



A Portrait of Mental Health Services Utilization and Perceived Barriers to Care in Men and Women Evacuated During the 2016 Fort McMurray Wildfires

Émilie Binet¹ · Marie-Christine Ouellet¹ · Jessica Lebel¹ · Vera Békés² · Charles M. Morin¹ · Nicolas Bergeron³ · Tavis Campbell⁴ · Sunita Ghosh⁵ · Stéphane Bouchard⁶ · Stéphane Guay³ · Frank P. MacMaster⁵ · Geneviève Belleville¹

Accepted: 4 February 2021 / Published online: 28 February 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC part of Springer Nature 2021

Abstract

This study examines the influence of gender on mental health services utilization and on perceived barriers to treatment one year after the 2016 Fort McMurray wildfires. Data was collected through a phone survey from May to July 2017 ($N = 1510$). Participants were English-speaking evacuees aged 18 and older. Mental health services utilization and barriers to mental health care were assessed with the *Perceived Need for Care questionnaire*. Probable diagnoses of posttraumatic stress disorder, depression and insomnia were assessed with validated self-report questionnaires. Multiple logistic regressions confirmed that gender was a significant predictor of services utilization, after controlling for associated sociodemographic variables and presence of probable diagnoses. Women were respectively 1.50, 1.55 and 1.86 times more likely than men to receive information, medication and psychological help. Self-reliance was the most frequently reported reason for not receiving help, and motivational barriers, such as pessimism and stigma, were reported in a higher proportion than structural barriers, including nonresponse and finance. No significant gender differences were found in the types of perceived barriers to services. Among the Fort McMurray fire evacuees, mental health services utilization was similar to other studies on natural disaster victims, and higher in women than in men. Efforts to increase services utilization in natural disaster victims should focus on motivational barriers and offering treatments fostering people's autonomy, such as online treatments.

Keywords Natural disaster · Mental health services utilization · Posttraumatic stress disorder · Depression · Insomnia · Gender

Introduction

In 2016, the residents of the town of Fort McMurray in Alberta, Canada suffered a major wildfire, which turned out to be the costliest natural disaster in the history of Canada (Insurance Bureau of Canada 2017). On May 3rd, more than 80,000 residents were evacuated, and more than 2400 buildings were destroyed (The Canadian Press 2017). Studies have shown an increased risk for natural disaster victims to develop psychological difficulties such as posttraumatic stress disorder (PTSD), depression, or insomnia (Laugharne et al. 2011). Recent studies have shown one-month prevalence rates of likely PTSD and major depressive disorder of respectively 12.8% and 14.8% six months after the Fort McMurray fires (Agyapong et al. 2018, 2019).

Despite the existence of effective treatments, only a minority of disaster victims receive mental health services.

✉ Geneviève Belleville
genevieve.belleville@psy.ulaval.ca

¹ School of Psychology, Université Laval, Québec, QC, Canada

² Ferkauf Graduate School of Psychology, Yeshiva University, New York City, NY, USA

³ Department of Psychiatry and Addiction, Université de Montréal, Montréal, QC, Canada

⁴ Department of Psychology, University of Calgary, Calgary, AB, Canada

⁵ Alberta Health Services, Edmonton, AB, Canada

⁶ Department of Psychoeducation and Psychology, Université du Québec en Outaouais, Gatineau, QC, Canada

One study has shown that about one third of individuals with a mood or anxiety disorder following Hurricane Katrina had used any mental health services in the eight months following the disaster (Wang et al. 2007b). Another study of the aftermath of September 11, 2001 terrorist attacks in the United States indicated that only 36% of participants with a probable diagnosis of PTSD or depression had sought help from a mental health professional in the six months following the event, despite a proportion of 70% of those with probable PTSD diagnosis reporting a decrease in their functioning (Stuber et al. 2006).

Many studies have shown that gender differences are present in help-seeking behavior, in attitudes related to psychological treatments, and in perceived barriers to obtaining treatment. Women suffering from psychological difficulties are more likely to seek help than men with the same difficulties (Kessler et al. 1981; Mackenzie et al. 2006; Parslow and Jorm, 2000; Roberts et al. 2011). Other personal characteristics linked to a decreased mental health services utilization include age (older or younger depending on different studies), level of education (lower or higher depending on studies), being separated, being part of an ethnic minority and exposure to more disaster-related stressors, such as presence of damage to the home (Fleury et al. 2016; Lowe et al. 2016; Mackenzie et al. 2006; Parslow and Jorm, 2000; Roberts et al. 2011).

Several authors have studied barriers to mental health treatment in those with psychological diagnoses. A Canadian study showed that the most prevalent barriers to obtaining mental health care in individuals suffering from mood disorder, anxiety disorders or substance dependence were a preference to self manage (28.4%), a fear of asking for help (18.5%), not getting around to it (18.1%) and not knowing how to get help (17.5%) (Slaunwhite 2015). In a study of individuals with PTSD in the United States, main barriers to treatment were not being sure where to get help (39.5%), the belief that one can handle it on its own (28.7%) and not being able to afford treatment (28.3%) (Koenen et al. 2003). It is crucial to understand these barriers, as disaster victims who do not receive professional help are at risk of worsened symptoms, comorbid psychological problems such as an alcohol or drug use disorder, decrease in quality of life and suicide attempts (Kessler 2000; Kessler et al. 2008; Pietrzak et al. 2011).

Some studies have noted gender differences in the types of barriers reported to mental health service utilization. One study revealed that a greater proportion of men reported barriers related to acceptability of services (i.e. barriers related to their perception of psychological problems and to the usefulness of treatment) such as a preference to manage their difficulties by themselves and a fear of asking for help (Slaunwhite 2015). Women were more likely to report barriers such as availability of services, accessibility of services

(e.g. professionals unavailable in the area or at the time, waiting too long, lack of transportation) and familial responsibilities such as childcare.

Despite the important mental health needs of disaster victims, to this day no study has taken an interest in gender differences in mental health services utilization and barriers to mental health treatment after a natural disaster such as a wildfire. An increased understanding of these could help guide efforts to adapt available treatments and provide insight into how to increase their acceptability and accessibility for the specific needs of men and women.

The main objective of this study was to document the proportion of men and women who received mental health services (information, medication and psychological help) in the 12 months following the Fort McMurray fires and to determine if mental health services utilization differed by gender. It was hypothesized that a minority of evacuees would have received help and that women would have received services in a greater proportion than men. We were also interested to see if services utilization differed by gender among individuals with a probable diagnosis of PTSD, insomnia or depression. We decided to investigate gender differences in these three particular diagnoses as they appear to be the most prevalent in individuals who have endured a natural disaster.

A second objective was to evaluate the reasons for not receiving services among participants who reported that they would have needed them and to determine if these barriers differed according to gender. It was hypothesized that men would present barriers to care related to personal motivation (i.e. self-reliance, stigma and pessimism) more frequently than women, and that women would present barriers related to the structure of services (i.e., availability and accessibility) more frequently than men.

Methods

Participants and Procedure

Participants were 1510 evacuees from the 2016 Fort McMurray wildfires who were at least 18 years old, and spoke sufficient English. A phone survey was conducted by a professional survey firm (Bureau d'Intervieweurs Professionnels) from May to July 2017. Participants were recruited by random telephone sampling. A list of 20,000 numbers from the Fort McMurray area was randomly obtained (10,000 home phone numbers and 10,000 cell phone numbers), and 12,318 of these numbers were contacted. Of these, 6237 were invalid phone numbers and 4571 did not answer, refused to participate, were excluded or were admissible respondents without completed interviews. The survey response rate was 40.2% (see Online Appendix 1 for more details). Participants

were asked to verify that they were evacuated from their home during the 2016 fires, were informed of the objectives of the study and provided their informed verbal consent to participate.

