

# Association between a history of child abuse and suicidal ideation, plans and attempts among Canadian public safety personnel: a cross-sectional survey

Sarah Turner MSc, Tamara Taillieu MSc, R. Nicholas Carleton PhD, Jitender Sareen MD, Tracie O. Afifi PhD

## Abstract

**Background:** A history of child abuse has been identified as a risk factor for suicidal behaviour in general population samples; however, it remains unknown how a history of child abuse and career-related trauma together are related to suicidal behaviour. This cross-sectional survey was designed to 1) estimate the prevalence of a history of child abuse among Canadian public safety personnel, 2) examine the associations between child abuse and suicidal behaviour, 3) examine the associations between career-related trauma and suicidal behaviour and 4) examine the cumulative and interactive effects of child abuse and career-related trauma on suicidal behaviour.

**Methods:** Data were drawn from a Web-based survey collected by the Canadian Institute for Public Safety Research and Treatment Team. Child abuse included physical abuse, sexual abuse and exposure to intimate partner violence in childhood. Suicidal behaviour included lifetime ideation, plans and attempt(s). We used logistic regression models to examine the associations between child abuse and suicidal behaviours, and cumulative and interaction models to test the relations between a history of child abuse and career-related trauma on suicidal behaviours.

**Results:** The survey completion rate was 49.3% ( $n = 4199$ ). A total of 2275/4073 respondents (55.9%) reported experiencing 1 or more types of abuse as a child. All types of child abuse and career-related trauma were significantly associated with suicidal behaviour (adjusted odds ratio 1.57–3.25). No cumulative or interaction effects were noted.

**Interpretation:** Both a history of child abuse and career-related trauma were significantly associated with suicidal behaviours; however, stronger relations were seen for the former. This finding may help the development of effective treatment and intervention strategies aimed at reducing suicidal behaviour among public safety personnel.

Public safety personnel in Canada include those working as police, firefighters, paramedics, correctional workers and call centre operators/dispatchers.<sup>1</sup> These people experience substantial mental health problems<sup>2</sup> strongly associated with suicidal behaviour.<sup>3,4</sup> Recent Canadian estimates suggest that 27.8% of public safety personnel report lifetime suicidal ideation, 13.3% report lifetime planning, and 4.6% report a lifetime suicide attempt(s),<sup>5</sup> rates that are higher than representative general population rates of 13.3%, 4.6% and 3.5%, respectively.<sup>6</sup> The Canadian Standing Committee of Public Safety and National Security identified suicide as important to address, along with risk factor research, to inform prevention strategies.<sup>1</sup>

Public safety personnel are commonly exposed to potentially traumatic events,<sup>7–9</sup> which are also associated with sui-

cidal behaviour.<sup>10–14</sup> However, elevated suicidal outcomes were seen among nondeployed US soldiers,<sup>15</sup> and precareer suicidality was elevated among US female firefighters.<sup>16</sup> Accordingly, other possible risk factors, such as a history of child abuse, warrant research. A total of 32% and 48% of Canadian general and military populations, respectively, reported experiencing physical abuse, sexual abuse and/or exposure to intimate partner violence before the age of

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**Correspondence to:** Tracie Afifi, [tracie.affi@umanitoba.ca](mailto:tracie.affi@umanitoba.ca)

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16 years,<sup>17,18</sup> and there is evidence that such abuse increases the risk for adult mental disorders and suicidality.<sup>17–23</sup> The prevalence of childhood abuse among Canadian public safety personnel is unknown; however, it is known that cumulative traumatic exposure increases the risk for mental disorders and suicidality.<sup>24–26</sup> We engaged a large sample of Canadian public safety personnel to better understand factors associated with suicidal behaviours. Our objectives were to 1) estimate the prevalence of a history of child abuse, 2) examine associations between a history of child abuse and suicidal behaviours, 3) examine associations between career-related trauma and suicidal behaviours and 4) compute the cumulative and interactive effects of a history of child abuse and career-related trauma on suicidal behaviours.

