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Post-Traumatic Stress Disorder in Canada

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Post-traumatic stress disorder (PTSD) has become a global health issue, with prevalence rates ranging from 1.3% to 37.4%. As there is little current data on PTSD in Canada, an epidemiological study was conducted examining PTSD and related comorbid conditions. Modified versions of the Composite International Diagnostic Interview (CIDI) PTSD module, the depression, alcohol and substance abuse sections of the Mini International Neuropsychiatric Interview (MINI), as well as portions of the Childhood Trauma Questionnaire (CTQ) were combined, and administered via telephone interview in English or French. Random digit dialing was used to obtain a nationally representative sample of 2991, aged 18 years and above from across Canada. The prevalence rate of lifetime PTSD in Canada was estimated to be 9.2%, with a rate of current (1-month) PTSD of 2.4%. Traumatic exposure to at least one event sufficient to cause PTSD was reported by 76.1% of respondents. The most common forms of trauma resulting in PTSD included unexpected death of a loved one, sexual assault, and seeing someone badly injured or killed. In respondents meeting criteria for PTSD, the symptoms were chronic in nature, and associated with significant impairment and high rates of comorbidity. PTSD is a common psychiatric disorder in Canada. The results are surprising, given the comparably low rates of violent crime, a small military and few natural disasters. Potential implications of these findings are discussed.

Introduction

Post-traumatic stress disorder (PTSD) is a chronic, often debilitating condition, which is the direct result of a traumatic event. According to the Diagnostic and Statistical Manual, Fourth Edition, text revision (DSM-IV-TR) [1], the traumatic event may be experienced, witnessed, or learned about (if the event was experienced by a close associate or family member) and is characterized by intrusive or re-experiencing symptoms, persistent avoidance of stimuli associated with the stimuli and numbing of general responsiveness, and persistent symptoms of hyperarousal. These symptoms last more than 1 month following the event and result in significant functional impairment. PTSD has a high rate of comorbidity for other psychiatric disorders, particularly major depressive disorder (MDD), as well as alcohol and substance abuse and dependence [2–7]. Indeed, this disorder and its comorbid conditions impacts adversely on the emotional, physical, occupational, and social functioning of afflicted individuals and presents a significant cost to society [8].

Although it is unclear how well risk factors predict the development of PTSD, gender seems to have a strong association [4–6,9–13], with women being twice as likely than men to develop the disorder [14]. Previous exposure to trauma [15], particularly those of assaultive violence, has also been identified as a risk [14], with peak exposure to all traumatic classes typically occurring between 16 and 20 years of age [9,10,16]. Other reported pretrauma risk factors include young age, a history of childhood maltreatment, the type and severity of the trauma, individual personality and psychiatric history, family psychiatric history, race, and educational level [3,10,14–18]. Rape appears to be the form of trauma most likely to result in PTSD for both men and women, followed by physical assault and combat [3–5,9,10,19]. The sudden, unexpected

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death of a loved one also appears to be associated with the development of PTSD in at least one report which noted that this type of trauma accounted for a moderate probability of developing PTSD [9].

Until recently, epidemiological reports of PTSD were based on studies of Vietnam veterans, or specific populations exposed to conflict or disasters [14]. For the purposes of this article, we limited our review to studies examining rates in the general population. The bulk of epidemiological investigations of PTSD have been conducted in the United States [2–4,7,9,19]; however, data from Canada [11], Australia [6,20], Germany [5], Switzerland [21], and Sweden [22] are present in the literature. Exposure to trauma in the community appears to be a relatively common occurrence, with rates ranging from 25.2% [5] to 81.3% [11] in men; 17.7% [5] to 74.2% [11] in women, and 39.1% [3] to 89.6% [9] for men and women combined. A smaller proportion of these individuals go on to develop PTSD; for example, the National Comorbidity Survey (NCS) reported that 7.8% [4] of Americans had lifetime PTSD (this figure was revised to 6.8 % in the NCS-Replication study using DSM-IV criteria) [23]. US rates of 1.0% [7] to 9.2% [9] (lifetime) have also been reported. In one of the two studies examining rates of PTSD in the general Canadian population, Stein et al. [11] evaluated the current (1-month) prevalence rates of full and partial DSM-IV [1] PTSD in a community sample of 1002 individuals in Winnipeg, Manitoba. Full PTSD was found in 1.2% in men and 2.7% in women. A second study of 3062 Ontario women, evaluated PTSD on a single question, and a reported a rate of 10.7 % [24].