Measures

Sociodemographic information included gender, age, marital status, ethnicity and identification as a member of a First Nation. On the question “What is your gender?”, participants could select one of the following options: female, male, non-binary/third gender, prefer to self-describe (specify) and prefer not to say. Participants were also asked questions regarding consequences of the fires and of the evacuation (e.g. whether they lost or suffered considerable damage to their house or apartment, furniture or appliances, sentimental possessions, cars or trucks and pets).

The *Perceived Need for Care Questionnaire* (PNCQ; Meadows et al. 2000) was used to assess mental health needs and services received by participants in the past 12 months for three types of services: (1) information about psychological problems, treatments or available resources, (2) medication for problems with emotions, mental health or use of alcohol or drugs and (3) counseling, therapy or psychological help. A first question was asked to determine whether participants received the service in the past 12 months. If they did not, they were then asked if they would have needed it. In the case of an unmet need, participants were asked to select the reason(s) why they did not receive the help among a list of seven possible barriers: (1) Self-reliance (preferred to manage themselves); (2) Pessimism (did not think it would help); (3) Ignorance (did not know how or where to get it); (4) Stigma (were afraid to ask for it or what others would think of them); (5) Finance (could not afford to pay); (6) Non response (they asked but did not get it) and (7) Have thought about it, but have not gotten around to do it. Participants could also select the option “Other reason” and specify another reason. Barriers were coded as present (1) or absent (0). Following the method used in Hyshka et al. (2017), barriers to care were classified into two broader categories: motivational barriers (Self-reliance, Pessimism and Stigma) and structural barriers (Ignorance, Finance, Non response, Help not available or offered). Answers from the option “Other reason” were grouped into new barriers when mentioned at least five times and were placed within one of the broader categories when applicable. The PNCQ has been largely used in clinical samples, including participants suffering from PTSD, depression and insomnia (Fleury et al. 2016; Meadows et al. 2002; Prins et al. 2011) and was found to have good psychometric properties (Meadows et al. 2000).

The *PTSD Checklist for DSM-5* (PCL-5; Weathers et al. 2013) was used to assess probable and subclinical PTSD. This self-reported questionnaire includes 20 items on a

5-point Likert scale (from 0 = *Not at all* to 4 = *Extremely*) evaluating posttraumatic symptoms in the past month. The PCL-5 provides a probable PTSD diagnosis by considering items rated at least 2 (*Moderately*) as endorsed symptoms and following the DSM-5 diagnostic rule (Blevins et al. 2015; Wortmann et al. 2016). The PCL-5 was found to have strong psychometric properties; strong internal consistency and excellent convergent, discriminant and structural validity across a variety of trauma-exposed samples (Blevins et al. 2015; Bovin et al. 2016). In the present study, the PCL-5 total score demonstrated strong internal consistency (Cronbach’s $\alpha=0.95$). Based on the method used by Mota et al. (2016), endorsement of two or three of the four PTSD criteria (B-E) was classified as subclinical symptoms, whereas endorsing less than two criteria was classified as absence of symptoms or low symptoms.

The *Patient Health Questionnaire Depression Scale* (PHQ-9; Kroenke et al. 2001) was used to assess probable and subclinical depression. This self-reported questionnaire includes nine items on a 4-point Likert scale (from 0 = *Not at all* to 3 = *Nearly every day*) evaluating depressive symptoms in the past two weeks. These nine items represent the DSM criteria for major depressive disorder and thus Kroenke et al. (2001) proposed a diagnostic approach for interpreting the PHQ-9, considering items rated 2 or higher (*More than half the days*) as endorsed symptoms (excepted the ninth item regarding suicidal ideation, which is considered endorsed no matter the frequency). Consistent with the DSM-5 diagnostic rule, the PHQ-9 can provide a probable depression diagnosis if five depressive symptoms are endorsed and one of the symptoms is a depressive mood or anhedonia (Kroenke et al. 2001). The PHQ-9 has been validated as a diagnostic tool (Kroenke et al. 2001) and has been proven to show excellent psychometric properties (Löwe et al. 2004). In the present study, the PHQ-9 total score demonstrated good internal consistency (Cronbach’s $\alpha=0.89$). Based on the method used by Khaled (2019) and Crockett et al. (2020), endorsing two to four depressive symptoms with at least one of them being depressive mood or anhedonia was classified as subclinical symptoms, whereas not meeting these requirements was classified as absence of symptoms or low symptoms.

The *Insomnia Severity Index* (ISI; Morin 1993) was used to assess probable and subclinical insomnia. This self-reported questionnaire includes seven items rated on a 5-point Likert scale (from 0 = *No problem* to 4 = *Very severe problem*) that evaluate sleep difficulties in the past two weeks. Total severity scores range from 0 to 28, with a higher score indicating a higher severity of insomnia. A score of 15 or higher indicates a clinical insomnia, a score between 8 and 14 represents sub-threshold insomnia and a score of 7 or less indicates an absence of insomnia (Morin et al. 2011). The self-reported version of the ISI has been

proven to show excellent psychometric properties (Morin et al. 2011) and a close convergence with a clinician rating (Bastien et al. 2001). In the present study, the ISI total score demonstrated strong internal consistency (Cronbach's $\alpha = 0.92$). For the purpose of the present study, a total score of 15 or higher was classified as a probable diagnosis of insomnia, a score between 8 and 14 was classified as sub-clinical symptoms and a score of 7 or lower was classified as an absence of symptoms.

Data Analyses

Chi-square tests of independence and *t*-tests were first conducted to assess whether sociodemographic variables (ethnicity, marital status, education level, membership in a First Nation, mean age and degree of loss due to the fire) were associated to either gender or having received help. Chi-square tests of independence explored gender differences in services utilization. Logistic regression analyses were used to evaluate if gender was a significant predictor of mental health services utilization after controlling for confounding variables associated to each type of service among mental health diagnosis, age, marital status, ethnicity, level of education and damages or losses experienced from the fires. A second analysis was then run removing predictors that were non-significant in the first analysis. Chi-square tests of independence assessed gender differences in barriers to care when assumptions were met (i.e., sufficient number of participants per cell). All analyses were run with SPSS Statistics version 25, with a significance threshold of 0.05.

Results

Table 1 presents sociodemographic characteristics of participants. Participant age ranged from 18 to 87, with a mean age of 44. All participants identified to either male (44.5%) or female (55.5%) gender. There were significant differences between men and women in marital status [$\chi^2(1, N = 1510) = 5.969, p < 0.05$] and ethnicity [$\chi^2(1, N = 1510) = 15.331, p < 0.001$]; women were overrepresented in participants who are married or in a relationship and in Caucasian participants, and men were overrepresented in single, divorced or widowed participants and participants identifying to ethnic minorities. No gender differences were found regarding age [$t(1364) = -1.710, p = 0.088$], identification as a member of a First Nation [$\chi^2(1, N = 1510) = 0.071, p = 0.790$] and level of education [$\chi^2(1, N = 1510) = 0.287, p = 0.592$]. No gender differences were found in each type of loss due to the fire: house or apartment [$\chi^2(1, N = 1509) = 1.041, p = 0.308$], furniture or appliances [$\chi^2(1, N = 1507) = 0.940, p = 0.332$], possessions with sentimental value [$\chi^2(1, N = 1509) = 0.127, p = 0.722$], cars or

Table 1 Sociodemographic characteristics of participants (N = 1510)

Sample characteristics	M	SD
Age	44.11	12.69
	<i>n</i>	%
18–24	82	5.5
25–34	301	20.0
35–44	390	26.0
45–54	373	24.8
55–64	277	18.4
65 or more	79	5.3
Gender		
Female	838	55.5
Male	672	44.5
Member of a First Nation	93	6.2
Ethnicity		
Caucasian	1116	73.9
Other ^a	385	25.5
Marital status		
Single, separated, divorced or widowed	399	26.4
Married or partner	1105	73.2
Education		
Primary or Secondary	439	29.1
Postsecondary	1067	70.7

^a Including in decreasing proportion, Asian/Middle Eastern/Pacific Islander, Black or African American, Native American or American Indian, Hispanic or Latino, Metis, European, Other

trucks [$\chi^2(1, N = 1509) = 0.048, p = 0.827$] and pets [$\chi^2(1, N = 1509) = 0.354, p = 0.552$].