## Methods

### Data and sample

Data were drawn from an open Web-based survey (Qualtrics, <https://www.qualtrics.com/>) of Canadian public safety personnel available online from Sept. 1, 2016, to Jan. 31, 2017.<sup>2,5</sup> Survey participation was self-selected and voluntary, which made this a convenience sample. The survey modules were developed by the Canadian Institute for Public Safety Research and Treatment Team, which included the Canadian Association of Chiefs of Police, the Canadian Association of Fire Chiefs, the Canadian Association of Police Governance, the Canadian Police Association, the Correctional Service of Canada, the International Association of Fire Fighters, the Paramedic Association of Canada, the Paramedic Chiefs of Canada, the Royal Canadian Mounted Police and the Union of Solicitor General Employees, as well as the University of Regina, where one of the authors (R.N.C.) is employed. The other authors did not give input in designing the survey but were invited to collaborate with R.N.C. to design the research questions. The survey was piloted with undergraduate and graduate students before launch. Participation was solicited through emails sent by national public safety associations to currently serving members, and a link was posted on association Web sites. As well, the Minister of Public Safety and Emergency Preparedness prepared a public service announcement video that was available online. No incentives were offered for completing the questionnaire.

Respondents were given a random unique identifier to log in anonymously as often as needed to complete the survey. No identifying information was collected; therefore, there was no way of identifying unique visitors. The median time to complete the survey was 1.3 hours. Some respondents did not log out when stepping away from the computer, and therefore the range of completion times was very large and the mean was not calculated. Because there was no clear cut-off point to identify outliers, none were excluded. Data were exported directly from the Web site to an electronic database.

The survey design prohibited determining how many public safety personnel were successfully invited; therefore, we

were not able to compute a traditional response rate. Instead, we computed a completion rate, indicating the proportion of respondents who completed the questionnaire modules included in the current analyses divided by those who started the survey.

### History of child abuse

We measured a history of child abuse using 6 questions previously validated from the Childhood Experiences of Violence Questionnaire<sup>27</sup> and employed in nationally representative Canadian surveys.<sup>28,29</sup> The questions were categorized into physical abuse, sexual abuse and exposure to intimate partner violence as a child based on validated cut-offs.<sup>27</sup> Question response options included “never,” “1–2 times,” “3–5 times,” “6–10 times” or “> 10 times.” We used 3 questions to measure physical abuse: 1) “How many times did an adult slap you on the face, hand or ears, or hit or spank you with something hard to hurt you?” 2) “How many times did an adult push, grab, shove or throw something at you to hurt you?” and 3) “How many times did an adult kick, bite, punch, burn you or physically attack you in some way?” A response option of 3 times or more on questions 1 and 2, and any response other than “never” for question 3, was coded as physical abuse. Any physical abuse was coded as exposure to at least 1 of the 3 experiences based on the above coding. We measured sexual abuse using the following 2 items: “How many times did an adult force you or attempt to force you into any unwanted sexual activity by threatening you, holding you down or hurting you in some way?” and “How many times did an adult touch you against your will in any sexual way? By this, we mean anything from unwanted touching or grabbing, to kissing or fondling.” Exposure to sexual abuse was coded as any response other than “never” on either question. We measured exposure to intimate partner violence as a child using 1 item: “How many times did you see or hear any one of your parents, stepparents or guardians hit each other or another adult in the home? By adult, we mean anyone 18 years and over.” A response option of 3 times or more was coded as exposure to intimate partner violence. In addition, we computed a dichotomous measure of any child abuse that classified respondents who reported experiencing 1 or more types of abuse into the “yes” category. The number of child abuse exposures was coded as none, 1 type, or 2 or more types.

### Career-related trauma

Respondents were asked to indicate the frequency of witnessing or experiencing the following career-related traumatic events: 1) death in the line of duty, 2) serious injuries in the line of duty, 3) disaster or multiple-causality incidents, 4) incidents involving the unusual or sudden death of children or harm of children, 5) events that threatened their life or the life of a colleague, 6) incidents in which victims were relatives or friends or 7) suicide of a close colleague or superior. These questions were developed specifically for this survey. We created a dichotomous variable (yes/no) that classified respondents who reported experiencing 1 or more event into the “yes” category.<sup>30</sup>

## Suicidal behaviours

To assess suicidal ideation, plans and attempts, respondents were asked 3 questions that have been previously used in Statistics Canada surveys<sup>28,29</sup> and published in high-impact journals:<sup>6,18</sup> “Have you ever seriously contemplated suicide?” “Have you ever made a plan to attempt suicide?” and “Have you ever attempted suicide in your lifetime?”<sup>28,29,31</sup> We created 3 separate dichotomous (yes/no) variables to assess these behaviours.