Study Objective

Given the dearth of Canadian epidemiological data on PTSD, researchers have been forced to rely on US prevalence reports. Our countries share a common border and a similar cultural diversity, yet, compared with the U.S., Canada has a much smaller military, as well as lower rates of violent crime [25] and natural disasters [26]. The authors, therefore hypothesized that Canadian data would reflect both lower prevalence rates of exposure to trauma and of PTSD. A nationwide telephone survey was conducted to determine the prevalence of this disorder and three of its comorbid conditions in Canada

Method

Sample

Study participants were part of a nationally representative sample of 2991 individuals living in Canada in July and August 2002 who were 18 years of age and older. As 97% of Canadians owned a telephone in 2001[27], the sample was obtained by a random digit dialing (RDD) method, using ASDE software [28]. ASDE Survey Sampler is a geographically stratified, general phone population, random sampling program, based on the Mitofsky–Waksberg method, widely accepted for use in telephone surveys [29]. Geographical strata in the sample design were Canada's 10 provinces and three territories, which were sampled proportionately by population. Interviewers made up to seven attempts to contact a household at varying times over a 45-day period. Telephone interviews were conducted in French and English. Participant eligibility was determined by the person in the household over the age of 18 years, who had the most recent birthday (a technique to reduce over-sampling of females [29]). Qualifying respondents gave informed, verbal consent after being given an explanation of the study's purpose and background. In total, 11,052 households were contacted, and 4776 (43%) were screened for age eligibility. Within households where eligibility was not screened, nonresponse rationale included language barrier of respondent, hang-ups, or early refusal to participate (before the purpose of the study was explained). Of those households screened for eligibility, 4413 (92%) contained an eligible respondent, and 3006 completed the survey. The cooperation rate was 27.2% for all contacted households, and was 68.1% within eligible households. Although 3006 individuals completed the survey, 15 individuals were removed from analyses due to missed responses, leaving a final sample size of 2991.

To adjust for under-sampling of males, and to bring the study sample in line with Canadian population estimates, *post hoc* stratification weights were applied using the distribution of sex and age (eight categories) found in the 2001 Canada Census. The sociodemographic characteristics of the sample, as compared to 2001 Census data, are detailed in Table 1.

Interviewer Selection

A survey organization, having extensive experience with population-based health surveys executed the PTSD survey. All interviewers were female and carefully selected for their ability to handle sensitive subject matter over the telephone. Each interviewer completed approximately 8 h of training, which included instruction, practice, and role-playing exercises. A manual for the survey instrument was provided to each interviewer.

Diagnostic Instrument

A number of existing diagnostic instruments were combined and slightly modified to produce an instrument

Table 1 Characteristics of the sample (n = 2991)

