many other aboriginal populations in Canada, including some other Cree and Ojibway groups, the James Bay Cree have a suicide rate no higher than that among non-aboriginal Canadians (Kirmayer, 1994; Petawabano, Gourdeau, Jourdain, Palliser-Tulugak, & Cossette, 1994). Studies of completed suicides during 1975–1981 (Robinson, 1985) and 1982–1986 (Courteau, 1989) did not find greater mortality among the James Bay Cree, nor do death statistics from 1982–1991 (Barss, 1998a), which showed that one person completed suicide each year on average. The 10-year study did find about eight times as many hospitalizations for suicide attempts as deaths, and estimated that as many as 18 other attempts could have occurred for each hospitalized case. A general population survey carried out in the region in 1991 found that 5% of respondents reported suicidal thoughts in their lifetime and 4% reported a previous suicide attempt (Santé Québec, 1994); when age-standardized, the prevalence of attempts was not statistically different from that for the rest of Quebec in a 1987 survey, and the prevalence of ideation was significantly lower. The 10-year study by Barss (1998b), however, found that James Bay Cree, who are more likely to have guns in their homes than other Canadians, were 2.5 times more likely to die and nine times more likely to be hospitalized from a gunshot wound than the general Quebec population. Firearm-related injuries included suicides and attempts, homicides and assaults, and unintentional shootings. It is not clear whether these statistics reflect a higher level of violence in the region or can be accounted for

by the greater accessibility to guns. Deaths from injuries were significantly higher among the James Bay Cree than in the general Quebec population for the period 1987–1992, particularly in the case of drownings and motor vehicle accidents (Saint-Pierre, 1995).

Method

Sample

Data for this study came from the Santé Québec Health Survey among the Cree of James Bay. This survey was designed to collect data on the physical, psychological and social health of the Cree population in the region, which numbered 1716 private households and about 9300 persons in 1991. The survey methods are described in detail elsewhere (Santé Québec, 1994). Briefly, 400 households in nine communities were sampled during the summer of 1991. The sample was stratified in proportion to the size of the individual communities; in each community, systematic sampling was then carried out using the list of household addresses. Of the 400 households approached, a total of 354 (1999 persons) agreed to participate in the survey. Permission to conduct secondary analysis of the data was obtained from both Santé Québec and the Cree Board of Health and Social Services of James Bay (the Cree institution responsible for health care in the region). To ensure anonymity for respondents from these small communities, we received a dataset from which community identification had been removed. Data were available for 1136 persons 15 years of age and older who answered the confidential questionnaire containing the psychological distress items.

Measures

The instruments used by Santé Québec included an interviewer-assisted confidential questionnaire for those aged 15 years and older, a face-to-face interview with an individual questionnaire for those aged 15 years and older, and a face-to-face household questionnaire for a designated adult respondent. The health survey was translated into Cree in as standardized a manner as possible for use with unilingual Cree-speakers. All of the interviewers were Cree and the survey instruments were administered in the respondent's choice of English or Cree (or both).

Psychological Distress. The measure of psychological distress was based on a 14-item index adapted by Santé Québec from the Ilfeld Psychiatric Symptom Index (Boyer, Préville, Légaré, & Valois, 1993; Ilfeld, 1976). The Santé Québec (1994) index contained 14 statements addressing

psychological symptoms experienced in the previous week (Figure 1). The distress measure was subjected to focus group discussion with representatives of the Cree community to test its content validity (Santé Québec, 1994); however, the only adaptation made to the index was the re-wording of one question ('how often have you felt lonely?' was replaced with 'how often have you felt like being alone?').[1]

Each item had four possible responses coded as: 0 = never, 1 = once in a while, 2 = fairly often and 3 = very often. The index score was calculated by summing the responses to the questions answered, dividing the sum by the number of questions answered multiplied by a factor of 3 (the highest response value), and then multiplying this result by 100. The valid score thus ranged from a minimum of 0 to a maximum of 100. Reliability and factor analysis of these items among the Cree respondents showed high internal consistency (Cronbach's alpha = 0.94), with one factor accounting for 54.7% of the variance. In terms of validation of the index, significant positive associations were found between psychological distress level and previous suicidal ideation, previous suicide attempt, stress level associated with a number of significant life events in the past year and feeling 'not too happy' at the time of the survey.