## Statistical analysis

Analyses were limited to correctional workers, call centre operators/dispatchers, firefighters, municipal or provincial police, paramedics and Royal Canadian Mounted Police. First, we used cross-tabulations and logistic regression with complete case analysis to determine the sociodemographic characteristics of the sample among those with and without any child abuse exposure. Second, we used cross-tabulations to determine the frequency of each type of child abuse and any career-related trauma by public safety personnel category. We tested significant differences between each public safety personnel category using separate logistic regression models for each public safety personnel category as the reference. Third, we computed separate cross-tabulations and logistic regression models to examine the relations between each child abuse type and lifetime suicidal ideation, plans and attempt(s), adjusting for sex, age (continuous), marital status (married/common-law/remarried, single, separated/divorced/widowed), region of residence (Western Canada/territories, Eastern Canada, Atlantic Canada), ethnicity (white, other), education (some postsecondary or less, university degree/4 years of college or higher), years of service in public safety (continuous) and employment category (municipal/provincial police, Royal Canadian Mounted Police, correctional worker, firefighter, paramedic, call centre operator/dispatcher). Fourth, we tested individual and cumulative effects of trauma exposure by creating a multilevel variable of mutually exclusive categories that included those who 1) did not report experiencing any child abuse or career-related trauma, 2) reported experiencing child abuse only, 3) reported experiencing career-related trauma only or 4) reported experiencing both child abuse and career-related trauma. We used logistic regression to measure the association between this 4-level variable and suicidal ideation, plans and attempt(s). Differences between the categories were tested with separate logistic regression models, with each level of the 4-level variable as the reference. Fifth, we tested individual and interactive effects of trauma exposure using logistic regression to examine the relations between any child abuse, career-related trauma and suicidal behaviours. To determine interactive effects, we computed an interaction term between child abuse and career-related trauma, and entered it into the model with the main effects. All cumulative and interactive analyses were adjusted for sociodemographic variables. Analyses were completed with Stata version 15.0 (StataCorp).

## Ethics approval

The study was approved by the University of Regina Research Ethics Board, and informed consent was obtained online from each respondent before he or she began the survey.

## Results

In total, 8520 respondents began the survey, and 4340 progressed far enough to complete at least 1 question on the child abuse module. After we excluded people from ineligible professions, the final sample comprised 4199 respondents, for a completion rate of 49.3%. A completion rate sensitivity analysis comparing sociodemographic variables among those who had valid responses (yes/no) on the variables of interest in the current analyses indicated significant differences based on marital status and region of residence as well as for some age categories, years of service categories and public safety personnel types (Supplementary Table A1, Appendix 1, available at [www.cmajopen.ca/content/6/4/E463/suppl/DC1](http://www.cmajopen.ca/content/6/4/E463/suppl/DC1)). The percentage of missing data for each variable ranged from 0.3% to 8.7%.

Over half (2275/4073 [55.9%]) of respondents reported a history of child abuse. Specifically, 2018 (49.4%) reported physical abuse, 583 (14.1%) reported sexual abuse, and 368 (8.9%) reported exposure to intimate partner violence as a child. The sociodemographic characteristics of respondents with and without a history of child abuse are presented in Table 1. Several variables were related to increased odds of having a history of child abuse, including older age, being separated/widowed/divorced, ethnicity other than white and more years of service (odds ratio [OR] 1.02–1.60). Compared to participants living in Western Canada/territories, those living in Atlantic Canada had lower odds of having a history of child abuse (OR 0.72, 95% confidence interval [CI] 0.60–0.90). Compared to participants with less education, those who had a university degree or 4 years of college also had lower odds of having experienced child abuse (OR 0.78, 95% CI 0.70–0.90). Compared to municipal/provincial police, correctional workers and paramedics had greater odds of having a history of child abuse (OR 1.23, 95% CI 1.00–1.50, and OR 1.27, 95% CI 1.00–1.60, respectively).

Table 2 provides the prevalence of a history of child abuse and career-related trauma by public safety personnel category. Significant differences between categories were noted for all types of child abuse; however, consistent trends appeared only for correctional workers and call centre operators/dispatchers. These groups were more likely than other public safety personnel to have experienced being pushed, grabbed or shoved, or having something thrown at them, sexual abuse, and 2 or more types of child abuse. Most respondents (3947 [94.0%]) also reported experiencing career-related trauma, with correctional workers reporting the lowest prevalence (502 [84.9%]).

