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Evaluating the Before Operational Stress on-demand asynchronous online training for public safety and healthcare personnel

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ABSTRACT

Background: Public safety personnel (PSP) experience frequent exposures to potentially psychologically traumatic events, increasing their likelihood of developing several mental health disorders. The Before Operational Stress (BOS) program was designed as a proactive psychological intervention to build resilience and improve interpersonal relationships among Canadian PSP. Previous mixed-methods evaluations of the BOS program evidenced small but statistically significant improvements associated with BOS Intensive (in-person) training. A new delivery modality was developed to provide asynchronous online access to program content (i.e., BOS On-Demand) to improve accessibility.
Objective: The current study was designed to assess the impact of BOS On-Demand with data from a large sample of PSP ($n = 9295$; $n = 636$ [56.1% female] completed all surveys).
Methods: Participants were administered a self-report survey at pre-training, post-training, and at a 3-month follow-up. Multilevel modeling was used to assess differences in outcome measure changes across timepoints.
Results: BOS On Demand was associated with several small, but statistically significant, improvements sustained at follow-up, including decreased stress (post-training, $p \leq .001$, Cohen's $d = -0.15$; follow-up, $p \leq .01$, Cohen's $d = -0.19$), as well as increased mental health knowledge (pre-training, $p \leq .01$, Cohen's $d = 0.13$; follow-up, $p \leq .001$, Cohen's $d = 0.34$).
Conclusion: The current study provides the first evaluation of the BOS On-Demand program, evidencing encouraging improvements across several measures of mental health.

1. Introduction

Canadian public safety personnel (PSP; e.g., border service agents, correctional workers, firefighters, paramedics, police officers, public safety communicators) and frontline healthcare personnel (HCPs; e.g., nurses) play a crucial role in ensuring the safety and security of Canadians (Mendicino & Blair, 2022; Oliphant, 2016). PSP and HCPs are frequently exposed to potentially psychologically traumatic events (PPTE) involving direct or indirect exposures to actual or threatened death, serious injury, or sexual violence (Carleton et al., 2019). Most PSP and nurses have reported having been exposed to diverse PPTE types, with each PPTE type experienced 11 or more times (Carleton et al., 2019; Stelnicki, Jamshidi, Ricciardelli et al., 2021), whereas most of the general population will be exposed to fewer than five PPTE during their lifetime (Benjet et al., 2016; Kilpatrick et al., 2013). Such frequency of exposure increases risk for PSP and HCPs to develop posttraumatic stress disorder (PTSD) (American Psychiatric Association, 2022) and other mental health disorders, collectively referred to as posttraumatic stress injuries (PTSI) (Heber et al., 2023). Nearly half of PSP (44.5 %; (Carleton et al., 2018)) and nurses (47.9 %; (Stelnicki & Carleton, 2021) screen positive for one or more mental health disorders, a proportion much higher than the general population (10 %; (Statistics Canada, 2012) indicating urgent need for evidence-based mental health programs tailored to support PSP and HCPs in mitigating the effects of PTSI (Public

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Health Agency of Canada, 2019).

There are mental health programs designed to improve peer support among public safety and healthcare workplaces by training PSP and HCWs to provide mental health support to their peers (Anderson et al., 2020). There are also mental health programs for PSP designed to improve short-term performance, and mitigate the negative long-term mental health challenges (Di Nota et al., 2021). The extant programming includes options designed specifically to build and strengthen psychological resilience among PSP (Di Nota et al., 2021).

Despite the propagation of resilience training programs, very few are implemented according to their intended guidelines, and evidence supporting the effectiveness of these programs is extremely limited (Anderson et al., 2020; Di Nota et al., 2021). Additionally, PSP have reported feeling that some external mental health supports are insufficient for their needs (Ford-Jones & Daly, 2020; Lentz et al., 2022), and expressed the need for tailored programs and approaches to mental health support (Lentz et al., 2022; Wild et al., 2020).