Respondent characteristics	n (unweighted %)	weighted %	2001 Census Canada %[a]
Sex			
Male	1181 (39.5)	48.5	48.3
Female	1811 (60.5)	51.5	51.7
Age in years			
18–29	629 (21.0)	20.2	20.3
30–39	643 (21.5)	20.1	20.1
40–49	634 (21.2)	20.9	21.3
50–64	640 (21.4)	21.8	21.5
65+	445 (14.9)	17.0	16.9
Race[b]			
White	2638 (88.2)	87.8	87.3
Black	52 (1.7)	1.7	2.0
Aboriginal	57 (1.9)	1.9	3.3
Latin American	6 (0.2)	0.2	0.7
Asian	103 (3.4)	3.5	8.6
Other	135 (4.5)	4.9	1.5
Marital status[b]			
Legally married/common law	1663 (55.6)	55.9	59.7
Separated/divorced/widowed	604 (20.2)	20.2	13.3
Single/never married	724 (24.2)	23.9	26.9
Education[c]			
Some high school or less	479 (16.0)	16.6	31.3
High school graduate	679 (22.7)	22.6	24.9
Some college-technical-university	592 (19.8)	19.8	10.9
College graduate	512 (17.1)	16.6	15.0
University graduate	729 (24.4)	24.4	17.9
Family income (Can. Dollars)[b]			
<$20,000	396 (16.2)	15.7	11.0
$20,000–39,000	653 (26.7)	26.6	22.2
$40,000–74,000	826 (33.8)	34.1	39.1[d]
$75,000+	570 (23.3)	23.6	27.7[e]
Missing household income	546		
Employed last week[b]			
Employed	1764 (59.0)	58.8	61.5
Unemployed	1227 (41.0)	41.2	38.5
Residence[c]			
Urban	1657 (69.6)	69.5	79.7
Small urban/rural	723 (30.4)	30.5	20.3
Location			
Atlantic Canada	264 (8.8)	8.9	7.7
Western Canada	881 (29.5)	29.6	29.5
Ontario	1126 (37.6)	37.5	37.8
Quebec	720 (24.1)	24.0	24.7

[a]Please refer to Refs 47–55 for 2001 Census Canada % Data (Column).
[b]2001 Census population 15 years and older.
[c]2001 Census all age groups.
[d]2001 Census: $40,000–$79,999.
[e]2001 Census: > $80,000.

designed to measure lifetime exposure to trauma, DSM-IV [1] lifetime and current (1-month) PTSD, DSM-IV [1] major depressive disorder, DSM-IV [1] alcohol and substance abuse, and dependence and exposure to childhood maltreatment.

PTSD was evaluated using the Canadian Community Health Survey [30] (CCHS) 1.2 module, which screens for DSM-IV [1] PTSD, and is very closely based on the World Mental Health (WMH) 2000 surveys [31]. The WMH 2000 surveys are revised versions of the

Table 2 Qualifying traumatic events

	Type of event
1	Have you ever participated in combat, either as a member of a military, or as a member of an organized nonmilitary group?
2	Have you ever serviced as a peacekeeper or relief worker in a war zone or in a place where there was ongoing terror of people because of political, ethnic, religious, or other conflicts?
3	Were you ever a refugee—that is, did you ever flee from your own home to a foreign country or place to escape danger or persecution?
4	Were you ever kidnapped or held captive?
5	Were you ever exposed to a toxic chemical or substance that could cause you serious harm?
6	Were you ever involved in a life-threatening motor vehicle accident?
7	Were you ever involved in a very serious work-related accident, where you could have been killed?
8	Were you ever involved in a major natural disaster, like a devastating flood, hurricane, earthquake, or fire?
9	Were you ever badly beaten by anyone, including your parents or the people who raised you, your spouse or partner, or anyone else?
10	Were you ever mugged, held up, or threatened with a weapon?
11	The next two questions are about sexual assault. We define sexual assault as anyone forcing you or attempting to force you into any unwanted sexual activity, by threatening you, holding you down or hurting you in some way. Has this ever happened to you?
12	Has anyone every touched you against your will in any sexual way? By this I mean unwanted touching or grabbing, kissing, or fondling.
13	Has someone very close to you ever died unexpectedly; for example, they were killed in an accident, murdered, committed suicide, or had a fatal heart attack at a young age?
14	Has anyone very close to you ever had an extremely traumatic experience, like being kidnapped, tortured, or sexually assaulted?
15	When you were a child, did you ever witness serious physical fights at home, like your father beating up your mother?
16	Have you ever personally seen someone being badly injured or killed, or unexpectedly seen a dead body?
17	Have you ever personally seen atrocities or massacres such as mutilated bodies or mass killings?
18	Other than what you reported, have you ever experienced any other life-threatening event?
	Record other event here: _____
	Total of lifetime events (Count of total items marked in column)

Items were read as above, in this order.