Caucasian participants were more likely than participants from ethnic minorities to receive all three services. Participants who are married or in a relationship were more likely to receive information than those who are single, divorced or widowed, but less likely to receive medication. Participants with a postsecondary level of education were more likely to receive information and psychological help than those with a secondary education or less. Younger participants were more likely to receive psychological help than older participants (all $p < 0.05$). All other associations were nonsignificant. Chi-square analyses showed that participants who lost or suffered considerable damage to their house or apartment, furniture or appliances, possessions with sentimental value, cars or trucks, or pets were more likely to have received psychological help than those who did not (all $p < 0.05$). Detailed results can be found in Online Appendix 2.

Mental Health Services Utilization

Tables 2, 3 and 4 present rates of utilization for each type of service (information, medication and counseling, therapy or

Table 2 Proportion of men and women who have received information about psychological problems, treatments or available resources in the past 12 months

	Total	Men	Women	χ^2
PTSD				
Probable diagnosis ($n=267$)	134 (50.2%)	42 (41.6%)	92 (55.4%)	5.035*
Subclinical symptoms ($n=324$)	176 (54.3%)	45 (41.7%)	131 (60.6%)	10.455***
Depression				
Probable diagnosis ($n=118$)	69 (58.5%)	28 (53.8%)	41 (62.1%)	0.820
Subclinical symptoms ($n=79$)	33 (41.8%)	6 (17.6%)	27 (60.0%)	14.283***
Insomnia				
Probable diagnosis ($n=204$)	117 (57.4%)	38 (50.0%)	79 (61.7%)	2.901
Subclinical symptoms ($n=352$)	177 (50.3%)	59 (41.8%)	118 (55.9%)	6.703*
Any disorder (PTSD, depression or insomnia)				
At least one with a probable diagnosis ($n=366$)	190 (51.9%)	57 (42.9%)	133 (57.1%)	7.093**
At least one with subclinical symptoms ($n=600$)	310 (51.7%)	92 (40.4%)	218 (58.6%)	18.856***
No/Low symptoms ($n=713$)	233 (32.7%)	107 (29.7%)	126 (35.8%)	2.982
Ethnicity				
Caucasian ($n=1116$)	521 (46.7%)	188 (40.6%)	333 (51.0%)	11.705**
Other ^a ($n=385$)	113 (29.4%)	47 (23.0%)	66 (36.5%)	8.336**
Marital status				
Married or partner ($n=1105$)	483 (43.7%)	167 (35.5%)	316 (49.8%)	22.192***
Single, separated, divorced or widowed ($n=399$)	149 (37.3%)	66 (33.3%)	83 (41.3%)	2.701
Education				
Primary or Secondary ($n=439$)	155 (35.3%)	61 (30.5%)	94 (39.3%)	3.717
Post-secondary ($n=1067$)	479 (44.9%)	174 (37.0%)	305 (51.1%)	21.008***
Lost or suffered considerable damage to				
House or apartment ($n=427$)	185 (43.3%)	64 (35.4%)	121 (49.2%)	8.077**
Furniture, appliances or other household contents ($n=698$)	310 (44.4%)	114 (37.9%)	196 (49.4%)	9.130**
Sentimental possessions ($n=210$)	90 (42.9%)	36 (39.6%)	54 (45.4%)	0.605
Cars or trucks ($n=183$)	80 (43.7%)	23 (28.7%)	57 (55.3%)	12.938***
Pets ($n=66$)	31 (47.0%)	12 (44.4%)	19 (48.7%)	0.117
Total (N=1510)	635 (42.1%)	235 (35.0%)	400 (47.7%)	24.904***

Totals do not always reach 100% since participants could choose not to answer (prefer not to say)

^a Including in decreasing proportion, Asian/Middle Eastern/Pacific Islander, Black or African American, Native American or American Indian, Hispanic or Latino, Metis, European, Other

* $p < .05$. ** $p < .01$. *** $p < .001$

psychological help) in all participants, as well as in men and women. These rates are also presented for the overall sample, separated by probable diagnoses and subclinical symptoms of PTSD, depression and insomnia, and separated by sociodemographic and fire exposure variables.

Six hundred and thirty-five participants (42.1%) reported having received information about problems with their emotions, mental health or use of alcohol or drugs in the year following the wildfire and evacuation (Table 2). Forty-eight percent of the women in the sample had received information, compared to 35% of men [$\chi^2(1, N=1510)=29.904, p < 0.001$]. When examining these proportions broken down into subgroups of individuals presenting with probable diagnoses (of PTSD, insomnia or depression), subclinical

symptoms or no/low symptoms (see Table 2), this greater representation of women was found consistently, except for probable depression, probable insomnia, and no/low symptoms. Gender was a statistically significant predictor of receiving information ($p < 0.001$), even after statistical control for variables associated with gender or receiving information, with women 1.50 times more likely than men to have received information (Table 5).

One hundred and ninety-five participants (12.9%) reported having received medication for problems with their emotions, mental health or use of alcohol or drugs in the year following the fires (Table 3). In participants with at least one probable diagnosis, 31.4% received medication. Women received medication in a statistically greater

Table 3 Proportion of men and women who have received medication for problems with emotions, mental health or use of alcohol or drugs in the past 12 months

	Total	Men	Women	χ^2
PTSD				
Probable diagnosis ($n=267$)	79 (29.6%)	25 (24.8%)	54 (32.5%)	1.823
Subclinical symptoms ($n=324$)	66 (20.4%)	19 (17.6%)	47 (21.8%)	0.771
Depression				
Probable diagnosis ($n=118$)	45 (38.1%)	20 (38.5%)	25 (37.9%)	0.004
Subclinical symptoms ($n=79$)	25 (31.6%)	5 (14.7%)	20 (44.4%)	7.918**
Insomnia				
Probable diagnosis ($n=204$)	77 (37.7%)	27 (35.5%)	50 (39.1%)	0.254
Subclinical symptoms ($n=352$)	65 (18.5%)	20 (14.2%)	45 (21.3%)	2.864
Any disorder (PTSD, depression or insomnia)				
At least one with a probable diagnosis ($n=366$)	115 (31.4%)	35 (26.3%)	80 (34.3%)	2.527
At least one with subclinical symptoms ($n=600$)	117 (19.5%)	34 (14.9%)	83 (22.3%)	4.931*
No/Low symptoms ($n=713$)	20 (2.8%)	7 (1.9%)	13 (3.7%)	2.011
Ethnicity				
Caucasian ($n=1116$)	156 (14.0%)	47 (10.2%)	109 (16.7%)	9.639**
Other ^a ($n=385$)	37 (9.6%)	15 (7.4%)	22 (12.2%)	2.546
Marital status				
Married or partner ($n=1105$)	127 (11.5%)	35 (7.4%)	92 (14.5%)	13.165***
Single, separated, divorced or widowed ($n=399$)	68 (17.0%)	28 (14.1%)	40 (19.9%)	2.340
Education				
Primary or Secondary ($n=439$)	51 (11.6%)	14 (7.0%)	37 (15.5%)	7.628**
Post-secondary ($n=1067$)	144 (13.5%)	49 (10.4%)	95 (15.9%)	6.783**
Lost or suffered considerable damage to				
House or apartment ($n=427$)	64 (15.0%)	23 (12.7%)	41 (16.7%)	1.283
Furniture, appliances or other household contents ($n=698$)	100 (14.3%)	39 (13.0%)	61 (15.4%)	0.809
Sentimental possessions ($n=210$)	34 (16.2%)	14 (15.4%)	20 (16.8%)	0.077
Cars or trucks ($n=183$)	30 (16.4%)	12 (15.0%)	18 (17.5%)	0.201
Pets ($n=66$)	9 (13.6%)	6 (22.2%)	3 (7.7%)	–
Total (N=1510)	195 (12.9%)	63 (9.4%)	132 (15.8%)	13.484***