The Before Operational Stress (BOS) program was designed by Dr. Megan McElheran and Wayfound Mental Health Group to provide evidence-informed mental health training to PSP. The BOS training is designed to be a proactive intervention for PSP and HCP, intending to give participants knowledge and tools for recognizing and understanding symptoms, and empowering participants with knowledge about navigating operational stress (McElheran & Stelnicki, 2021). The program content is based on cognitive behavioral therapy (CBT) and combines theoretical and experiential learning procedures to improve PSP resilience, interpersonal relationships, and mitigate the effects of occupational stressors on PSP mental health (McElheran & Stelnicki, 2021). The content is designed to be administered over 8 weeks, through eight different modules covering operational service culture, physiology of operational stress, markers of operational stress, cognitive impacts, emotions, behaviour change, communication, empathy, and functional disconnection and reconnection (McElheran & Stelnicki, 2021). Each module is facilitated by a registered clinical psychologist with didactic components focused on improving PSP self-awareness and encouraging authentic, healthy relationships (Stelnicki, Jamshidi, Fletcher et al., 2021). Building and maintaining healthy authentic relationships is particularly important for PSP, as spouses and friends appear crucial for promoting PSP mental health (Carleton et al., 2020).

The original BOS program was delivered via in-person groups, facilitated by a registered trained clinician (i.e., BOS Intensive); however, program offerings have subsequently expanded to include virtual options, such as clinician-facilitated virtual groups (i.e., BOS Classroom), as well as an individual self-paced version of the program (i.e., BOS On-Demand) (McElheran & Stelnicki, 2021). BOS Intensive has been associated with small, but statistically significant improvements in PTSD symptoms, quality of life, social support, and mental health stigma (Stelnicki, Jamshidi, Fletcher et al., 2021). The relatively small sample size ($n = 136$) of previous research may have been inadequate to detect other effects associated with BOS Intensive, particularly for measures with high interindividual variability (e.g., resiliency, mental health stigma) (Stelnicki, Jamshidi, Fletcher et al., 2021). Nevertheless, initial results were promising and included recommendations for additional research with larger samples. A later study also evaluated differences between the Intensive and Virtual BOS training programs and found that the two delivery modalities were associated with similar outcomes, particularly concerning reductions in emotional regulation difficulties and anxiety symptoms (Ioachim et al., 2024)

Increasingly complex logistical requirements for program delivery, particularly after the onset of COVID-19 (Heber et al., 2020) required the development of more flexible delivery modalities to accommodate the unique operational needs of PSP. Several research studies highlighted the necessity and nuance of online mental health education post COVID-19 (Barrett & Stewart, 2021; Hadjistavropoulos et al., 2021; Thew et al., 2022; Weiner et al., 2020). The new BOS On-Demand modality allowed participants to complete the training asynchronously at their own pace using pre-recorded videos and exercises, with participants encouraged to maintain a one module per week pace. BOS On-Demand is available in English or French. Intervention and training programs, such as BOS, that can be delivered proactively may be an important component to supporting PSP and HCP mental health throughout their careers.

The current study was designed to evaluate the effectiveness of BOS On-Demand as provided to a large sample of diverse PSP. The current study is the first evaluation of BOS On-Demand owing to the recent development and launch of the asynchronous modality. A longitudinal design was used to assess changes in self-reported mental health symptoms, quality of life, social support, and mental health stigma, from pre- to post-training, and at a 3-month follow-up. Hypotheses for the current study were based on extant research related to BOS training (Ioachim et al., 2024; Ioachim et al., 2025; Stelnicki, Jamshidi, Fletcher et al., 2021). BOS On-Demand was expected to be associated with small, but statistically significant 1) reductions in PTSD symptoms and mental health stigma; 2) reductions in symptoms of anxiety, depression, stress, and substance use; 3) increases in perceived social support; 4) increases in mental health literacy; 5) increases in the willingness to use mental health resources; and 6) sustained changes at a 3-month follow-up.

2. Materials and methods

2.1. Procedure

The current study was approved by the University of Regina Institutional Research Ethics Board (2022–33). All participants provided written informed consent to participate in the study. The study sample was comprised of professionals from several different PSP and healthcare sectors. Upon enrollment, PSP receiving BOS On-Demand training were invited to participate in the research study through a link to the consent form and the first survey. Participation was voluntary, confidential, and did not affect participant eligibility for BOS On-Demand training. Participant information was kept confidential from the Wayfound Mental Health Group. Post-training and follow-up surveys were distributed via pre-scheduled emails and participants could withdraw from the study at any time. Surveys were administered at pre-training (i.e., immediately before starting BOS On-Demand), post-training (i.e., 8 weeks after pre-training to allow participants to complete all modules at the recommended pace), and at a 3-month post-training follow-up. Participants were sent a reminder email 3 days after initial contact for each data collection timepoint. Surveys were available in English and French.