Composite International Diagnostic Interview (CIDI) [32]—a validated instrument designed to be administered by experienced interviewers without clinical training [9,33], and used in many previous epidemiological studies of PTSD [5–7,10,26]. Additional questions were added to the CCHS module to elicit symptoms of current PTSD. To evaluate lifetime exposure to trauma, respondents were read a list of 18 traumatic events and asked to report any of those experiences (Table 2). Following the list, respondents were asked if, following any of these events, they had experienced symptoms of re-experiencing, avoidance/numbing or hyperarousal, and if these symptoms had occurred at least once per week for 1 month or longer. If responses were negative, respondents did not complete the PTSD section and skipped to the History of Childhood Maltreatment section at the end of the survey. Respondents who denied experiencing a traumatic event were not included in the prevalence calculations of PTSD. If responses were positive, respondents were then asked to select their "worst" event and to complete the PTSD section based on this event.

Major depression, alcohol and substance abuse modules were based on the Mini International Neuropsychiatric Interview (MINI) [34], a validated instrument which has also been used in telephone interviews [35]. Screening for all comorbid diagnoses were based on the time period that followed the traumatic event. Additional probes were included in each section to determine both past and current symptoms of MDD, alcohol and substance abuse and dependence, as well as information concerning substance consumption (frequency, duration, and amount).

In order to assess exposure to childhood maltreatment, excerpts from the Childhood Trauma Questionnaire (CTQ) [36] were asked of all respondents at the end of the survey. The CTQ is a validated instrument designed to screen for childhood physical abuse and neglect, emotional abuse and neglect, and sexual abuse [37]. We did not use the CTQ in its entirety, but included questions pertaining to physical and sexual abuse, one question concerning emotional abuse (11 of the 28 CTQ screeners), and added probes to determine frequency of abuse.

Respondents who completed the PTSD section of the survey were asked about social supports available to them before the event. Help-seeking behavior following the event was then investigated, including the types of

providers consulted, the types of treatments received, the frequency and duration of treatments, and a subjective evaluation of the helpfulness of treatments.

Both full and partial PTSDs were evaluated. Full PTSD was defined according to DSM-IV [1] criteria, including duration (criterion E) and impairment/distress (criterion F). Partial PTSD was defined as meeting full DSM-IV [1] criteria for duration and impairment/distress, and having at least one symptom in each of the following symptom clusters: re-experiencing (criterion B), avoidance or numbing (criterion C), and hyperarousal (criterion D) without meeting full criteria.

Data Analysis

Most of the results are presented as percent prevalence estimates and simple relative odds, accompanied by standard errors or 95% confidence intervals. Logistic regression analyses using SPSS-PC 11.5 (SPSS Inc., Chicago, IL, USA) was used to model lifetime PTSD as a function of selected sociodemographic characteristics.

Results

Exposure to Trauma

In the total population, 75.9% reported lifetime exposure to one or more traumatic event (73.4% in women and 78.5% in men). The majority of these individuals reported exposure to multiple events with a mean of 2.31 (SD = 2.33). Men reported a significantly higher mean number of traumatic exposures (2.48 events; SD = 2.43), compared to women (2.15 events; SD = 2.23) ($P < 0.001$, t = 3.87).

The types of traumas most commonly experienced by Canadians are detailed in Table 3.

Prevalence of PTSD

The prevalence rates of PTSD obtained from this sample are presented in Table 4. Within each group, the rates of the full and partial disorder are presented for the total population and are further compared by gender. The rate of lifetime PTSD (PTSD-L) was found to be 9.2% and the rate of current PTSD was 2.4%. Significantly more women than men met criteria for both full and partial PTSD in the current and in the lifetime PTSD groups.

