



Introduction

- The 2016 Alberta (AB) wildfires required numerous Public Safety Personnel (PSP; e.g., firefighters, police, paramedics, dispatchers) to extinguish the fires and provide safety operations to those affected.
- In managing the wildfires, PSP were exposed to lifethreatening traumatic events, placing them at a heightened risk for operational stress injuries (OSIs; e.g., post-traumatic stress disorder [PTSD], anxiety disorders, mood disorders). OSIs appear to represent a significant health concern and economic burden for PSP and the communities they serve.
- Research exploring effects of trauma exposure across diverse PSP is limited. The recent devastating effects of the Canadian wildfires prompted the current study exploring the effects of various types of fire-related traumatic exposure on symptom expression across diverse PSP.
- The current study hypothesized that OSIs would be most severe amongst PSP involved in the 2016 AB wildfires, when compared to other types of fire exposure (i.e., Other Wildfire, Other Fire/Non-Wildfire, Non-Fire Exposure), due to the duration



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The Dynamic Impact of Fire Exposure Types on Public Safety Personnel Mental Health

Stephanie L. M. Korol, M.Sc., R. Nicholas Carleton, Ph.D., & Kadie Hozempa, B.A. Anxiety and Illness Behaviours Laboratory, University of Regina, Saskatchewan

Methods

• A total of 5,851 PSP (67% men; $M_{age} = 44.42$, SD =9.14) exposed to potentially traumatic stressors completed the web-based Canadian Institute for Public Safety Research and Treatment (CIPSRT) AX1 prevalence self-report survey, which assessed involvement with diverse potentially traumatic events, and symptoms consistent with OSIs. Participants were categorized based on fire exposure types (AB 2016 Wildfire, *n* = 56; Other Wildfire, *n* = 1127; Other Fire/Non-Wildfire, *n* = 640; Non-Fire Exposure, n = 3015) if they completed the necessary measures for the current study (*n* = 4,838; Figure 1). Non-Fire Exposure was included as a control group of participants exposed to a traumatic stressor that did not include exposure to wildfires or other fires.

Aggregate symptom measure scores were used for analysis of variance (ANOVA) in order to assess for differences in symptom reporting, based on fire exposure type. Analyses were bootstrapped using 1,000 samples for robust probability estimates. Tukey's HSD post-hoc comparisons were used to assess for mean differences between fire exposure group upon significant main effects of the ANOVA.

om Measure Descriptive Statistics by Fire Exposure type							
		n	M	SD	SE	95% CI	
						Lower	Upper
	AB 2016	55	22.66	17.47	2.36	17.93	27.38
	Other Wildfire	1116	24.64	20.02	0.60	23.47	25.82
	Other Fire	633	22.69	19.14	0.76	21.20	24.18
	Non-Fire	2988	22.36	18.66	0.34	21.69	23.03
	AB 2016	52	6.02	4.93	0.68	4.65	7.39
	Other Wildfire	1028	5.82	5.20	0.16	5.50	6.14
	Other Fire	587	5.28	4.79	0.20	4.90	5.67
	Non-Fire	2769	5.53	5.11	0.10	5.34	5.72
	AB 2016	52	14.33	11.57	1.60	11.11	17.55
	Other Wildfire	1020	11.08	11.50	0.36	10.37	11.79
	Other Fire	578	9.62	10.22	0.43	8.78	10.45
	Non-Fire	2721	10.73	10.94	0.21	10.32	11.14
	AB 2016	40	7.40	5.80	0.92	5.55	9.26
	Other Wildfire	846	6.03	5.01	0.17	5.69	6.36
	Other Fire	492	6.92	5.34	0.24	6.45	7.39
	Non-Fire	2351	6.16	5.02	0.10	5.95	6.36
	AB 2016	50	2.68	3.84	0.54	1.59	3.77
	Other Wildfire	983	3.16	4.86	0.16	2.85	3.46
	Other Fire	559	2.69	4.40	0.19	2.32	3.05
	Non-Fire	2598	2.72	4.47	0.09	2.55	2.90
	AB 2016	53	7.08	6.17	0.85	5.37	8.78
	Other Wildfire	1055	7.44	6.15	0.19	7.07	7.81
	Other Fire	602	6.60	5.72	0.23	6.14	7.05
	Non-Fire	2837	6.82	5.91	0.11	6.60	7.04
t-5; SIPS = Social Interaction Phobia Scale; PDSS-SR = Panic Disorder Symptoms Severity Scale, Self-Report; GAD-7 = Generalized Anxiety							

- by fire exposure types.
- (both ps > .05).