Totals do not always reach 100% since participants could choose not to answer (prefer not to say)

^a Including in decreasing proportion, Asian/Middle Eastern/Pacific Islander, Black or African American, Native American or American Indian, Hispanic or Latino, Metis, European, Other

* $p < .05$. ** $p < .01$. *** $p < .001$

proportion than men [$\chi^2(1, N = 1510) = 13.484, p < 0.001$]. Sixteen percent of the women in the sample received medication for psychological problems, compared to 9.4% of men. This greater representation of women was found in some diagnoses, including subclinical symptoms of depression and presence of at least one disorder with subclinical symptoms. Gender was a statistically significant predictor of receiving medication ($p < 0.05$), even after statistical control for variables associated with gender or receiving medication, with women 1.54 times more likely than men to have received medication (Table 5).

Two hundred and fifty-three participants (16.8%) reported having received psychotherapy or counseling for problems

with their emotions, mental health or use of alcohol or drugs in the year following the fires (Table 4). In participants with at least one probable diagnosis, 33.9% received psychological help. A chi-square analysis of statistical independence revealed that women received psychotherapy or counseling in a statistically greater proportion than men [$\chi^2(1, N = 1510) = 30.137, p < 0.001$]. Twenty-two percent of the women in the sample received help a year after the fire, against 10.9% of men. This greater representation of women was found consistently among diagnoses, except from probable depression, subclinical symptoms of depression and no/low symptoms. Gender was a statistically significant predictor of receiving counseling or psychotherapy ($p < 0.001$),

Table 4 Proportion of men and women who have received counseling, therapy or psychological help in the past 12 months

	Total	Men	Women	χ^2
PTSD				
Probable diagnosis ($n=267$)	88 (33.0%)	21 (20.8%)	67 (40.4%)	10.883**
Subclinical symptoms ($n=324$)	83 (25.6%)	19 (17.6%)	64 (29.6%)	5.475*
Depression				
Probable diagnosis ($n=118$)	49 (41.5%)	17 (32.7%)	32 (48.5%)	2.987
Subclinical symptoms ($n=79$)	20 (25.3%)	6 (17.6%)	14 (31.1%)	1.857
Insomnia				
Probable diagnosis ($n=204$)	75 (36.8%)	21 (27.6%)	54 (42.2%)	4.346*
Subclinical symptoms ($n=352$)	89 (25.3%)	27 (19.1%)	62 (29.4%)	4.687*
Any disorder (PTSD, depression or insomnia)				
At least one with a probable diagnosis ($n=366$)	124 (33.9%)	31 (23.3%)	93 (39.9%)	10.423**
At least one with subclinical symptoms ($n=600$)	149 (24.8%)	41 (18.0%)	108 (29.0%)	9.246**
No/low symptoms ($n=713$)	45 (6.3%)	17 (4.7%)	28 (8.0%)	3.175
Ethnicity				
Caucasian ($n=1116$)	212 (19.0%)	60 (13.0%)	152 (23.3%)	18.744***
Other ^a ($n=385$)	40 (10.4%)	13 (6.4%)	27 (14.9%)	7.521**
Marital status				
Married or partner ($n=1105$)	173 (15.7%)	43 (9.1%)	130 (20.5%)	26.226***
Single, separated, divorced or widowed ($n=399$)	79 (19.8%)	29 (14.6%)	50 (24.9%)	6.573*
Education				
Primary or Secondary ($n=439$)	52 (11.8%)	19 (9.5%)	33 (13.8%)	1.935
Post-secondary ($n=1067$)	201 (18.8%)	54 (11.5%)	147 (24.6%)	29.669***
Lost or suffered considerable damage to				
House or apartment ($n=427$)	87 (20.4%)	26 (14.4%)	61 (24.8%)	6.995**
Furniture, appliances or other household contents ($n=698$)	142 (20.3%)	44 (14.6%)	98 (24.7%)	10.707**
Sentimental possessions ($n=210$)	48 (22.9%)	16 (17.6%)	32 (26.9%)	2.534
Cars or trucks ($n=183$)	43 (23.5%)	13 (16.3%)	30 (29.1%)	4.153*
Pets ($n=66$)	19 (28.8%)	6 (22.2%)	13 (33.3%)	0.961
Total (N=1510)	253 (16.8%)	73 (10.9%)	180 (21.5%)	30.137***

Totals do not always reach 100% since participants could choose not to answer (prefer not to say)

^a Including in decreasing proportion, Asian/Middle Eastern/Pacific Islander, Black or African American, Native American or American Indian, Hispanic or Latino, Metis, European, Other

* $p < .05$. ** $p < .01$. *** $p < .001$

even after controlling for variables associated with gender or receiving counseling or psychotherapy, with women 1.86 times more likely than men to have received psychotherapy or counseling (Table 5).

Barriers to Mental Health Care

The main reasons for not receiving information were a preference to self-manage (26.8%), not knowing how or where to get information (23.2%) and thinking about it but not getting around to do it (17.9%) (Table 6). The main barriers to receiving medication in the past year were a preference to self-manage (47.2%), thinking about it but not getting around to do it (17.0%), not being able to afford

to pay (9.4%) and reluctance to take medication (9.4%). The main barriers in having received psychotherapy or counseling in the past year were a preference to self-manage (50.7%), thinking about it but not getting around to do it (13.0%) and thinking it would not help (7.7%). For all three types of services, no gender differences were found in the prevalence of individual barriers. Motivational barriers were present in a higher proportion of participants than structural barriers, up to four times more likely for medication and psychological help. Structural barriers were reported in a higher proportion for information (41.1%), whereas motivational barriers were reported in a higher proportion for psychological help (69.9%). No

Table 5 Prediction of mental health services utilization by gender, controlling for sociodemographic variables

Information							
Predictors	Beta	SE	Wald statistic	P value	OR	95% CI	Adjusted R ²
<i>Step 1</i>							.020
Gender	0.505	0.107	22.206	< .001	1.657	1.343 – 2.044	
<i>Step 2</i>							.078
Gender	0.408	0.110	13.730	< .001	1.504	1.212 – 1.866	
Presence of at least one diagnosis	0.595	0.126	22.129	< .001	1.812	1.415 – 2.322	
Ethnicity	–0.775	0.131	35.011	< .001	0.461	0.356 – 0.595	
Level of education	0.473	0.122	15.141	< .001	1.605	1.265 – 2.037	
Medication							
Predictors	Beta	SE	Wald statistic	P value	OR	95% CI	Adjusted R ²
<i>Step 1</i>							.016
Gender	0.581	0.164	12.521	< .001	1.787	1.296 – 2.466	
<i>Step 2</i>							.171
Gender	0.429	0.174	6.089	.014	1.536	1.092 – 2.160	
Presence of at least one diagnosis	1.788	0.166	115.765	< .001	5.975	4.314 – 8.274	
Marital status	–0.383	0.176	4.730	.030	0.682	0.483 – 0.963	
Ethnicity	–0.582	0.206	7.975	.005	0.559	0.373 – 0.837	
Counseling, therapy or psychological help							
Predictors	Beta	SE	Wald statistic	P value	OR	95% CI	Adjusted R ²
<i>Step 1</i>							.033
Gender	0.784	0.150	27.236	< .001	2.190	1.632 – 2.940	
<i>Step 2</i>							.176
Gender	0.620	0.158	15.386	< .001	1.858	1.363 – 2.532	
Presence of at least one diagnosis	1.536	0.155	98.411	< .001	4.644	3.429 – 6.290	
Age	0.026	0.006	17.793	< .001	1.027	1.014 – 1.039	
Ethnicity	–0.916	0.197	21.599	< .001	0.400	0.272 – 0.589	
Level of education	0.710	0.179	15.802	< .001	2.034	0.347 – 0.698	

Male participants, Caucasians, those with a secondary level of education or less and those who are single or separated were the reference groups

gender differences were found in types of barriers reported (all $p > 0.05$; see Table 6).