Socio-demographic Characteristics. 'Unemployed' included those collecting unemployment insurance or welfare, as well as those who specified that they were 'unemployed,' 'looking for a job,' 'out of school' or '[doing] nothing.' Persons attending school, retired persons and homemakers were not considered as unemployed. 'Working full- or part-time' included those with full-time, part-time or occasional work, as well as the self-employed and hunters/trappers receiving income security.

Although individual community identification was removed from the dataset, Santé Québec classified the respondents according to whether they

In the past week, did you . . .
- feel hopeless about the future
- have your mind go blank
- feel down or blue
- feel tense or under pressure
- lose your temper
- feel bored or have little interest in things
- feel fearful or afraid
- have trouble remembering things
- cry easily or feel like crying
- feel nervous or shaky inside
- feel critical of others
- feel easily annoyed or irritated
- get angry over things that are not too important
- feel like being alone

Figure 1. Items in the psychological distress measure.

resided in one of the four inland communities or one of the five coastal communities of James Bay. Secondly, the respondents were classified according to whether they resided in an isolated region not accessible by road except in winter in some cases or in a nonisolated area accessible by road throughout the year. Each of the four inland communities is road-accessible and nonisolated; one of the coastal communities is also accessible by road. The educational level of each respondent was coded in a dichotomous manner to indicate those with primary (elementary) school education or no formal schooling versus those with at least some secondary school education.

Alcohol and Substance Use. A respondent was considered to have had a drinking problem in the past year if he/she reported at least one incident resulting from alcohol use in the previous 12 months (including failure to carry out personal duties at school or work, health problems or injury, drunk driving, hospitalization or admittance to a treatment center, and social or relationship problems) *and* answered 'yes' to at least two of the following questions: (i) 'Have you had a drink first thing in the morning to calm nerves or a hangover in the past year?' (ii) 'Have you ever been criticized by people around you because of your drinking?' (iii) 'Have you ever felt you should cut down on your drinking?' (iv) 'Have you ever felt bad/guilty about your drinking?' These four questions form the CAGE index, used to identify drinkers at risk for alcohol dependence, and previously implemented in the 1987 Santé Québec survey (Mayfield, McLeod, & Hall, 1974).

With respect to substance use, respondents were asked whether they had ever used cocaine or crack (labeled as 'cocaine' in Tables 1–4) and marijuana or hashish ('cannabis' in Tables 1–4). They were also asked if they had ever tried to 'get high' by sniffing glue, gasoline or any other solvents ('solvents' in Tables 1–4). These three variables were coded in a dichotomous manner: whether the substance had ever been consumed or not.

Significant Life Events. Respondents were asked if they had experienced any of six different significant life events in the previous 12 months: a move away from family, loss of a job, rejection or disapproval from the community, death of a spouse, death of someone else 'very close' to the respondent, or a serious physical or mental illness in a household member. Early loss was represented by the experience of the death of a parent or close family member when the respondent was a child, under the age of 12 years.

Participation in Traditional Activities. Respondents were asked how many weeks they had spent in the bush in the past year.

Social Support. Participants were asked 'Other than on special occasions, such as weddings, funerals or baptisms, how often did you attend services or meetings connected with your religion in the past 12 months?' Those who responded with 'at least once a week' or 'at least once a month' were classified as regular church attenders. It should be pointed out that this question did not explicitly ask about traditional and spiritual healing practices.

In response to the question 'How would you describe your relationship with other people in your community?' the following options were available: 'very satisfactory,' 'somewhat satisfactory,' 'somewhat unsatisfactory' and 'very unsatisfactory.' Respondents were considered to have a good relationship with the community if they answered 'very satisfactory.' The number of people (friends or family members) to whom the respondent could turn if he/she needed help or had a problem was retained in the dichotomous format used by Santé Québec, namely 0–4 persons versus 5 or more persons.