Traumatic Events Associated with PTSD

Six hundred forty-five respondents experienced symptoms of PTSD following exposure to a traumatic event and were subsequently screened for a diagnosis of PTSD and selected comorbid conditions. The remainder of the 2991 respondents who did not report any residual

Table 3 Type of traumatic exposure by gender (n = 2991, weighted analysis)

Type of exposure	Men (%)	Women (%)	Total (%)
Assaultive violence			
Sexual assault[a]	3.3	19.1	11.4
Sexual molestation[a]	10.2	32.8	21.9
Being badly beaten	8.6	9.7	9.2
Mugged/threatened with a weapon[a]	21.1	11.1	16.0
Kidnapped	1.2	1.6	1.4
Participated in combat[a]	7.9	0.8	4.3
Other injury or shock			
Witnessed someone killed, dead or badly injured[a]	41.0	23.5	32.0
Witnessed physical domestic violence as a child	7.9	10.5	9.3
Life threatening motor vehicle accident[a]	22.9	13.1	17.8
Witnessed atrocities[a]	4.8	2.1	3.4
Refugee	2.5	1.8	2.1
Involved in serious work-related accident[a]	13.6	2.5	7.9
Involved in major natural disaster	17.8	13.6	15.6
Exposed to toxic chemicals[a]	15.4	5.1	10.1
Peacekeeper/relief worker[a]	3.2	0.8	1.9
Other trauma[a]	10.5	6.9	8.6
Learning about others			
Trauma experienced by someone else	15.7	17.8	16.8
Sudden unexpected death	39.9	42.2	41.1

[a]$P < 0.001$.

Table 4 Prevalence of PTSD by gender (n = 2991, weighted analysis)

Type of PTSD	Men (%)	Women (%)	Total (%)	Women vs. men, O/R	95% CI
Lifetime PTSD					
Full	5.3	12.8	9.2	1.452[a]	1.337–1.577
Partial	1.5	2.9	2.2	1.307[b]	1.102–1.551
Current PTSD					
Full	1.3	3.3	2.4	1.429[a]	1.236–1.652
Partial	1.8	5.0	3.5	1.472[a]	1.130–1.654

[a]$P < 0.001$, [b]$P < 0.01$.

symptoms following exposure to a traumatic event skipped to the end of the survey. Among respondents screened for full PTSD (n = 645), those who met criteria for lifetime PTSD were exposed to a mean number of 4.91 traumas (SD = 2.47, $P < 0.001$), compared with those who did not meet criteria for PTSD, who reported exposure to a mean of 3.9 traumas (SD = 2.35, $P < 0.001$).

The frequencies of traumatic events leading to PTSD symptoms are listed in Table 5.

Duration of Symptoms

Most individuals in our sample (68.5%) reported full symptoms of PTSD lasting more than 1 year: 59.7% of the men and 71.9% of the women.

Help-Seeking Behavior

More than half of those who met criteria for lifetime PTSD sought some form of help for their symptoms (64.2%). Mental health professionals (psychiatrists and psychologists) were consulted most frequently (76.1 %), followed by para-professionals (social workers, counselors, nurses) (64.8%), family physicians (55.9%), and other sources of treatment, including clergy and self-help groups (55.1%). Most individuals with PTSD (91.5%) reported receiving counseling or therapy, including

Table 5 Traumatic events associated with lifetime PTSD (n = 645, weighted analysis)

Traumatic Event	Men (%) Lifetime PTSD	Women (%) Lifetime PTSD	Total LifetimePTSD	Total No PTSD
Assaultive violence				
Sexual assault	3.9	25.8[a]	20.0[c]	9.3
Sexual molestation	2.6	5.6	5.1	3.6
Being badly beaten	7.8	13.2[a]	11.7[c]	3.3
Mugged/threatened with a weapon	2.6	3.5	3.3	3.9
Kidnapped	7.9	0.5	2.6	0.9
Participated in combat	1.3[b]	0	0.4	3.3
Total assaultive violence	27.6	49.0[a]	43.1[c]	24.0
Other injury or shock				
Witnessed someone killed, dead or badly injured	16.9	5.6	8.7[d]	14.9
Witnessed physical domestic violence as a child	2.6	6.6	5.5	5.1
Life threatening motor vehicle accident	7.8	2.5	4.0	7.8
Witnessed atrocities	6.5	1.5	2.6	1.5
Refugee	0	1.0	0.7	0.6
Involved in serious work-related accident	1.3	0	0.4	4.2
Involved in major natural disaster	0	1.0	0.7	4.2
Exposed to toxic chemicals	0	0[b]	0	0.6
Peacekeeper/relief worker	0	0[b]	0	0.3
Other trauma	0	0	0[d]	5.7
Total other injury or shock	35.1	17.7[a]	22.5[c]	45.1
Learning about Others				
Trauma experienced by someone else	5.2	4.1	4.4	3.0
Sudden unexpected death	32.9	29.3	30.3	27.8
Total learning about others	37.7	33.3	34.5	31.0