Discussion

This study examined the hypothesis that only a minority of evacuees from the Fort McMurray wildfires utilized mental health services (information, medication and psychological help) in the year following the event and that the utilization was higher in women than in men. It also examined the hypothesis that mental health services utilization and barriers to treatment differed in men and women. Our results confirmed that a minority of evacuees received services in the year following the fires. However, these results must

be interpreted in light of the usual utilization rates in the Alberta province. Regarding psychological services, data from the Canadian Community Health Survey showed that 11.4% of Albertans had received professional psychological services in 2012 (Statistics Canada 2013), whereas our study found a 16.8% utilization rate for psychotherapy or counseling. Therefore, it seems that the utilization of psychological services in the year following the fires was similar to the utilization of such services in general. In those who presented at least one probable diagnosis (PTSD, insomnia or depression), only half received information and less than a third received medication or psychological help. These numbers are worrisome, considering the great efforts of the government, the Regional Municipality of Wood Buffalo and Albertan organizations to provide evacuees with support and

Table 6 Barriers to receiving information, medication and psychological help in men and women with a perceived need

Information				
Barrier	Total (N = 56)	Men (n = 26)	Women (n = 30)	χ^2
Motivational	30 (53.6%)	16 (61.5%)	14 (46.7%)	1.239
Self-reliance (preferred to manage yourself)	15 (26.8%)	7 (26.9%)	8 (26.7%)	0.000
Pessimism (did not think it would help)	4 (7.1%)	2 (7.7%)	2 (6.7%)	–
Stigma (was afraid to ask for information or what others would think)	4 (7.1%)	4 (15.4%)	0 (0.0%)	–
Thought about it but haven't gotten around to do it	10 (17.9%)	4 (15.4%)	6 (20.0%)	–
Structural	23 (41.1%)	10 (38.5%)	13 (43.3%)	0.137
Ignorance (did not know how or where to get help)	13 (23.2%)	5 (19.2%)	8 (26.7%)	0.432
Nonresponse (asked but did not get information)	3 (5.4%)	0 (0.0%)	3 (10.0%)	–
Finance (could not afford to pay)	9 (16.1%)	3 (11.5%)	6 (20.0%)	–
Information was unavailable	4 (7.1%)	3 (11.5%)	1 (3.3%)	–
Other reasons ^a	9 (16.1%)	1 (3.8%)	8 (26.7%)	–
Medication				
Barrier	Total (N = 53)	Men (n = 16)	Women (n = 37)	χ^2
Motivational	35 (66.0%)	13 (81.3%)	22 (59.5%)	2.365
Self-reliance (preferred to manage yourself)	25 (47.2%)	10 (62.5%)	15 (40.5%)	2.161
Pessimism (did not think it would help)	4 (7.5%)	2 (12.5%)	2 (5.4%)	–
Stigma (was afraid to ask for medication or what others would think)	1 (1.9%)	1 (6.3%)	0 (0.0%)	–
Thought about it but haven't gotten around to do it	9 (17.0%)	2 (12.5%)	7 (18.9%)	–
Reluctant to take medication	5 (9.4%)	3 (18.8%)	2 (5.4%)	–
Structural	8 (15.1%)	4 (25.0%)	4 (10.8%)	–
Ignorance (did not know how or where to get help)	2 (3.8%)	1 (6.3%)	1 (2.7%)	–
Nonresponse (asked but did not get medication)	2 (3.8%)	1 (6.3%)	1 (2.7%)	–
Finance (could not afford to pay)	5 (9.4%)	3 (18.8%)	2 (5.4%)	–
Other reasons ^b	11 (20.8%)	1 (6.3%)	10 (27.0%)	–
Counseling, therapy or psychological help				
Barrier	Total (N = 339)	Men (n = 148)	Women (n = 191)	χ^2
Motivational	237 (69.9%)	107 (72.3%)	130 (68.1%)	0.711
Self-reliance (preferred to manage yourself)	172 (50.7%)	78 (52.7%)	94 (49.2%)	0.406
Pessimism (did not think it would help)	26 (7.7%)	15 (10.1%)	11 (5.8%)	2.255
Stigma (was afraid to ask for it or what others would think)	9 (2.7%)	6 (4.1%)	3 (1.6%)	–
Thought about it but haven't gotten around to do it	44 (13.0%)	16 (10.8%)	28 (14.7%)	1.094
Structural	52 (15.3%)	25 (16.9%)	27 (14.1%)	0.488
Ignorance (did not know how or where to get help)	22 (6.5%)	11 (7.4%)	11 (5.8%)	0.385
Nonresponse (asked but did not get it)	9 (2.7%)	4 (2.7%)	5 (2.6%)	–
Finance (could not afford to pay)	16 (4.7%)	7 (4.7%)	9 (4.7%)	0.000
Help was unavailable or not offered	10 (2.9%)	4 (2.7%)	6 (3.1%)	–
Unclassified				
Lack of time or was too busy	18 (5.3%)	5 (3.4%)	13 (6.8%)	1.949
Sufficient support from loved ones	13 (3.8%)	6 (4.1%)	7 (3.7%)	0.034
Other reasons ^c	30 (8.8%)	10 (6.8%)	20 (10.5%)	1.426

The question “Would you have needed counseling, therapy or psychological help (...)?” was omitted due to a formatting error after asking participants the question “During the past 12 months, did you receive counseling, therapy or psychological help (...)?”. If they said no, their perceived need for help was unfortunately not evaluated. 886 (58.7%) participants reported as an “other reason” that they did not need the psychological help when the question “Why did you not get [help]?” was asked.

^a Other reasons include, in order of importance, being too busy, having to care for others, perception that others needed it more, it being too anxiety-provoking and having other preoccupations

^b Other reasons include, in order of importance, already being on medication, breastfeeding, doctor not thinking they needed it and following up with a doctor

^c Other reasons include, in order of importance, already being in therapy or receiving medication, not seeking it, having other priorities, perception that others needed it more, being on a waitlist, thinking it's going to pass, help not being provided, people not understanding and geographic distance.

resources in the aftermath of the disaster (Kulig et al. 2017). These numbers are however consistent with the low mental health service utilization observed in studies after other disasters which approximates one third in the first few months following the event (Stuber et al. 2006; Wang et al. 2007a).

As hypothesized, gender differences were observed in the overall sample and in those with probable diagnoses. The difference was marked for psychological help, with women reporting having received help almost twice as much as men. These results are consistent with those of the current literature on disasters, reporting rates of mental health service utilization 1.49 to 1.87 times higher in women (Stuber et al. 2006; van der Velden et al. 2007). In the literature pertaining to use of services for mental health in general, it is recognized that compared to men, women are known to tend to have a higher capacity or openness to recognize their emotional distress or their psychological symptoms (Kessler et al. 1981; Mackenzie et al. 2006). They also report more favorable attitudes towards mental health services (Mackenzie et al. 2006) and higher levels of mental health literacy, a factor known to positively influence the help-seeking process (Rice et al. 2017). In turn, there is a tendency in men to seek treatment only when their symptoms are severe and their internal resources are depleted, or when they have been unsuccessful in using their personal coping strategies (Doblyte and Jiménez-Mejías 2017; Seidler et al. 2016). A qualitative study in Swedish men revealed that generally, the help-seeking process is delayed due to a difficulty accepting and expressing symptoms (Wirback et al. 2018). This could suggest that differences in mental health services utilization after the Fort McMurray wildfires could attenuate over time.