2.2. Sample and data

Participant sociodemographic characteristics are presented in Table 1. A total of 9295 participants responded to pre-training surveys, of which only 636 (6.36 %) participants completed at least the pre-training and post-training surveys. Only participants who provided data for at least these two assessment timepoints have been included in subsequent analyses. Most survey participants were female (56.1 %; $n = 357$), Caucasian (84.1 %; $n = 535$), and 40–49 years old (36.9 %; $n = 235$), 30–39 years old (23.4 %, $n = 149$), or 50–59 years old (24.4 %, $n = 155$). Participants were from Western Canada (45.6 %, $n = 290$), Eastern Canada (42.1 %; $n = 268$), and Atlantic Canada (6.1 %; $n = 39$). PSP sector representation included police (22.5 %, $n = 143$), firefighters (12.3 %, $n = 78$), paramedics (10.7 %; $n = 68$), and healthcare workers (9.0 %, $n = 57$). Almost all participants (i.e., 81.6 %) completed the training at the recommended 1–2 modules per week pace, with 20.7 % of participants completing the training in fewer than 50 days, and 7.7 % of participants completing the training in fewer than 28 days.

Table 1
Demographic measures for BOS On-Demand participants.

	BOS On-Demand participants % (n)
Gender	
Man	41.4(263)
Woman	55.8(355)
Other	0.9(6)
Sex	
Male	41.5(264)
Female	56.1(357)
Other	^
Age	
18–29	8.5(54)
30–39	23.4(149)
40–49	36.9(235)
50–59	24.4(155)
60+	4.4(28)
Ethnicity	
Asian	3.8(24)
Black	1.6(10)
First Nations/ Inuit/ Metis	2.8(18)
Hispanic	^
Middle Eastern	^
White/Caucasian	84.1(535)
Other	3.3(21)
Province of residence	
Western Canada (AB, BC< MB, SK)	45.6(290)
Eastern Canada (ON, QC)	42.1(268)
Atlantic Canada (NB, NFL, NS, PEI)	6.1(39)
Northern Territories (NVT, NWT, YK)	1.3(8)
PSP Sector	
Border Services	2.7(17)
Corrections (federal, provincial)	5.2(33)
Public Safety Communications	3.3(21)
Firefighters (career, volunteer)	12.3(78)
Healthcare Workers	9.0(57)
Paramedics	10.7(68)
Police (municipal, provincial)	22.5(143)
RCMP	8.6(55)
Search and Rescue	2.0(13)
Social workers	2.5(16)
Other	19.2(122)

Note: Cells marked '^' contained five or fewer responders and were masked to avoid potentially identifying information.

2.3. Self-report measures

Assessment measure selection was designed to allow for comparisons with prior BOS program evaluations (Stelnicki, Jamshidi, Fletcher et al., 2021). All measures were administered across each timepoint (i.e., pre-training, post-training, follow-up) except for sociodemographic items at pre-training, and an author-created scale assessing the use of BOS skills administered at post-training and follow-up.

2.3.1. PTSD Checklist-5 Short Form (PCL-5-SF)

The PCL-5-SF (PCL-5-SF; Zuromski et al., 2019), derived from the 20-item PCL-5 (Weathers, Litz et al., 2013), is a 4-item measure of how bothered the respondent is by PTSD symptoms in the past month. Participants rate each item on a 5-point Likert-type scale ranging from 0 ("*not at all*") to 4 ("*extremely*"). Higher scores indicate a greater prevalence of PTSD symptoms. The PCL-5-SF has demonstrated strong reliability as well as structural, convergent, and discriminant validity (Blevins et al., 2015). In accordance with the Diagnostic and Statistical Manual of Mental Disorders, 5th edition-Text Revision (American Psychiatric Association, 2022) participants indexed their exposures to a specific list of PPTEs provided in the Life Events Checklist for the DSM-5 (Weathers, Blake et al., 2013) prior to completing the PCL-5-SF.

2.3.2. Depression, anxiety, and Stress Scale-21 (DASS-21)

The DASS-21 (DASS-21; Lovibond & Lovibond, 1995) is a 21-item measure designed to assess levels of depression, anxiety, and stress using three 7-item subscales. The current study only administered the stress subscale (items 1, 6, 8, 11, 12, 14, 18). Participants rate each item on a 5-point scale ranging from 0 ("*did not apply to me at all*") to 4 ("*applied to me very much or most of the time*"). The DASS-21 has demonstrated satisfactory internal consistency, as well as construct, convergent, and discriminant validity (Henry & Crawford, 2005). The DASS-21 also features a depression subscale and anxiety subscale, both of which were omitted to facilitate more direct comparisons to prior BOS-related research studies (Ioachim et al., 2024).