[a]$P < 0.001$, [b]$P < 0.01$, [a*]$P < 0.05$: Differences in the frequencies between men and women with the strength of association between a trauma and the subsequent development of PTSD tested using the Mantel Haenszel test of conditional dependence.
[c]$P < 0.001$, [d]$P < 0.05$: Pearson chi-square tests of strength of association between a trauma and the subsequent development of PTSD for total 645 persons who experienced symptoms secondary to trauma exposure.
Individual percents do not always add up to marginal totals because of weighting.

Table 6 Lifetime PTSD and comorbid disorders (n = 645, weighted analysis)

	Men			Women			Total		
	With PTSD (%)	No PTSD (%)	O/R (95% CI)	With PTSD (%)	No PTSD (%)	O/R (95%CI) (95%CI)	With PTSD (%)	No PTSD (%)	OR (95%CI) (95%CI)
MDD	63.0	22.6	5.8 (3.13–10.93)[a]	78.1	36.6	6.16 (3.94–9.64)[a]	74.0	30.9	6.36 (4.44–9.11)[c]
Alcohol abuse/dependence	44.7	25.0	2.42 (1.34–4.01)[b]	21.3	12.1	1.97 (1.14–3.39)[b]	27.8	14.4	1.83 (1.25–2.71)[c]
Substance abuse/dependence	41.3	10.3	6.14 (2.99–12.60)[a]	19.3	5.1	4.49 (2.17–9.30)[a]	25.5	7.2	4.43 (2.69–7.28)[c]

[a]$P < 0.001$, [b]$P < 0.01$: Men versus women and comorbidity for those with and without lifetime PTSD using Pearson chi-square and risk estimates.
[c]$P < 0.001$: Men and women combined, with/without PTSD and with comorbidity using Pearson chi-square and risk elements.

cognitive behavioral therapy and 56.9 % received some form of medication.

Comorbidity

Comorbidity was assessed based on the period of time following the traumatic event. The post-trauma DSM-IV [1] prevalence of the three comorbid disorders are reported in Table 6.

Childhood Maltreatment

Compared to respondents with no PTSD diagnosis, those who met criteria for PTSD-L were significantly more likely to have a history of childhood maltreatment. Sixty-one percent of the sample reported a history of childhood physical or sexual abuse ($x^2 = 73.3$, df = 1, $P \leq 0.001$). When examined separately, 51.4% reported a history of childhood physical abuse, and 34.8% reported childhood sexual abuse.

Predictors

The association between PTSD and selected demographic variables were tested using logistic regression (Table 7). Being divorced, separated, or widowed produced the strongest association with PTSD (OR = 3.261). Estimates of PTSD were higher for those living in rural areas, Western Canada, and Ontario as well as among those who were single (never married). The risk for PTSD was significantly lower among males.