Across all three types of services, no gender differences were found in having received a service in those with probable depression, while differences were found for information and medication in those with subclinical depression. This effect was also observed for information in those with probable insomnia. This result is in line with the hypothesis of a higher threshold of distress severity required in men to seek help. Literature on the subject has shown that men could tend to view depression as a normal feeling that everyone experiences at some point in their lives rather than a disorder, which could heighten their perceived threshold for a “real” illness requiring care (Biddle et al. 2007). Thus, it is possible that men with a probable diagnosis have sought help in a similar proportion to women because this threshold was reached, but that those with subclinical symptoms perceived their symptoms as normal or unworthy of care.

Gender differences were rarer in having received medication. This result could perhaps be explained by the fact that consulting a general practitioner could be easier, more familiar or less stigmatizing than seeking help from a mental health professional, which requires more emotional self-disclosure. This hypothesis is supported by a slightly

lower proportion of participants reporting a stigma barrier to care for medication than for information or psychological help. This result is consistent with a study that revealed that men sought help from primary care physicians significantly more frequently after a volcanic eruption and evacuation in Japan (Goto et al. 2002). In parallel, one study has shown an increase in use of antidepressants in Canadian men and women from 1994 to 2000, and a decrease in the gender difference in taking antidepressants (Patten and Beck 2004).

The present study also aimed to explore reasons for not receiving services among participants who would have needed them. *Self-reliance* was the main barrier to treatment across the three types of services. This result is consistent with studies on participants with anxiety and depression and PTSD sufferers who have gone through various types of traumatic events which found self-reliance to be respectively the most and second most prevalent barrier to obtaining care (Koenen et al. 2003; van Beljouw et al. 2010). The importance of the self-reliance barrier is consistent with the tendency in people to deal with psychological difficulties using personal coping strategies as opposed to validated treatments: insomnia sufferers will often try self-help methods before seeking professional help, such as herbal products and relaxation (Morin et al. 2006) and those exposed to natural disasters will often report an elevated use of alcohol and other substances (Agyapong et al. 2018, 2019; Bryant et al. 2014). A tendency to seek informal help (e.g., from friends and family) rather than professional help after a disaster was also reported (Carr et al. 1997). However, in a post-disaster context where needs may be higher than usual, such behaviors may prove adaptive for individuals with milder symptoms.

The high prevalence of the barrier *thinking about it but not getting around to do it* is not surprising since avoidance is the core of most psychopathologies, including PTSD and depression. PTSD involves the avoidance of trauma-related thoughts, feelings or external reminders of the event (American Psychiatric Association 2013), and depression is often characterized by rumination and experiential avoidance (Cribb et al. 2006; Nolen-Hoeksema 2000), rather than constructive problem-solving. It is possible that, beyond gender difference, the nature of the disorders themselves, which features avoidance and indecisiveness, complicate or delay help-seeking. Active ways to reach out to these individuals may be needed. This may be especially relevant given that the observed barriers to care were motivational in a higher proportion than structural.

How can we increase mental health services utilization among natural disaster victims, especially men, who receive help in a lower proportion? Some studies have suggested solutions such as brochures, psychoeducational videos including “first-person” testimonials, and training medical doctors to engage men in discussions about mental

health (Hammer and Vogel 2010; Martielli 2007; Susukida et al. 2015). Since primary care providers often represent the gateway to mental health services, educating them on trauma-related symptoms could ensure appropriate referrals of their patients to specialized services or self-treatment, depending on symptom severity. Among disaster victims in general, psychoeducation efforts could focus on providing the population with information on specific symptoms that indicate one may need help from a professional and on awareness on the importance of taking care of one's mental health in the post-disaster context. For those with milder symptoms, an interesting option combining psychotherapy and self-reliance is bibliotherapy or online therapy, which is less directive than classic face-to-face therapy and may reach those who believe they can self-manage.

Our study presents some limitations. First, participants responded to self-reported questionnaires, which could have overestimated the number of people reporting probable diagnoses. The use of the diagnostic algorithm scoring method for the PHQ-9 seemed more suitable for our study, especially regarding the subclinical symptoms category, considering the lack of a clear definition of subclinical depression or cut-off score for the PHQ-9 and the correspondence of the items with the DSM-5 criteria. However, it should be noted that the PHQ-9 is most widely used as a severity measure for depression, using validated cut-off scores. Therefore, the use of this approach may have had an impact on the categorizations of the depression groups in our study, including an underdetection of depression due to a low sensitivity (Manea et al. 2015). Also, it is possible that persons with more severe symptoms may not have been reached, for example if they were unreachable by phone. Our assessment of gender could have been more optimal, as we didn't evaluate gender roles or differentiate gender identity from biological sex. Therefore, it is impossible to differentiate cisgender from transgender individuals in our study. Moreover, the impact of employment status or annual income on services utilization could not be evaluated since these variables were not included. Despite these limitations, our study was among the first to explore barriers to mental health services utilization in a post-disaster context, and the first to our knowledge to explore gender differences in mental health services utilization in this population. The representative sample size is considerable and includes community members who were all exposed to the same event rather than various traumatic experiences.

Further research could take an interest in potential mediating variables explaining gender differences in help-seeking, including personality traits (Schomerus et al. 2013), self-efficacy (Garfin et al. 2014), and mental health literacy (Tomczyk et al. 2018). Mental health services utilization could be explored even further, evaluating dosage of help received and treatment adherence, as well as validating

self-report data against official census data. It could also be interesting to evaluate gender differences in help-seeking and barriers in a longitudinal manner, since men possibly seek help later in time. Finally, future research should focus on the development of more accessible and self-directed types of treatments for natural disaster victims, such as bibliotherapy or online evidence-based treatments.

Our research showed that among the Fort McMurray fire evacuees, mental health services utilization was significantly higher in women than in men, controlling for sociodemographic variables and presence of at least one probable diagnosis. It also revealed that the main barrier in services utilization in evacuees was self-reliance, which suggest the importance of focusing efforts on the development of treatments fostering personal autonomy in managing one's mental health after a disaster. Importantly, our findings may bear upon the present COVID-19 pandemic. This broader disaster may also lead to low utilization despite high need, and the same barriers are likely to manifest, highlighting the importance of monitoring men's services utilization, of emphasizing the value of seeking psychological help and of developing large scale self-directed treatment options.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10488-021-01114-w>.

Acknowledgments The first author would like to acknowledge the training award opportunities provided by the Canadian Institutes of Health Research and the Fonds de Recherche Santé Québec during the completion of this study.

Funding This study was funded by the Canadian Institute of Health Research (381288).

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval This study was approved by the Ethics Research Committee of Laval University: Certificate No 2017–030/28–03-2017.

Consent to Participate All participants gave their informed consent prior to their inclusion in the study.