Medical and Psychiatric History. Data on chronic medical illness and psychiatric problems came from the household questionnaire answered by an adult representative. A chronic medical illness in an individual's lifetime included having any one of a list of 23 health problems, such as anemia, allergies, arthritis or rheumatism, cancer, diabetes, digestive problems, heart disease, hearing troubles, incapacity due to being overweight and migraine or recurring headaches. A lifetime psychiatric symptom or problem included having experienced any of the following: depression, periods of excessive nervousness or irritability, periods of confusion or memory loss, hearing voices, having visions or being afraid without reason for 6 months or more, or believing his/her mind was affected by a curse.

Data Analysis

Differences in means between two independent groups were tested with the Student's *t*-test. A Pearson correlation coefficient was calculated for the association between two continuous variables. Simple linear regression models containing one independent variable were used to measure the association between possible risk or protective factors and psychological distress (the dependent variable) in terms of a beta coefficient. To determine which variables to include in subsequent multivariate models for the age/gender cohorts, a less restrictive *p*-value of .10 or less (two-tailed) was used to indicate a statistically significant result. Multivariate linear regression was used to identify the factors that were most strongly associated with the level of psychological distress. Stepwise backward selection was used to eliminate nonsignificant independent variables from the regression models. Interpretation of results was aided by extensive ethnographic fieldwork in

the region by Adelson and Tanner guided by the epidemiological research findings, as well as by discussions with representatives of the Public Health Module – Cree Region.

Results

Table 1 describes the characteristics of the study sample. We present unadjusted frequencies for the 1136 respondents included in our study; weighted population frequencies have been reported previously by Santé Québec in their survey report, and differed only by 1.3% on average (minimum: 0.1%, maximum: 3.2%) from our figures (Santé Québec, 1994). Continuous variables are not included in Table 1, but are described below.

The average age of the respondents was 33.1 years (± 15.3). Forty-seven percent of the study subjects reported at least one significant life event in the last year including: death of a spouse or close friend/family member (27%); moving away from their family (13%); serious illness in the household

TABLE 1
Characteristics of the study sample (n = 1136)

	% (unadjusted)
Gender (% female)	52.0
Married or common-law	54.4
Occupational status	
student	4.5
working full- or part-time	67.2
homemaker	13.4
retired	2.1
unemployed/welfare	10.7
More than elementary education	68.0
Resides in inland region	33.6
Resides in isolated region	34.7
Attended church less than once a month in past year	52.8
Alcohol and drug use	
drinking problem in past year	28.3
used cannabis in lifetime	38.2
used cocaine in lifetime	7.4
used solvents in lifetime	10.2
Serious illness in past year	6.2
Chronic medical illness in lifetime*	39.0
Psychiatric problem in lifetime*	3.1
Death of a close relative when under 12 years old	57.4
Good relationship with community	46.0
Has five or more friends	41.0

* According to household respondent.

(10%); rejection/disapproval from the community (7%); or losing their job (3%). The number of persons in the household varied from a minimum of two to a maximum of 13 with an average of 6.5 persons (± 2.5). The average number of weeks spent in the bush in the past year was 8.5 (± 10.8); for those who spent at least some time in the bush (81% of the study sample), the total number of weeks varied from 0.5 to 48 weeks with an average of 9.6 (± 11.0).

A total of 21 factors were selected from the questionnaire items and analyzed with respect to psychological distress level for the 1111 subjects who answered all 14 of the distress questions. Table 2 presents the results

TABLE 2
Results of simple and multivariate regression analyses on entire sample

Factors	*Simple regression*	*Multivariate regression (reduced model[a])*		
	n = *1111* β	n = *833* β	*SE*	*p-value*
Age	−.31‡	−.89[b]	.041	.03
Female gender	2.30†	2.82	.91	.002
Single	4.27‡			
Unemployed	4.23†			
More than elementary education	9.91‡	5.93	1.34	<.001
Resides in inland region	2.58†	4.39	1.12	<.001
Resides in isolated region	NS	3.77	1.11	<.001
Attended church less than once a month in past year	3.19‡			
Drinking problem in past year	8.89‡	4.83	1.06	<.001
Used cannabis in lifetime	8.21‡	2.10	1.07	.05
Used cocaine in lifetime	6.54‡			
Used solvents in lifetime	8.36‡			
Serious illness in past year	4.99†			
Chronic medical illness in lifetime[c]	−2.83†			
Psychiatric problem in lifetime[c]	NS			
Death of a close relative when under 12 years old	NS	2.04		.03
Good relationship with community	−7.53‡	−3.61		<.001
Has fewer than five friends	1.63*	2.36		.009
Number of significant life events in past year	3.44‡	2.82[d]		<.001
Number of persons in household	NS			
Number of weeks spent in the bush in past year	−.29‡	−1.07[e]		.004
Constant	NA	23.02	3.34	<.001
				$R^2 = .28$