2.3.3. Patient Health Questionnaire (PHQ-4)

The PHQ-4 (PHQ4; Kroenke et al., 2009) is a 4-item measure of anxiety and depression derived from the PHQ-9 (Kroenke et al., 2001). Participants rate each item on a 4-point scale ranging from 0 ("*not at all*") to 3 ("*nearly every day*"), with higher scores indicating higher levels of anxiety and depression. The PHQ-4 has demonstrated satisfactory internal reliability, construct validity, and factorial validity (Kroenke et al., 2009).

2.3.4. Alcohol use disorders identification test – consumption (AUDIT-C)

The AUDIT-C (AUDIT-C; Bush et al., 1998) is a 3-item measure derived from the 10-item AUDIT (Saunders et al., 1993). The scale is designed to measure alcohol-use behaviors in individuals with active abuse, dependence, or heavy drinking. Participants rate the first item on a 5-point scale ranging from 0 ("*never*") to 4 ("*6 or more times a week*"), with higher scores indicating more alcohol use during the past year. Participants rate the second item on a 6-point scale ranging from 0 ("*0 drinks*") to 4 ("*10 or more drinks*") with higher scores indicating the number of alcoholic drinks during a typical day. Participants rate the third item on a 5-point scale ranging from 0 ("*never*") to 4 ("*daily or almost daily*") with higher scores indicating more hazardous alcohol use. The AUDIT-C has demonstrated satisfactory internal consistency and concurrent validity (Peng et al., 2012; Reinert & Allen, 2002).

2.3.5. Cannabis use disorders identification test – revised (CUDIT-R)

The CUDIT-R is an 8-item self-report measure designed to assess cannabis use and misuse (CUDIT-R; Adamson et al., 2010). Participants rate each item on a 5-point scale ranging from 0 ("*never*") to 4 ("*daily or almost daily*"), with higher scores indicating more severe cannabis use. The CUDIT-R has shown satisfactory internal consistency and discriminant validity (Adamson et al., 2010), as well as satisfactory sensitivity and specificity for identifying problematic use (Guillem et al., 2011; Schultz et al., 2019).

2.3.6. Brief resiliency scale (BRS)

The BRS is a 6-item self-report scale measuring self-perceptions of personal resilience. Participants rate each item on a 5-point scale ranging from 1 ("*strongly disagree*") to 5 ("*strongly agree*"), with higher scores signifying higher levels of resilience (Smith et al., 2008). The BRS has demonstrated satisfactory internal consistency and test-retest reliability (Windle et al., 2011).

2.3.7. Social provisions scale (SPS10)

The SPS10 is a 10-item self-report measure measuring the degree of social support experienced by an individual (SPS10; Cutrona & Russell, 1987). Participants rate each item on a 4-point scale ranging from 1 ("*strongly disagree*") to 4 ("*strongly agree*"). Higher scores indicate a greater level of social support. The SPS10 has demonstrated satisfactory reliability and convergent validity (Gottlieb & Bergen, 2010).

2.3.8. Mental health knowledge schedule (MAKS)

The MAKS is a 15-item measure for knowledge of and attitudes toward mental health problems (MAKS; Evans-Lacko et al., 2010). The first 6 items are included in the current study and evaluate knowledge of mental health (e.g., People with severe mental health problems can fully recover; Medication can be an effective treatment for people with

mental health problems). Participants rate each item on a 5-point scale from 1 ("*disagree strongly*") to 5 ("*agree strongly*"), with higher scores indicating greater mental health literacy. The MAKS has demonstrated satisfactory reliability and face validity (Evans-Lacko et al., 2010).

2.3.9. Open minds survey of workplace attitudes (OMSWA)

The OMSWA is a 9-item scale measuring stigmatizing attitudes in the workplace (OMSWA; Boehme et al., 2019). Participants rate each item on a 5-point scale from 1 ("*strongly disagree*") to 5 ("*strongly agree*"). Higher scores are associated with more stigmatizing attitudes toward mental health conditions in the workplace. The scale produces a total score as well as subscale scores for 1) attitudes predicting avoidance and 2) beliefs about danger and unpredictability. The OMSWA has demonstrated satisfactory factor reliability and factor validity (Boehme et al., 2022).