References

- Agyapong, V. I. O., Juhás, M., Brown, M. R. G., Omege, J., Denga, E., Nwaka, B., et al. (2018). Prevalence rates and correlates of probable major depressive disorder in residents of fort mcmurray 6 months after a wildfire. *International Journal of Mental Health and Addiction*, 17(1), 120–136. <https://doi.org/10.1007/s11469-018-0004-8>.
- Agyapong, V. I. O., Juhás, M., Brown, M. R. G., Omege, J., Denga, E., Nwaka, B., et al. (2019). Prevalence rates and correlates of likely post-traumatic stress disorder in residents of fort mcmurray 6 months after a wildfire. *International Journal of Mental*

- Health and Addiction, Advance online publication.* <https://doi.org/10.1007/s11469-019-00096-z>.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA, US: American Psychiatric Publishing Inc.
- Bastien, C. H., Vallieres, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine*, 2(4), 297–307. [https://doi.org/10.1016/s1389-9457\(00\)00065-4](https://doi.org/10.1016/s1389-9457(00)00065-4).
- Biddle, L., Donovan, J., Sharp, D., & Gunnell, D. (2007). Explaining non-help-seeking amongst young adults with mental distress: A dynamic interpretive model of illness behaviour. *Sociology of Health & Illness*, 29(7), 983–1002. <https://doi.org/10.1111/j.1467-9566.2007.01030.x>.
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28(6), 489–498. <https://doi.org/10.1002/jts.22059>.
- Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., & Keane, T. M. (2016). Psychometric properties of the PTSD checklist for diagnostic and statistical manual of mental disorders-fifth edition (PCL-5) in veterans. *Psychological Assessment*, 28(11), 1379–1391. <https://doi.org/10.1037/pas0000254>.
- Bryant, R. A., Waters, E., Gibbs, L., Gallagher, H. C., Pattison, P., Lusher, D., et al. (2014). Psychological outcomes following the Victorian Black Saturday bushfires. *Australian and New Zealand Journal of Psychiatry*, 48(7), 634–643. <https://doi.org/10.1177/0004867414534476>.
- Carr, V. J., Lewin, T. J., Webster, R. A., & Kenardy, J. A. (1997). A synthesis of the findings from the Quake Impact Study: A two-year investigation of the psychosocial sequelae of the 1989 Newcastle earthquake. *Social Psychiatry and Psychiatric Epidemiology*, 32(3), 123–136. <https://doi.org/10.1007/BF00794611>.
- Cribb, G., Moulds, M. L., & Carter, S. (2006). Rumination and experiential avoidance in depression. *Behaviour Change*, 23(3), 165–176. <https://doi.org/10.1375/bech.23.3.165>.
- Crockett, M. A., Martínez, V., & Jiménez-Molina, Á. (2020). Sub-threshold depression in adolescence: Gender differences in prevalence, clinical features, and associated factors. *Journal of Affective Disorders*, 272, 269–276. <https://doi.org/10.1016/j.jad.2020.03.111>.
- Doblyte, S., & Jiménez-Mejías, E. (2017). Understanding help-seeking behavior in depression: A qualitative synthesis of patients' experiences. *Qualitative Health Research*, 27(1), 100–113. <https://doi.org/10.1177/1049732316681282>.
- Fleury, M.-J., Grenier, G., Bamvita, J.-M., Perreault, M., & Caron, J. (2016). Variables associated with perceived unmet need for mental health care in a Canadian epidemiologic catchment area. *Psychiatric Services*, 67(1), 78–85. <https://doi.org/10.1176/appi.ps.201400363>.
- Garfin, D. R., Juth, V., Silver, R. C., Ugalde, F. J., Linn, H., & Inostroza, M. (2014). A national study of health care service utilization and substance use after the 2010 Chilean earthquake. *Psychiatric Services*, 65(11), 1392–1395. <https://doi.org/10.1176/appi.ps.201300500>.
- Goto, T., Wilson, J. P., Kahana, B., & Slane, S. (2002). PTSD, depression and help-seeking patterns following the Miyake Island volcanic eruption. *International Journal of Emergency Mental Health*, 4(3), 157–172.
- Hammer, J. H., & Vogel, D. L. (2010). Men's help seeking for depression: The efficacy of a male-sensitive brochure about counseling. *The Counseling Psychologist*, 38(2), 296–313. <https://doi.org/10.1177/0011000009351937>.
- Hyshka, E., Anderson, J. T., & Wild, T. C. (2017). Perceived unmet need and barriers to care amongst street-involved people who use illicit drugs. *Drug and Alcohol Review*, 36(3), 295–304. <https://doi.org/10.1111/dar.12427>.
- Insurance Bureau of Canada. (2017). Northern Alberta Wildfire Costliest Insured Natural Disaster in Canadian History - Estimate of insured losses: \$3.58 billion. Retrieved from <http://www.abc.ca/bc/resources/media-centre/media-releases/northern-alberta-wildfire-costliest-insured-natural-disaster-in-canadian-history>
- Kessler, R. C. (2000). Posttraumatic stress disorder: The burden to the individual and to society. *The Journal of Clinical Psychiatry*, 61(Suppl 5), 4–14.
- Kessler, R. C., Brown, R. L., & Bromman, C. L. (1981). Sex differences in psychiatric help-seeking: Evidence from four large-scale surveys. *Journal of Health and Social Behavior*, 22(1), 49–64. <https://doi.org/10.2307/2136367>.
- Kessler, R. C., Galea, S., Gruber, M. J., Sampson, N. A., Ursano, R. J., & Wessely, S. (2008). Trends in mental illness and suicidality after Hurricane Katrina. *Molecular Psychiatry*, 13(4), 374–384. <https://doi.org/10.1038/sj.mp.4002119>.
- Khaled, S. M. (2019). Prevalence and potential determinants of sub-threshold and major depression in the general population of Qatar. *Journal of Affective Disorders*, 252, 382–393. <https://doi.org/10.1016/j.jad.2019.04.056>.
- Koenig, K. C., Goodwin, R., Struening, E., Hellman, F., & Guardino, M. (2003). Posttraumatic stress disorder and treatment seeking in a national screening sample. *Journal of Traumatic Stress*, 16(1), 5–16. <https://doi.org/10.1023/A:1022051009330>.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a Brief Depression Severity Measure. *Journal of General Internal Medicine*, 16(9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>.
- Kulig, J., Germann, K., Parker, N., Salt, V., Walker, D., & Scott, C. (2017). Psychosocial response and recovery evaluation of the RMWB wildfire 2016: Final Report. PolicyWise for Children & Families. Retrieved from <https://open.alberta.ca/publications/psychosocial-response-and-recovery-evaluation-of-the-rmwb-wildfire-2016>
- Laugharne, J., Van de Watt, G., & Janca, A. (2011). After the fire: The mental health consequences of fire disasters. *Current Opinion in Psychiatry*, 24(1), 72–77. <https://doi.org/10.1097/YCO.0b013e32833f5e4e>.
- Löwe, B., Unützer, J., Callahan, C. M., Perkins, A. J., & Kroenke, K. (2004). Monitoring depression treatment outcomes with the patient health questionnaire-9. *Medical Care*, 42(12), 1194–1201. <https://doi.org/10.1097/00005650-200412000-00006>.
- Lowe, S. R., Sampson, L., Gruebner, O., & Galea, S. (2016). Mental health service need and use in the aftermath of Hurricane Sandy: Findings in a population-based sample of New York City residents. *Community Mental Health Journal*, 52(1), 25–31. <https://doi.org/10.1007/s10597-015-9947-4>.
- Mackenzie, C. S., Gekoski, W. L., & Knox, V. J. (2006). Age, gender, and the underutilization of mental health services: The influence of help-seeking attitudes. *Aging & Mental Health*, 10(6), 574–582. <https://doi.org/10.1080/13607860600641200>.
- Manea, L., Gilbody, S., & McMillan, D. (2015). A diagnostic meta-analysis of the Patient Health Questionnaire-9 (PHQ-9) algorithm scoring method as a screen for depression. *General Hospital Psychiatry*, 37(1), 67–75. <https://doi.org/10.1016/j.genhosppsych.2014.09.009>.
- Martielli, R.P. (2007). *Effectiveness of psychoeducational interventions in improving men's attitudes towards help seeking for depression*. [Dissertation]. Saint Louis University.
- Meadows, G., Burgess, P., Bobevski, I., Fossey, E., Harvey, C., & Liaw, S. T. (2002). Perceived need for mental health care: Influences of