NA, not applicable; NS, not significant; *$p < .10$; †$p < .01$; ‡$p < .001$.
[a] β, SE, (standard error of β) and *p* noted only if significant.
[b] For each increase of 10 years.
[c] According to household respondent.
[d] For each additional life event.
[e] For each increase of 8 weeks.

of regression analyses, with psychological distress level as the dependent variable. A large number of factors was significant in simple linear regression models. Although the substantial number of factors studied increases the possibility of falsely positive tests, the use of a restrictive Bonferroni correction to the significance levels (where the corrected p-value = .05/21 or .0024) still resulted in 11 statistically significant results.

For the 833 persons with complete data, all of the factors were entered as independent variables in a multivariate linear regression model, with psychological distress level as the dependent variable. Backward selection was used to remove all nonsignificant independent variables ($p > .05$) in a stepwise manner. The reduced model, which contained 12 independent variables, explained 28% of the variance in level of distress. The following variables were associated with a higher level of psychological distress ($p < .05$): female gender, having more than elementary (primary) education, residing in an inland region, residing in an isolated region, having a drinking problem in the past year, use of cannabis in lifetime, death of a close relative when a child, having fewer than five friends (i.e. close contacts) and a greater number of life events in the past year. Age, type of relationship with others in the community and time in the bush were negatively associated with psychological distress: older age, having a good relationship with the community and more time spent in the bush in the past year were associated with a lower level of distress.

Following the above analysis on the entire sample, the study sample was divided into eight groups by gender and age (15–24 years, 25–44 years, 45–64 years or 65 years and older). Table 3 shows the results of bivariate analyses carried out with 19 factors (no age or gender variables) in each of the eight groups or cohorts. The cells of the table present, for dichotomous factors, the percentage of persons with each attribute listed; for continuous variables, the Pearson correlation coefficient is presented.

The factors found to be significant in the bivariate tests were analyzed further with multivariate linear regression models. Owing to the small numbers, the two groups of persons aged 65 years and older were not included in this analysis. For each of the six remaining age/gender cohorts, all of the significant factors in Table 3 (with $p \leq .10$) were included as independent variables in regression models, except if the attribute was present in < 5% of the respondents. In addition, three factors of interest (number of life events in the past year, educational level and number of weeks spent in the bush) were included as independent variables in each full model, regardless of their bivariate significance level, since it is possible that an association could be masked in the bivariate analysis. Stepwise backward selection was used to remove nonsignificant independent variables, resulting in reduced models.

Table 4 presents the reduced models for each cohort. For males 15–24

TABLE 3

Summary of bivariate analysis in each age/gender cohort: Association between psychosocial and socio-demographic factors and level of psychological distress