Table 7 Logistic regression of lifetime PTSD on the socio-demographic characteristics of respondents (n = 2991, weighted analysis)

Respondent characteristics	Relative odds	95% CI
Sex		
Female	1.0	
Male	0.369[a]	0.276–0.493
Age in years	0.969[a]	0.959–0.979
Race		
White	1.0	
Other	0.832	0.544–1.271
Marital status		
Legally married/common law (ref)	1.0	
Separated/divorced/widowed	3.261[a]	2.293–4.637
Single/never married	1.488[b]	1.043–2.124
Education		
Some high school or less	1.0	
High school graduate	0.905	0.580–1.414
Some college-technical-university	1.074	0.687–1.680
College graduate	0.932	0.577–1.505
University graduate	0.779	0.483–1.257
Household income (Can. Dollars)		
<$20,000	1.199	0.772–1.863
$20,000–39,000	1.249	0.868–1.797
$40,000–74,000	1.0	
$75,000+	1.096	0.734–1.637
Employment		
Worked last week	1.0	
Did not work	0.918	0.679–1.241
Residence		
Urban	1.0	
Rural	1.44[b]	1.035–2.015
Region		
Atlantic Canada	1.0	
Western Canada	1.956[b]	1.131–3.384
Ontario	1.727[b]	0.999–2.985
Quebec	1.025	0.570–1.844

[a]$P < 0.001$, [b]$P < 0.05$.

Discussion

Exposure to Trauma

Most individuals in Canada (76.1 %) have been exposed to at least one traumatic event in their lifetime. Our rate of trauma exposure was consistent with previous Canadian data (81.3% of men and 74.2% or women) [11], but was somewhat less than that found by Breslau et al. [9] (89.6%) in Detroit and significantly less than Frans et al. [22] found in Sweden who reported a rate of 28% in their population based study. In the NCS, 60.7% of men and

51.2% of women reported exposure to at least one traumatic event, compared to 78.6% of men and 73.8% of women in our Canadian sample [4]. The NCS employed the more restrictive DSM-III-R PTSD [38] criteria, and it is likely that the higher rates of traumatic exposure in our study resulted from the use of a broader list of qualifying events, as defined by DSM-IV [1,39,40]. Although there was little change in the criteria for PTSD from DSM-III-R to DSM-IV, the definition of "stressor" was expanded to include those traumas which are indirectly experienced (learned about). This, coupled with the added subjective component in DSM-IV (where the individual's subjective response involved intense fear, helplessness, and horror) have lead to increased cases of PTSD compared to previous versions [39]. The majority of individuals in our sample reported exposure to multiple traumatic events, also consistent with other studies [4,9,11]. The unexpected death of a loved one was the most common form of trauma reported by both men and women in both our study and in the 1996 Detroit Area Survey [9] and yielded relatively high rates of PTSD, 30% in our sample and 31.1% in the Detroit Area Survey.

The rate of exposure to acts of sexual molestation in Canadian women (32.8%) was more than double the rate of 14.3 %, previously reported by Resnick et al. [19], and by Kessler et al. in the NCS (12.3%) [4]. In Canadian men, the rate of witnessing some one killed, dead, or badly injured yielded the highest rate of exposure (40.1%), similar to that found in the NCS (35.6%) [4]. Consistent with both the United States [4,9,19] and Swedish data [22], the types of traumas most likely to result in PTSD in our study were those of assaultive violence, in particular sexual assault.

Prevalence

Comparison of our epidemiological data with previous reports is complicated, due to variations in instrumentation, sampling, sample size and characteristics, as well as the time-frame for symptom duration (i.e., 1 month, 1 year, or lifetime). Also, the use of the respondents' personally selected "worst event" versus a randomly selected event, differences in the classification of psychiatric disorders (i.e., DSM-III-R vs. DSM-IV) [1,38], and the number of allowable traumatic events differ considerably between studies [39]. In this study, respondents selected their worst event upon which to base the interview. The Detroit Area Survey employed similar methodology to this study but used a randomly selected event to determine conditional risk of PTSD. Had they used the worst event method, the rate of PTSD in this study would have been 13.6% [39] putting the Detroit rate higher than our Canadian rate as initially hypothesized. Nevertheless, our rate of current PTSD of 2.4%, 1.3% for men and 3.4% for women, was similar to that found in two other small Canadian epidemiological samples. Stein et al. determined a 1-month rate of PTSD of 1.2% in men and 2.7% in women in their community sample [11]. Boddam et al. recently reported on a sample of the Canadian military, and found a 12-month prevalence rate of 2.8% [41]. The NCS replication study indicated rates of current PTSD to be slightly higher in the United States at 3.5% [42]. Surprisingly, the rate of lifetime PTSD in this Canadian sample was more comparable to the rates found in the NCS and Detroit area survey [4,9] than rates found in other countries [6,22] suggesting that Canada is quite similar to the United States in terms of both exposure to trauma and in the subsequent development of PTSD (43.1%, df = 1, $P < 0.001$).