- diagnosis, demography and disability. *Psychological Medicine*, 32(2), 299–309. <https://doi.org/10.1017/S0033291701004913>.
- Meadows, G., Harvey, C., Fossey, E., & Burgess, P. (2000). Assessing perceived need for mental health care in a community survey: Development of the Perceived Need for Care Questionnaire (PNCQ). *Social Psychiatry and Psychiatric Epidemiology*, 35(9), 427–435. <https://doi.org/10.1007/s001270050260>.
- Morin, C. M. (1993). *Insomnia: Psychological assessment and management*. New York, NY, US: Guilford Press.
- Morin, C. M., Belleville, G., Bélanger, L., & Ivers, H. (2011). The Insomnia Severity Index: Psychometric indicators to detect insomnia cases and evaluate treatment response. *Sleep: Journal of Sleep and Sleep Disorders Research*, 34(5), 601–608. <https://doi.org/10.1093/sleep/34.5.601>.
- Morin, C. M., LeBlanc, M., Daley, M., Gregoire, J. P., & Merette, C. (2006). Epidemiology of insomnia: prevalence, self-help treatments, consultations, and determinants of help-seeking behaviors. *Sleep Medicine*, 7(2), 123–130. <https://doi.org/10.1016/j.sleep.2005.08.008>.
- Mota, N. P., Tsai, J., Sareen, J., Marx, B. P., Wisco, B. E., Harpaz-Rotem, I., et al. (2016). High burden of subthreshold DSM-5 post-traumatic stress disorder in U.S. military veterans. *World Psychiatry*, 15(2), 185–186. <https://doi.org/10.1002/wps.20313>.
- Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, 109(3), 504–511. <https://doi.org/10.1037/0021-843X.109.3.504>.
- Parslow, R. A., & Jorm, A. F. (2000). Who uses mental health services in Australia? An analysis of data from the National Survey of Mental Health and Wellbeing. *Australian and New Zealand Journal of Psychiatry*, 34(6), 997–1008. <https://doi.org/10.1080/000486700276>.
- Patten, S. B., & Beck, C. A. (2004). Major Depression and Mental Health Care Utilization in Canada: 1994 to 2000. *The Canadian Journal of Psychiatry*, 49(5), 303–309. <https://doi.org/10.1177/070674370404900505>.
- Pietrzak, R. H., Goldstein, R. B., Southwick, S. M., & Grant, B. F. (2011). Prevalence and Axis I comorbidity of full and partial post-traumatic stress disorder in the United States: results from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Anxiety Disorders*, 25(3), 456–465. <https://doi.org/10.1016/j.janxdis.2010.11.010>.
- Prins, M., Meadows, G., Bobevski, I., Graham, A., Verhaak, P., van der Meer, K., et al. (2011). Perceived need for mental health care and barriers to care in the Netherlands and Australia. *Social Psychiatry and Psychiatric Epidemiology*, 46(10), 1033–1044. <https://doi.org/10.1007/s00127-010-0266-3>.
- Rice, S. M., Aucote, H. M., Parker, A. G., Alvarez-Jimenez, M., Filia, K. M., & Amminger, G. P. (2017). Men's perceived barriers to help seeking for depression: Longitudinal findings relative to symptom onset and duration. *Journal of Health Psychology*, 22(5), 529–536. <https://doi.org/10.1177/1359105315605655>.
- Roberts, A. L., Gilman, S. E., Breslau, J., Breslau, N., & Koenen, K. C. (2011). Race/ethnic differences in exposure to traumatic events, development of post-traumatic stress disorder, and treatment-seeking for post-traumatic stress disorder in the United States. *Psychological Medicine*, 41(1), 71–83. <https://doi.org/10.1017/S0033291710000401>.
- Schomerus, G., Appel, K., Meffert, P. J., Luppá, M., Andersen, R. M., Grabe, H. J., & Baumeister, S. E. (2013). Personality-related factors as predictors of help-seeking for depression: A population-based study applying the Behavioral Model of Health Services Use. *Social Psychiatry and Psychiatric Epidemiology*, 48(11), 1809–1817. <https://doi.org/10.1007/s00127-012-0643-1>.
- Seidler, Z. E., Dawes, A. J., Rice, S. M., Olliffe, J. L., & Dhillon, H. M. (2016). The role of masculinity in men's help-seeking for depression: A systematic review. *Clinical Psychology Review*, 49, 106–118. <https://doi.org/10.1016/j.cpr.2016.09.002>.
- Slaunwhite, A. K. (2015). The role of gender and income in predicting barriers to mental health care in Canada. *Community Mental Health Journal*, 51(5), 621–627. <https://doi.org/10.1007/s10957-014-9814-8>.
- Statistics Canada (2013). Mental health indicators (table 13–10–0465–01). <https://doi.org/10.25318/1310046501-eng>.
- Stuber, J., Galea, S., Boscarino, J. A., & Schlesinger, M. (2006). Was there unmet mental health need after the September 11, 2001 terrorist attacks? *Social Psychiatry and Psychiatric Epidemiology*, 41(3), 230–240. <https://doi.org/10.1007/s00127-005-0022-2>.
- Susukida, R., Mojtabai, R., & Mendelson, T. (2015). Sex differences in help seeking for mood and anxiety disorders in the national comorbidity survey-replication. *Depression and Anxiety*, 32(11), 853–860. <https://doi.org/10.1002/da.22366>.
- The Canadian Press. (2017). Devastating Fort McMurray wildfire declared out 15 months later. Retrieved from <http://www.cbc.ca/news/canada/edmonton/fort-mcmurray-fire-beast-extinguished-out-1.4271604>
- Tomczyk, S., Muehlan, H., Freitag, S., Stolzenburg, S., Schomerus, G., & Schmidt, S. (2018). Is knowledge “half the battle”? The role of depression literacy in help-seeking among a non-clinical sample of adults with currently untreated mental health problems. *Journal of Affective Disorders*, 238, 289–296. <https://doi.org/10.1016/j.jad.2018.05.059>.
- van Beljouw, I. M. J., Verhaak, P. F. M., Cuijpers, P., van Marwijk, H. W. J., & Penninx, B. W. J. H. (2010). The course of untreated anxiety and depression, and determinants of poor one-year outcome: A one-year cohort study. *BMC Psychiatry*. <https://doi.org/10.1186/1471-244X-10-86>.
- van der Velden, P. G., Yzermans, C. J., Kleber, R. J., & Gersons, B. P. R. (2007). Correlates of mental health services utilization 18 months and almost 4 years postdisaster among adults with mental health problems. *Journal of Traumatic Stress*, 20(6), 1029–1039. <https://doi.org/10.1002/jts.20273>.
- Wang, P. S., Angermeyer, M., Borges, G., Bruffaerts, R., Tat Chiu, W., G. D. E. G., et al. (2007a). Delay and failure in treatment seeking after first onset of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry*, 6(3), 177–185.
- Wang, P. S., Gruber, M. J., Powers, R. E., Schoenbaum, M., Speier, A. H., Wells, K. B., & Kessler, R. C. (2007b). Mental health service use among Hurricane Katrina survivors in the eight months after the disaster. *Psychiatric Services*, 58(11), 1403–1411. <https://doi.org/10.1176/appi.ps.58.11.1403>.
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). *The PTSD Checklist for DSM-5 (PCL-5)*. Retrieved from the National Center for PTSD website: <http://www.ptsd.va.gov>
- Wirback, T., Forsell, Y., Larsson, J.-O., Engström, K., & Edhborg, M. (2018). Experiences of depression and help-seeking described by young Swedish men. *Psychology of Men & Masculinity*, 19(3), 407–417. <https://doi.org/10.1037/men0000110>.
- Wortmann, J. H., Jordan, A. H., Weathers, F. W., Resick, P. A., Donnanville, K. A., Hall-Clark, B., et al. (2016). Psychometric analysis of the PTSD Checklist-5 (PCL-5) among treatment-seeking military service members. *Psychological Assessment*, 28(11), 1392–1403. <https://doi.org/10.1037/pas0000260>.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.