	Percentage of respondents with factor or Pearson correlation coefficient (r =)							
	15–24 years		*25–44 years*		*45–64 years*		*65 years and older*	
Factor	*Males* n = *194*	*Females* n = *228*	*Males* n = *228*	*Females* n = *228*	*Males* n = *97*	*Females* n = *109*	*Males* n = *26*	*Females* n = *26*
Single	83	75*	32	24	8.3	22	19	54
Unemployed	16	16	10	7.8	5.2	6.5	0	0
More than elementary education	90*	93†	78	77	20¶	13¶	3.8	0
Resides in inland region	37	32	31	32†	33	42*	35	38
Resides in isolated region	29	34‡	35	33	38	33	50	46
Attended church less than once a month in past year	68	51	58	36	28	21	19	32
Drinking problem in past year	54†	35¶	37¶	13‡	14	8.3	7.7	3.8
Used cannabis in lifetime	41	52‡	59‡	31¶	4.2‡	2.9¶	0	0
Used cocaine in lifetime	12*	8.6	17*	2.4*	0	0	0	0
Used solvents in lifetime	20*	19‡	11	5.7	0	0	0	0
Serious illness in past year	8†	7.6‡	5.0	5.1	7.3	4.6	15	0
Chronic medical illness in lifetime[a]	16	26	28	45	47	74	50	85
Psychiatric problem in lifetime[a]	1.1	1.8	0	4.1	6.2	11	0	3.8
Death of a close relative when under 12 years old	52¶	58¶	59	52	80	81	64	77
Good relationship with community	42‡	36‡	44¶	44	70†	65¶	77	54
Has fewer than five friends	50†	60†	40	57	52	60	67	88
Number of life events in past year	$r = .27$¶	$r = .33$¶	$r = .09$	$r = .15$†	$r = .23$†	$r = -.14$	$r = -.05$	$r = .56$‡
Number of persons in household	$r = -.04$	$r = -.004$	$r = -.09$	$r = -.08$	$r = -.15$	$r = -.08$	$r = .14$	$r = -.008$
Number of weeks spent in the bush in past year	$r = -.12$	$r = -.09$	$r = -.13$*	$r = -.11$	$r = -.28$‡	$r = -.09$	$r = .14$	$r = .02$

*$p \leq .10$; † $p \leq .05$; ‡ $p \leq .01$; ¶$p \leq .001$ for the comparison of psychological distress level in those with the factor versus those without the factor or the correlation between psychological distress level and a count (mean level of distress higher for those with the factor indicated for all significant comparisons except where a negative correlation coefficient was observed).

[a] According to household respondent.

TABLE 4
Results of multivariate regression analyses in age/gender cohorts

Significant factors in reduced model	*Beta coefficient*	*Significance level*
Males, 15–24 years	$N = 140$	adj. $R^2 = 18.0$
Death of a close relative when under 12 years old	6.62	.005
Good relationship with community	−4.67	.041
Has fewer than five friends	4.70	.038
Number of significant life events in past year	4.46	.001
Number of weeks spent in the bush in past year	−1.54	.087
Other factors in full model: more than elementary education, drinking problem in past year, used cocaine in lifetime, used solvents in lifetime, serious illness in past year		
Females, 15–24 years	$N = 167$	adj. $R^2 = 26.1$
Death of a close relative when under 12 years old	6.04	.010
Good relationship with community	−4.26	.078
Has fewer than five friends	7.11	.002
Number of significant life events in past year	5.24	<.001
More than elementary education	8.51	.056
Resides in isolated region	6.50	.010
Drinking problem in past year	6.09	.014
Other factors in full model: single, used cannabis in lifetime, used solvents in lifetime, serious illness in past year, number of weeks spent in the bush in past year		
Males, 25–44 years	$N = 200$	adj. $R^2 = 12.0$
Drinking problem in past year	6.27	.001
Good relationship with community	−5.64	.003
Number of weeks spent in the bush in past year	−1.29	.074
Other factors in full model: more than elementary education, used cannabis in lifetime, used cocaine in lifetime, number of significant life events in past year		
Females, 25–44 years	$N = 194$	adj. $R^2 = 11.6$
Drinking problem in past year	7.76	.012
More than elementary education	4.36	.079
Resides in inland region	3.98	.083
Used cannabis in lifetime	6.48	.003
Other factors in full model: number of life events in past year, number of weeks spent in bush in past year		
Males, 45–64 years	$N = 94$	adj. $R^2 = 18.9$
More than elementary education	8.95	<.001
Good relationship with community	−4.63	.019
Other factors in full model: drinking problem in past year, number of significant life events in past year		
Females, 45–64 years	$N = 101$	adj. $R^2 = 15.3$
More than elementary education	8.64	.010
Good relationship with community	−7.78	<.001
Other factors in full model: resides in inland region, drinking problem in past year, number of significant life events in past year, number of weeks spent in the bush in past year		

years old, four factors were independently associated with psychological distress level. Having experienced while a child the death of a close relative and having fewer than five close friends or relatives were both associated with an increase in psychological distress level. Each additional life event experienced in the year before the survey was associated with an increase of 4.5 units in distress level. Having a good relationship with others in the community was associated with significantly less distress. In addition, there was a trend for the number of weeks spent in the bush in the past year to be negatively associated with distress, so that each additional 8 weeks in the bush decreased distress level by 1.5 units.