Risk Factors

Many investigations have evaluated risk factors associated with the development of PTSD including pretrauma, peritrauma, and post-trauma factors. Evidence has consistently indicated that certain pretrauma factors present much stronger risks. These risks include being female, having a prior psychiatric disorder (including neuroticism), having a family psychiatric history, being abused as a child, or an early age of trauma occurrence [4,5,16,43,44]. In our sample, being separated, divorced, or widowed was also found to be a significant risk. Severe traumatic events such as a threat to life or ones body, an event resulting in severe injury, events which were intended to harm the victim, those involving horrific images, witnessing or learning of violence to loved ones, those causing death or severe harm to another, or traumas resulting in a severe loss, seem to present an increased risk for developing PTSD [16,45,46]. Evidence concerning post-trauma factors is also emerging and elements such as individual psychological response, and environmental conditions after the trauma may be very influential in the development of this disorder [43].

In a meta-analysis of 77 studies of PTSD 14 risk factors were examined [18]. In both military and civilian populations, pretrauma factors such as childhood maltreatment, low socio-economic status, psychiatric history, and family psychiatric history revealed only modest predictive ability. The authors found that the factors related to the trauma itself as well as post-trauma elements emerged as much stronger predictors of PTSD than did pretrauma characteristics. In particular, the severity of the trauma, lack of social supports, and the presence of additional life stress demonstrated the most significant risks [18].

The rate of PTSD in Canada should not then be surprising as most Canadians are exposed to trauma, including

severe trauma. Given that the most influential risk factors for developing PTSD appear commonly in the Canadian population, it would then be reasonable to expect that Canadians would develop PTSD with as much frequency as any other Western society when exposed to trauma.

Limitations

There are several methodological limitations in our study. It has been argued that the use of the respondent's "worst" event may result in overestimation of the conditional risk for PTSD [9,39] in those respondents who reported exposure to one or more traumatic events. This "worst" event method has however been deemed effective in the identification of individuals with PTSD and determining an overall prevalence rate [39], which was the primary objective of this study.

In putting together the instruments used in our survey, we attempted to set limits on the amount of information collected, to avoid undue burden to telephone respondents. Unfortunately, we were unable to obtain potentially useful information such as a more detailed psychiatric history, a family psychiatric history, and additional details regarding childhood trauma.

Although our sample was comparable to 2001 Canadian census reports in terms of gender, age, racial background, and income, the final sample was under-representative in terms of urban habitation and for those with less a high school education. There was some over-representation in our sample for single/divorced/widowed individuals, rural habitation, and for some college as well as university graduates.

Conclusion

A large portion of the Canadian population has been exposed to trauma in their lifetime, making it a relatively common occurrence. We suspect that most of these people will develop some symptoms of PTSD in the period of time immediately following the event; however, in the majority of people, these symptoms will likely resolve [45]. There is a subgroup of Canadian individuals (approximately 10%) who appear to be particularly vulnerable and develop full-syndromal PTSD. This disorder seems to have significant morbidity and impairment in social and occupational functioning and, along with its associated sequelae, is quite chronic in a large proportion of affected individuals. It is therefore paramount for Canadian primary care and mental health workers, as well as other front-line individuals, to become better equipped in recognizing and treating PTSD. Public Education initiatives promoting awareness of the effects of exposure to trauma and the development of PTSD should be incorporated into Public Health directives. In addition, the early identification of pre and post-trauma risk factors may influence the course and development of this disorder, and its comorbid conditions, and decrease the societal burden.

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Conflict of Interest

The authors have no conflict of interest.

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