Table 3. Analysis of Variance for Symptom Measures by Fire Exposure type								
		SS	df	MS	F	р		
PCL-5	Between	272.00	2	01.02	2.40	015		
Intrusion	Groups	273.09	3	91.03	3.48	.015		
PCL-5	Between	20.04	3	6.95	1 1 0	.348		
Avoidance	Groups	20.84			1.10			
PCL-5	Between	202 70	2		२ ८२	050		
Cognition & Mood Change	Groups	382.78	3	127.59	2.53	.050		
PCL-5	Between	670 47	С	226 10	E 00	001		
Arousal & Reactivity	Groups	079.47	3	220.49	5.82	.001		
PCL-5 Total	Between	1201 02	2	1431.64	3.95	.008		
	Groups	4294.95	5					
GAD-7 Total	Between	127 9/	3	12 65	1 65	176		
	Groups	127.54	5	42.05	1.05	.170		
SIPS Total	Between	1513 12	З	504 37	4 18	006		
	Groups	1313.12		504.57	4.10	.000		
AUDIT Total	Between	337.36	3	112.45	4.38	.004		
	Groups							
PDSS Total	Between	147.215	3	49.07	2.38	.068		
	Groups							
PHQ-9 lotal	Between	375.51	3	125.17	3.54	.014		
	Groups							

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		SS	df	MS	F	р		
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PCL-5	Between	20.94	3	6.95	1.10	.348		
Avoidance	Groups	20.84						
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Note. SS = Sum of Squares; df = degrees of freedom; *MS* = Mean Square; *F* = F-test value; *p* = significance; PCL-5 = PTSD Check List-5; SIPS = Social Interaction Phobia Scale; PDSS-SR = Panic Disorder Symptoms Severity Scale, Self-Report; GAD-7 = Generalized Anxiety Disorder scale; AUDIT = Alcohol Use Disorder Identification Test; PHQ-9 = Patient Health Questionnaire.

Results

• Table 1 displays descriptive statistics for each symptom measure (PTSD Check List-5 [PCL-5]; Social Interaction Phobia Scale [SIPS]; Panic Disorder Symptoms Severity Scale, Self-Report [PDSS-SR]; Generalized Anxiety Disorder scale [GAD-7]; Alcohol Use Disorder Identification Test [AUDIT]; Patient Health Questionnaire [PHQ-9])

There were significant between-group differences on mean scores for the PCL-5, SIPS, PHQ-9, and AUDIT (all ps < .05), but not the PDSS-SR or GAD-7

 Post-hoc tests indicated significant differences as follows: the 'Other Wildfire' group scored higher on PCL-5 total scores than the 'Non-Fire Exposure' group (p = .003); the 'AB 2016 Wildfire' group scored higher on the SIPS than the 'Other Fire' group (p = .016); the 'Other Fire' group scored higher on the AUDIT than the 'Other Wildfire' (p =.010) and 'Non-Fire Exposure' groups (p = .013); finally, the 'Other Wildfire' group scored higher on the PHQ-9 than the 'Other Fire' (p = .028) and 'Non-Fire Exposure' groups (p = .020).



Discussion

- The results suggest that exposures to different types of fire- and non-fire-related events may be associated with different OSI symptom profiles.
- The symptom differences in fire exposure type may reflect something specific to wildfires (e.g., intensity, duration), differences in available posttrauma supports, or other systemic variables.
- Post-hoc exploratory analyses indicated a larger average number of trauma exposures amongst the Other Wildfire group (M = 19.88, SD = 28.94)compared to the AB 2016 Wildfire group (M = 15.37, SD = 24.01), but this difference was not statistically significant (p = .684).
- The size, duration, and media coverage of the 2016 AB wildfires may have been met with more support and mental health resources; however, the results did not indicate a significant difference between the number of PSP supports between the 2016 AB Wildfire group and Other Wildfire group.
- The results support further research, specific to the impact of wildfires, assessing the variations in symptom presentation amongst PSP mental health; results may facilitate efforts at prevention





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