For females 15–24 years old, a similar pattern was seen with early loss, having fewer close friends/relatives and a greater number of life events being associated with more distress. Unlike males in this age group, time spent in the bush did not remain in the reduced model for females, and there were additional significant associations: distress level increased by 6.5 units for those residing in an isolated region and by 6.1 units for those with a drinking problem. Having more than elementary education was associated with more distress with a p-value of .056.

The two groups of 25–44-year-olds in the multivariate analyses were similar in that a drinking problem was associated with more psychological distress for both genders. As for the younger cohorts, there was a trend for more time spent in the bush to be associated with lower levels of distress for males, while more education was correlated with higher levels of distress for females. Having a good relationship with others in the community was significantly associated with less distress for males. Distress level was higher for those females who reported using cannabis in their lifetime. Residing in the inland region also tended to be correlated with more distress for females.

For the 45–64-year-old age group a strong association was found for both genders between having at least some secondary education and higher psychological distress, and between having a good relationship with others in the community and lower distress. None of the other factors considered for these analyses were significant in the reduced models.

Discussion

This secondary analysis of respondents in the Santé Québec Cree survey identified personal and social factors associated with psychological distress. When the sample as a whole (N = 833 with complete data) was analyzed in a multivariate linear regression model (controlling for age and gender), the following factors were significantly associated with reporting greater distress in the past week: younger age, female gender, having more than elementary education, residing in an inland region, residing in an

isolated region, having a drinking problem in the past year, ever having used cannabis, early loss of a close relative, not having a good relationship with the community, having fewer than five close friends/relatives, having had more significant life events in the year before the survey and spending less time in the bush in the past year. Although it is clear that other factors, not tested here, could play a role in determining psychological distress, the multivariate model explained 28% of the variation in distress level.

The association of psychological distress with female gender, early loss, life events and lack of social support is consistent with much previous research on these factors in other populations. The gender association may be partly due to a reluctance to disclose distress among males which is a feature both of Cree culture and the larger North American society (Darnell, 1981). The effect of early loss was observed only for those aged 15–24. This may reflect a recency effect either in memory or impact of events. The negative effect of drinking problems was found particularly for younger females, and for males and females aged 25–44. The protective effects of social support cut across age groups. The higher level of distress among the young and the associations with a higher level of education and less time in the bush are distinctive for this population and require further comment.

The higher levels of distress among Cree youth parallel similar findings on distress with other Canadian aboriginal groups (Kirmayer, 1994; Petawabano et al., 1994). In many communities, youth face a great discrepancy between the world portrayed in the mass media, expectations placed on them by elders and the options open to them locally. There are few wage-earning jobs and many obstacles to pursuing higher education. Cultural transmission from elders has been disrupted, leaving youth without a clear sense of identity and direction to their lives (Wintrob & Sindell, 1972). These problems, which have had devastating effects in some communities, may be mitigated for the Cree by very active signs of cultural revitalization and political empowerment.

The association between spending more time in the bush and reporting less psychological distress was observed in both bivariate and multivariate analyses with the whole sample of respondents. When the sample was divided into age/gender cohorts, this association appeared to be more relevant for males between the ages of either 15 and 24 or 25 and 44. Although female respondents also spent time in the bush (and, in fact, 16% of them were trappers by occupation), going to the bush, particularly for extended periods, is more common among male James Bay Cree. The average length of time spent in the bush by the male respondents was 10.9 weeks versus 8.3 weeks for the females ($p < .001$). Of the 124 persons who reported that they did not spend any time in the bush in the year before the survey, 67% were female and 76% had more than elementary education. Thus, men are more likely to experience whatever beneficial

effects are associated with time in the bush. Also, men's and women's experience in the bush tends to differ in that men are primarily concerned with hunting while women are in charge of preparation of the meat (and other foods) which may be time-consuming and physically challenging.