The relation between child abuse types and lifetime suicidal ideation, plans and attempt(s) is shown in Table 3. The prevalence of lifetime suicidal ideation, plans and attempt(s) in the current sample was 26.6% ( $n = 1118$ ), 12.7% ( $n = 534$ ) and

**Table 1: Sociodemographic variables by child abuse status in a sample of Canadian public safety personnel**

Variable	Status; no. (%) of respondents*†		OR (95% CI)
	No child abuse <i>n</i> = 1924	Child abuse <i>n</i> = 2275	
<b>Sex</b>			
Male	1222 (45.1)	1490 (54.9)	1.00
Female	570 (42.3)	778 (57.7)	1.12 (0.98–1.3)
Age, yr, mean ± SD	41.7 ± 9.3	44.5 ± 8.9	1.04 (1.0–1.0)
<b>Marital status</b>			
Married/common-law/remarried	1453 (45.5)	1741 (54.4)	1.00
Single	181 (44.1)	229 (55.9)	1.06 (0.9–1.3)
Separated/divorced/widowed	151 (34.2)	290 (65.8)	1.60 (1.3–2.0)
<b>Region of residence</b>			
Western Canada‡ and territories	962 (43.5)	1249 (56.5)	1.00
Eastern Canada§	580 (42.4)	787 (57.6)	1.05 (0.9–1.2)
Atlantic Canada¶	239 (51.6)	224 (48.4)	0.72 (0.6–0.9)
<b>Ethnicity</b>			
White	1671 (45.0)	2039 (55.0)	1.00
Other	112 (34.6)	212 (65.4)	1.55 (1.2–2.0)
<b>Education</b>			
Some postsecondary or less	1038 (41.8)	1444 (58.2)	1.00
University degree/4 yr of college or higher	714 (48.0)	774 (52.0)	0.78 (0.7–0.9)
Years of service, mean ± SD	16.6 ± 9.4	18.6 ± 9.3	1.02 (1.0–1.0)
<b>Public safety personnel category</b>			
Municipal/provincial police	497 (45.6)	594 (54.4)	1.00
Royal Canadian Mounted Police	480 (46.7)	547 (53.3)	0.95 (0.8–1.1)
Correctional workers	234 (40.6)	343 (59.4)	1.23 (1.0–1.5)
Firefighters	279 (45.1)	340 (54.9)	1.02 (0.8–1.2)
Paramedics	218 (39.6)	332 (60.4)	1.27 (1.0–1.6)
Call centre operators/dispatchers	90 (43.1)	119 (56.9)	1.11 (0.8–1.5)
Note: CI = confidence interval, OR = odds ratio, SD = standard deviation. *Except where noted otherwise. †Denominators vary as not all respondents answered all questions. ‡British Columbia, Alberta, Saskatchewan and Manitoba. §Ontario and Quebec. ¶New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador.			

4.4% (*n* = 184), respectively (data not shown). All types of child abuse were related to lifetime suicidal ideation (adjusted OR 2.09–2.63), plans (adjusted OR 2.06–2.48) and attempt(s) (adjusted OR 2.38–3.25).

Cumulative models showed significant associations between child abuse only, career-related trauma only, or both child abuse and career-related trauma and suicidal behaviours (adjusted OR 1.84–7.12) (Table 4). Experiencing child abuse only and experiencing both child abuse and career-related trauma did not have significantly different associations with suicidal behaviour. However, the association between career-related trauma only and suicidal behav-

our was significantly smaller than that for child abuse only and that for child abuse and career-related trauma together.

Table 5 presents the individual and interaction effects of career-related trauma and a history of child abuse on suicidal behaviours. Career-related trauma was significantly related to lifetime suicidal ideation and plans (adjusted OR 1.57 [95% CI 1.10–2.20] and 1.78 [95% CI 1.10–2.90], respectively). After career-related trauma was controlled for, a history of child abuse remained significantly related to lifetime suicidal behaviours (adjusted OR 2.21–2.60). After a history of child abuse was controlled for, career-related trauma was no longer significantly related to suicidal behaviours.