2.3.10. Self-Care and mental health access scale (SCMHA)

The SCMHA is a 25-item scale measuring environmental support available to PSP (Carleton, Duranceau & LeBouthilier, 2016; unpublished scale). The current study only used the Personal Support subscale (items 1–10) to measure access to support resources (i.e. spouse, friend, psychologist). Participants rate each item on a 7-point scale from 1 ("*I can and would access as an early resource*") to 7 ("*I don't know if I have access*"), with higher scores indicating lower levels of access. The SCMHA is a new measure with psychometrics pending; for more information see Carleton et al. (2022).

2.3.11. Mental health services use questionnaire (MHSUQ)

The MHSUQ is a 4-item measure for willingness to seek mental health resources (MHSUQ; Zamorski et al., 2016). Participants rate each item on a 7-point scale from 1 ("*strongly agree*") to 7 ("*strongly disagree*"). Higher scores indicate a greater willingness to seek mental health services. The MHSUQ is consistent with questions regularly used in Statistics Canada surveys to assess mental health service use (Krakauer et al., 2020).

2.3.12. Before operational stress feedback (BOS feedback)

The BOS Feedback measure is a 3-item author-created scale measuring the value of the BOS program (i.e. How important was the training to you?; How likely are you to implement the skills learned in training?; How confident are you that you can implement skills learned in training?). Participants rate each item on a 5-point scale ranging from 0 ("*not at all important*") to 4 ("*extremely important*"), with higher scores indicating greater value assigned to the training.

2.3.13. Before operational stress skills (BOS skills)

The BOS Skills measure is an author-created scale assessing the 14 key skills taught by the BOS program, which span four broad categories: Cognitive, behavioural, awareness and regulation, and practical skills. Participants are asked to report which of the 14 skills they have used (i.e., "Which of the following skills have you employed from the BOS program?") with a dichotomous response of 0 ("*no*") or 1 ("*yes*"). Participants are then asked how often they implemented BOS Skills to support coping on a 4-point scale ranging from 0 ("*not at all*") to 4 ("*daily*"). Participants are also asked how often they have engaged with the participant workbook on a single item 4-point scale ranging from 0 ("*not at all*") to 4 ("*daily*").

2.4. Statistical analyses

Table 1 presents sociodemographic information from participants who responded to both the pre-training and post-training surveys. Tables 2 and 3 present summaries of participant responses to the BOS Feedback questions and the BOS Skills questions using proportion tests used to determine whether there are any significant differences in the proportions of respondents over time. The proportion tests were carried out independently for each response option to the BOS Skills and BOS Feedback questions and were adjusted using Bonferroni corrections for multiple pairwise comparisons. Bonferroni corrected post-hoc tests were carried out and are noted in the 'post-hoc' column of the tables. Table 4 provides means and standard deviations for all self-report mental disorder scales across time.

Multi-level modelling was applied to examine changes in outcome measures across timepoints. The multi-level modelling approach provides accurate estimates when dealing with unbalanced datasets that include missing timepoints for some individuals (Heck et al., 2013; West

Table 2
Perceptions of BOS program at pre-training, post-training, and at 3-month follow-up for participants receiving BOS On-Demand program.

	Participants at pre-training (n = 636)[1]		Participants at post-training (n = 636)[1]		Participants at 3-month follow-up (n = 124)[1]	
	% (n)	*Post-hoc*	*% (n)*	*Post-hoc*	*% (n)*	*Post-hoc*
How important is this training to you?						
(1) Not at all important	^		^		^	
(2) A little important	4.9 $(31)_a$		2.0 $(13)_a$		^	
(3) Somewhat important	25.5 $(162)_a$	n/a	15.1 $(96)_b$	(2)< (3), p<.001	12.9 $(16)_b$	
(4) Very important	42.0 $(267)_a$		35.7 $(227)_a$		51.6 $(64)_a$	(3)< (4), p<.001
(5) Extremely important	21.4 $(136)_a$		25.8 $(164)_b$	(2)< (5), p<.001	31.5 $(39)_{a,b}$	
How likely are you to implement the skills learned in training?						
(1) Not at all likely	^		^		^	
(2) A little likely	3.1 $(20)_a$		2.4 $(15)_a$		^	
(3) Somewhat likely	19.7 $(125)_a$	n/a	12.6 $(80)_a$	n/a	20.2 $(25)_a$	n/a
(4) Very likely	50.0 $(318)_a$		41.4 $(263)_a$		53.2 $(66)_a$	
(5) Extremely likely	20.8 $(132)_a$		22.3 $(142)_a$		22.6 $(28)_a$	
How confident are you that you can implement skills learned in your training?						
(1) Not at all confident	1.1(7) $_a$		^		^	
(2) A little confident	6.6 $(42)_a$		4.7 $(30)_a$		7.3 $(9)_a$	
(3) Somewhat confident	30.3 $(193)_a$	n/a	28.0 $(178)_a$	n/a	37.9 $(47)_a$	n/a
(4) Very confident	42.5 $(270)_a$		32.9 $(209)_a$		40.3 $(50)_a$	
(5) Extremely confident	13.4 $(85)_a$		13.4 $(85)_a$		12.9 $(16)_a$	