The income-security program for Cree hunters and trappers is a unique system that was set up to subsidize traditional land use and allow families to continue living on their traditional hunting grounds, as part of the James Bay and Northern Quebec Agreement in 1975. Participants must maintain a long-term pattern of going to the bush and spend a minimum number of days on the land each year. However, the Cree do not go into the bush solely to obtain an income, in terms of furs for trade and meat for subsistence. Bush living is a valued activity in itself that involves the extended family as a whole. The Cree of the James Bay region are noteworthy among northern aboriginal peoples in the degree to which entire families still go to the bush. The school calendar is arranged so that hunting breaks, particularly the spring 'goose break,' are at a time most advantageous for families to get together in hunting camps.[2]

Most Cree agencies shut down during the hunting breaks to allow their employees to spend time in the bush. The Cree sharing ethic means that employees living in the villages obtain bush food, and provide the full-time hunters some of the things needed in the bush that require cash.[3] Full-time employees tend to have the equipment that allows them access to the bush; a number of them spend evenings, weekends and vacation in bush camps, often visiting those of relatives or friends who are income-security recipients. Seasonal or casual laborers also tend to spend time in the bush when there is no work available.

A large part of bush life involves contact with nature, spiritual relations with animals, consumption of valued foods and participation in other traditional activities. Increased time in the bush may confer mental health benefits by increasing family solidarity and social support, reinforcing cultural identity, improving physical health with nutritious bush foods and exercise, or providing respite from the pressures of settlement life. Alternatively, individuals who are less distressed may find it easier (physically, economically and socially) to participate in bush life.

Another possible mental health benefit of time in the bush for those who have a history of abuse problems may be the degree to which access to alcohol and other substances is limited. While it is possible to carry these substances to the bush, or even to manufacture home brew, a different ethic that limits substance use is generally in effect in the bush. Similarly, while living in the bush does not prevent family violence, it does establish a situation in which people are much more aware of the behavior of everyone else in the group; violence may thus be more readily discouraged by social pressures than it is in the villages.

Suprisingly, having had at least some secondary education was significantly associated with more psychological distress in the entire sample. Education may increase expectations for employment that are difficult to meet in the Cree context. Alternatively, those with more education may tend to have more stressful jobs, perhaps because they involve longer working hours, travel away from the family or are less traditional careers. We examined whether being a 'professional' could account for the education/distress relationship, by entering an occupation variable in the final age/gender cohort models containing the education variable. In each case, the education variable retained a similar beta coefficient as in a model not containing the occupation variable, and the occupation variable did not achieve statistical significance. The only age/gender group for whom the occupation factor approached significance was females aged 45–64, where being a professional increased distress level by 6.9 units with a *p*-value of .091. For this group, then, occupation may play a role but it does not explain the association of distress with higher education.

Across each age/gender cohort analyzed with multivariate regression, the education factor appeared to be more relevant for the female groups. It is possible that having a higher education leads to distress due to the additional pressures placed on women to fulfill job/career aspirations and financial responsibilities, at the same time as having children and being in charge of a household. Cree women tend to start families at a young age and even those who work continue to carry the major burden of domestic tasks. This explanation would account for the negative impact of education in women aged 15–44; however, the association between higher education and psychological distress was significant for both males and females in the 45–64 age group, suggesting that factors other than the strain of multiple roles may be important for this group.

The effect of education on distress may also reflect a cohort effect. Men and women 45–64 years of age who had at least some secondary school education likely attended residential schools. In addition to prolonged and often painful separations from their families, they may have suffered systematic devaluation and suppression of their language and culture (Miller, 1996). Recent literature has documented the harsh conditions in many of these schools, including a high prevalence of physical and sexual abuse (Haig-Brown, 1988: Knockwood, 1992; Royal Commission on Aboriginal Peoples, 1996). Exposure to this environment may have long-term effects and may account, in part, for the association between a history of more education and higher levels of emotional distress. Unfortunately, the survey did not include questions about residential school experience so this interpretation remains conjecture.