**Table 2: Prevalence of child abuse and career-related trauma by public safety personnel category**

Type of abuse/trauma	Category; no. (%) of respondents*							Significant differences†
	Total n = 4073	Municipal/ provincial police (a) n = 1091	Royal Canadian Mounted Police (b) n = 1027	Correctional workers (c) n = 577	Firefighters (d) n = 619	Paramedics (e) n = 550	Call centre operators/ dispatchers (f) n = 209	
Slapped on face, head or ears, or hit or spanked with something hard	1880 (46.0)	482 (44.2)	440 (42.6)	280 (48.5)	305 (48.9)	278 (50.0)	95 (45.5)	a < e b < c, d, e
Pushed, grabbed or shoved, or something thrown at him/her	831 (20.4)	205 (18.9)	198 (19.3)	144 (25.0)	121 (19.4)	104 (18.7)	59 (28.8)	a < c, f b < c, f d < c, f e < c, f
Kicked, bit, punched, choked, burned or attacked	546 (13.2)	127 (11.5)	124 (11.8)	91 (15.7)	85 (13.3)	86 (15.2)	33 (15.4)	a < c, e b < c
Any physical abuse	2018 (49.4)	523 (47.9)	477 (46.3)	296 (51.2)	326 (52.4)	295 (53.2)	101 (48.6)	a < e b < d, e
Sexual abuse	583 (14.1)	139 (12.7)	129 (12.3)	132 (22.8)	47 (7.4)	86 (15.2)	50 (23.8)	a < c, f b < c, f d < a, b, c, e, f e < f, c
Exposure to intimate partner violence	368 (8.9)	94 (8.5)	94 (9.0)	62 (10.6)	45 (7.0)	48 (8.5)	25 (11.7)	d < c, f
Any child abuse	2275 (55.9)	594 (54.4)	547 (53.3)	343 (59.4)	340 (54.9)	332 (60.4)	119 (56.9)	a < c, e b < c, e
No. of types of child abuse								
0	1798 (44.7)	497 (46.4)	480 (47.1)	234 (41.3)	279 (45.7)	218 (40.1)	90 (43.9)	c < a, b e < a, b
1	1622 (40.4)	436 (40.7)	408 (40.0)	209 (36.9)	261 (42.8)	236 (43.4)	72 (35.1)	c < d, e f < e
≥ 2	598 (14.9)	139 (13.0)	132 (12.9)	124 (21.9)	70 (11.5)	90 (16.5)	43 (21.0)	a < c, f b < c, f d < c, e, f e < c
Any career-related trauma	3947 (94.0)	95.2 (1061)	1016 (95.9)	502 (84.9)	614 (94.8)	557 (97.2)	197 (92.1)	c < a, b, d, e, f d < e f < b, e

\*Denominators vary as not all respondents answered all questions.  
†Significant differences at  $p < 0.05$  in the prevalence of a history of child abuse and any career-related trauma between different public safety personnel categories based on logistic regression analyses.

Interaction terms between career-related trauma and a history of child abuse on lifetime suicidal behaviours were not significant.

### Interpretation

In this national survey including measures of childhood physical abuse, sexual abuse and exposure to intimate partner violence among Canadian public safety personnel, there are 4 novel findings. First, 55.9% of our sample reported experiencing child abuse. Second, correctional workers and call cen-

tre operators/dispatchers had a higher prevalence of some types of child abuse than other public safety personnel. Third, all types of child abuse were significantly related to lifetime suicidal behaviour. Fourth, career-related trauma was significantly related to suicidal behaviour; however, stronger associations were seen for a history of child abuse.

Over half of our sample reported experiencing child abuse before 16 years of age. Although we were not able to statistically compare these estimates to those for the Canadian general population or military populations, the prevalence appears higher than that among the general population (32%)