We found some regional differences in levels of distress but these are difficult to interpret. Living inland (as opposed to in coastal communities)

and in a relatively isolated community (as opposed to a community with access by road) were both significantly associated with distress in the multivariate analysis of the whole sample. Women aged 15–24 in an isolated region reported more distress, which may reflect feelings of entrapment, frustration or boredom related to the lack of year-long road access. For women aged 25–44, distress was more closely related to living in an inland region. All of the villages in the inland region are also 'nonisolated' (that is, accessible by road all year). The proximity of the road to larger non-Native towns with bars could in part contribute to increased stress among women aged 25–44 whose male spouses may access these urban centers for drinking. It is also possible that these differences do not reflect any consistent geographical effect but variations in level of distress in a few communities due to other local social circumstances. Communities differ in their political structure, religious activities and social problems.

This study has important limitations that stem from the design of the original survey. The index of psychological distress provides only an indirect measure of psychiatric disorder in a population (Santé Québec, 1994; Perrault, 1987). The only measure of psychiatric history used in the Santé Québec survey was a small number of questions about problems experienced by each household member which were answered by the household respondent. Other personal and social factors that could have an impact on distress were absent from the survey, such as drinking by parents and other family members, spousal abuse and fragmented caregiver history (i.e. multiple home placements). The measure of distress was not culturally adapted and its sensitivity to the range of expression of distress across gender and age cohorts is unknown (Manson, Shore, & Bloom, 1985; O'Nell, 1996; Timpson et al., 1988). The survey did not examine other traditional pursuits besides time in the bush (e.g. healing practices, dream interpretation) which may also have importance (Prince, 1993; Tanner, 1979; D. E. Young, 1989). The cross-sectional nature of the data should be kept in mind when interpreting the results since both the independent and dependent variables were collected at one point in time. However, the psychological distress measure referred to the past week only and most of the independent factors reflected long-standing or prior characteristics.

These findings have implications for mental health promotion among the Cree of James Bay. The differences in factors contributing to distress across age and gender suggest that an approach targeted to specific age/gender cohorts is needed. Further qualitative research may clarify the observed association between higher education and more distress for younger females (15–24 and 25–44 years old) and identify the specific challenges faced by these women. Interviews with women from the two age-groups represented, preferably linked to the development of mental health promotion strategies, should address what level of stress they are experiencing, how they are

dealing with their everyday lives, and whether they have developed any stress reduction tactics of their own. Qualitative research may also clarify the role of time in the bush in modulating psychological distress.

Conventional mental health promotion programs, such as those that serve to help people overcome addictions, are needed in the James Bay region (Kirmayer, Boothroyd, Laliberté, & Laronde Simpson, 1999; Mrazek & Haggerty, 1994; Tudor, 1996). Programs that make living in the bush more accessible appear to have been beneficial for the mental health of some individuals. The income-security program has likely been important in reducing the level of psychological distress among older adults, especially men, but living in the bush may not be effective for everyone. There is a wide range of different lifestyles and attitudes toward waged work, bush life and education in the communities. Accordingly, it is important that mental health promotion includes programs that provide a range of options for making life in the villages more satisfactory, or for allowing work or pursuit of educational opportunities outside the villages. Innovative programs could be developed for specific age and gender groups using qualitative research methods.

Acknowledgments

This work was supported by grants from the Conseil québécois de la recherche sociale and the Fonds de la recherche en santé du Québec. We thank Santé Québec and the Cree Board of Health and Social Services of James Bay for their collaboration. We also thank Robert Imrie, Jill Torrie, and especially Caroline Oblin for valuable feedback on this article.

Notes

1. The reason for this change was unclear and would seem to shift the meaning of the item from predominantly sadness or distress to irritability and social withdrawal (cp. O'Nell, 1996).
2. During the school year children stay in the community, often living with relatives while their parents are in the bush.
3. Depending on the community of residence and family ties, a person's traditional hunting grounds may be a considerable distance away from his or her home. The costs of transportation and hunting/camping equipment can limit some people's access to the bush.

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