**Table 3: Associations between a history of child abuse and lifetime suicidal behaviours**

Type of abuse	Suicidal ideation		Suicide plans		Suicide attempt(s)	
	No. (%) of respondents	Adjusted OR* (95% CI)	No. (%) of respondents	Adjusted OR* (95% CI)	No. (%) of respondents	Adjusted OR* (95% CI)
Slapped on face, head or ears, or hit or spanked with something hard	642 (37.0)	2.09 (1.8–2.4)	335 (19.7)	2.41 (2.0–3.0)	118 (6.9)	2.47 (1.8–3.4)
Pushed, grabbed or shoved, or something thrown at him/her	336 (44.0)	2.32 (1.9–2.8)	183 (24.4)	2.42 (2.0–3.0)	73 (9.8)	2.96 (2.1–4.1)
Kicked, bit, punched, choked, burned or attacked	227 (45.0)	2.14 (1.7–2.6)	131 (26.4)	2.42 (1.9–3.1)	52 (10.5)	2.78 (1.9–4.0)
Physical abuse	681 (36.5)	2.12 (1.8–2.5)	351 (19.1)	2.34 (1.9–2.9)	125 (6.8)	2.64 (1.9–3.7)
Sexual abuse	234 (42.5)	2.12 (1.7–2.6)	125 (23.2)	2.06 (1.6–2.7)	58 (10.6)	2.38 (1.6–3.4)
Exposure to intimate partner violence	161 (48.2)	2.63 (2.1–3.4)	85 (25.9)	2.48 (1.9–3.3)	40 (12.2)	3.25 (2.2–4.9)
Any child abuse	749 (35.6)	2.22 (1.9–2.6)	383 (18.5)	2.49 (2.0–3.1)	136 (6.5)	2.61 (1.8–3.8)

Note: CI = confidence interval, OR = odds ratio.  
\*Adjusted for sex, age, marital status, region of residence, ethnicity, education, years of service and public safety personnel category.

**Table 4: Individual and cumulative effects of a history of child abuse and career-related trauma on lifetime suicidal behaviours**

Abuse/trauma category*†	Suicidal ideation		Suicide plans		Suicide attempt(s)	
	No. (%) of respondents	Adjusted OR‡ (95% CI)	No. (%) of respondents	Adjusted OR‡ (95% CI)	No. (%) of respondents	Adjusted OR‡ (95% CI)
No child abuse/career-related trauma	16 (12.7)	1.00	NP	1.00	NP	1.00
Child abuse only	31 (31.6)	3.33§ (1.6–6.8)	16 (16.5)	5.89§ (1.9–18.5)	NP	3.98§ (1.0–15.5)
Career-related trauma only	322 (20.8)	1.84¶ (1.0–3.3)	136 (8.9)	3.00¶ (1.1–8.4)	40 (2.6)	1.51¶ (0.4–5.1)
Child abuse and career-related trauma	718 (35.8)	3.97§ (2.3–7.0)	367 (18.6)	7.12§ (2.6–19.7)	127 (6.4)	3.80§ (1.2–12.5)

Note: CI = confidence interval, NP = not presented because of insufficient sample size (i.e.,  $n < 10$ ), OR = odds ratio.  
\*Mutually exclusive categories.  
†Logistic regression was used to test for statistically significant differences between the 4-level child abuse/career-related trauma variable. Symbols indicate significant differences between categories at  $p < 0.05$ .  
‡Adjusted for sex, age, marital status, region of residence, ethnicity, education, years of service and public safety personnel category.  
§The relation between child abuse only and suicidal behaviours was not significantly different from the relation between both child abuse and career-related trauma and suicidal behaviours.  
¶The relation between career-related trauma only and suicidal behaviours was significantly different from the relation between child abuse only and suicidal behaviours and both child abuse and career-related trauma and suicidal behaviours.

and comparable to that among the military population (48%).<sup>18</sup> Correctional workers and call centre operators/dispatchers reported a higher prevalence of some types of child abuse than other public safety personnel. Correctional workers had the lowest prevalence of career-related trauma. These results suggest that tailored interventions for public safety personnel may be warranted, but replication and extension of our results are necessary. In the interim, the high prevalence of a history of various types of child abuse among all public safety personnel should be recognized, and effective initiatives promoting trauma-informed care should be supported.

We also found a strong association between a history of child abuse and suicidal ideation, plans and attempt(s). Previous studies have similarly evidenced a robust association

between a history of child abuse and suicidal behaviours in military<sup>18,32</sup> and general population<sup>17,19,23</sup> samples. This provides further support for the importance of preventing child abuse and recognizing a history of child abuse as an important factor related to suicidal behaviours. Career-related trauma was also significantly associated with suicidal behaviours, which is consistent with evidence that traumatic experiences, such as responding to a suicide attempt or death,<sup>33</sup> traumatic work-related events<sup>34</sup> or death of a fellow officer,<sup>10</sup> appear related to increased suicidal behaviour. Cumulative and adjusted logistic regression models indicated that, although career-related trauma was associated with suicidal behaviour, a history of child abuse was consistently more strongly associated with lifetime suicidal behaviours.

**Table 5: Individual and interaction effects of a history of child abuse and career-related trauma on lifetime suicide-related behaviours**

Model	Adjusted OR* (95% CI)		
	Suicidal ideation	Suicide plans	Suicide attempt(s)
1. Career-related trauma	1.57 (1.1–2.2)	1.78 (1.1–2.9)	1.22 (0.6–2.3)
2. Child abuse	2.22 (1.9–2.6)	2.49 (2.0–3.1)	2.61 (1.8–3.8)
3.			
Career-related trauma	1.43 (0.99–2.1)	1.59 (0.97–2.6)	1.10 (0.6–2.1)
Child abuse	2.21 (1.9–2.6)	2.47 (2.0–3.1)	2.60 (1.8–3.8)
4. Career-related trauma × child abuse	0.65 (0.3–1.3)	0.40 (0.1–1.3)	0.63 (0.2–2.6)

Note: CI = confidence interval, OR = odds ratio.  
 \*Models 1 and 2: adjusted for sex, age, marital status, region of residence, ethnicity, education, years of service and public safety personnel category; model 3: adjusted for the same variables as in models 1 and 2 with the addition of career-related trauma and child abuse in the same model; model 4: adjusted for the same variables as in model 3 with the main effects of career-related trauma and child abuse in addition to the interaction term for career-related trauma × child abuse.

### Strengths and limitations

Strengths of our study include a large, diverse Canadian public safety personnel sample, which presented a comprehensive picture of the relations between a history of child abuse, career-related trauma and suicidal behaviours and facilitated comparisons across multiple public safety personnel categories. However, our results are subject to several limitations. First, cross-sectional data prohibit causal inferences. Second, the measure of child abuse was limited to experiences before the age of 16 years, but suicidal behaviour was measured over the lifetime, prohibiting discussions of temporality. Third, participation was voluntary, self-selected and online, and the data were retrospective, potentiating recall and response biases. The survey used a convenience sample — that is, potential participants were invited to participate through widely distributed emails and public service announcements — and thus we are unable to determine the exact number who were successfully invited to participate and cannot compute a traditional response rate. Fourth, the low completion rate increases the possibility of response bias; however, the completion rate sensitivity analysis indicated significant differences on only a few variables. Fifth, the length of the survey may have contributed to respondent burnout and a reduced completion rate. Sixth, we did not adjust for several residual confounders, including, but not limited to, parental mental disorders, child poverty, access to health care, respondents' current or previous mental disorders and social support. Seventh, because we did not assess the frequency of suicidal behaviour, we do not know the persistence or severity of suicidality. Finally, the career-related trauma questions were designed specifically for this survey and have not been validated.

### Conclusion

The high prevalence of a history of child abuse among a large sample of Canadian public safety personnel signals the need for stronger strategies to prevent child abuse and positive parenting interventions. Both a history of child abuse and career-

related trauma were significantly related to suicidal behaviours; however, the relations were stronger for the former. Reducing child abuse may also reduce suicidal ideation, plans and attempts among Canadian public safety personnel. Our findings are important for developing effective treatment and intervention strategies aimed at reducing suicide among public safety personnel.

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**Affiliations:** Departments of Community Health Sciences (Turner, Sareen, Afifi), Psychiatry (Turner, Sareen, Afifi) and Psychology (Sareen) and the Applied Health Sciences Program (Taillieu), University of Manitoba, Winnipeg, Man.; Department of Psychology (Carleton), University of Regina, Regina, Sask.

**Contributors:** Sarah Turner, Tamara Taillieu, Nicholas Carleton and Tracie Afifi conceived the study and contributed to the study design. Sarah Turner and Tamara Taillieu analyzed the data, supervised by Nicholas Carleton and Tracie Afifi. Jitender Sareen provided feedback on the analytical approach. Sarah Turner drafted the manuscript, and Tamara Taillieu, Nicholas Carleton, Jitender Sareen and Tracie Afifi critically revised it for important intellectual content. All of the authors contributed to data interpretation, gave final approval of the version to be published and agreed to be accountable for all aspects of the work.

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