Note: Values in the same row and sub table not sharing the same subscript are statistically significantly different at p<.05 in the two-sided test of equality for column proportions, adjusted for pairwise comparisons with a Bonferroni correction.

[1] Percentages for the pre-training and post-training samples are based on the total number of participants who completed the program (i.e., at least pre-training and post-training surveys; n = 636). Total percentages for 3-month follow-up are based on the total number of participants who completed the 3-month follow-up survey (n = 124). Total percentages may not sum to 100 and *ns* may not sum to 636 (pre-training and post-training) and 124 (3-month follow-up) due to non-response or responding "other." Cells marked "^" contained five or fewer responders and were masked to avoid potentially identifying information.

Table 3
BOS Skills use at post-training and 3-month follow-up.

	Participants at post-training (n = 636)		Participants at 3-month follow-up (n = 124)	
	% (n)	*Post-hoc*	*% (n)*	*Post-hoc*
How often have you employed the skills you learned to support coping?				
(1) Daily	15.1 (96)$_a$		21.0 (26)$_a$	
(2) Weekly	39.5(251)$_a$	n/a	47.6 (59)$_a$	n/a
(3) Monthly	14.6 (93)$_a$		25.8 (32)$_a$	
(4) Not at all	5.7(36)$_a$		3.2 (4)$_a$	
How often have you engaged with the participant workbook?				
(1) Daily	1.1(7)$_a$		^	
(2)Weekly	9.9(63)$_a$	n/a	1.6(2)$_b$	(2)<(3), p<.001
(3) Monthly	11.5(73)$_a$		20.2 (25)$_a$	(2)<(4), p<.001
(4) Not at all	53.1(338)$_a$		77.4 (96)$_a$	
Which of the following skills have you employed from the BOS program?				
Cognitive Skills				
(1) Cognitive restructuring	6.0 (38)$_a$	n/a	33.1 (41)$_a$	n/a
(2) Naming emotions	7.7 (49)$_a$		47.6 (59)$_a$	
Behavioural Skills				
(1) Decatastrophizing	7.1 (45) $_a$		48.4 (60)$_a$	
(2) Opposite action	8.6 (55)$_a$		50.0 (62)$_a$	
(3) In-vivo exposure	0.8 (5)$_a$	n/a	1.6 (2)$_a$	n/a
(4) Gradual exposure	2.5 (16)$_a$		13.7 (17)$_a$	
(5) Functional disconnection	7.4 (47)$_a$		29.8 (37)$_a$	
(6) Functional reconnection	7.5 (48)$_a$		33.1 (41)$_a$	
Awareness and Regulation Skills				
(1) Self-monitoring with the window of tolerance	12.6 (80)$_a$	n/a	67.7 (84)$_a$	n/a
(2) Creating markers of arousal using the window of tolerance	3.3 (21)$_a$		19.4 (24)$_a$	
Practical skills				
(1) Journaling	2.2 (14)$_a$		21.0 (26)$_b$	(1)<(2), p<.001
(2) Breathing exercises	11.2 (71)$_a$	n/a	79.0 (98)$_a$	(2)>(3), p<.001
(3) Communication skills	10.0 (64)$_a$		48.4 (60)$_a$	(2)>(4), p<.001
(4) Developing rituals	5.3 (34)$_a$		27.4 (34)$_b$	(3)>(4), p<.001

Note: Values in the same row and sub table not sharing the same subscript are statistically significantly different at p<.05 in the two-sided test of equality for column proportions, adjusted for pairwise comparisons with a Bonferroni correction.. Percentages for the post-training sample are based on the total number of participants who completed the program (i.e., at least pre-training and post-training; n = 636. Total percentages for the 3-month follow-up are based on the total number of participants who completed the 3-month follow-up survey (n = 124). Total percentages may not sum to 100 and ns may not sum to 636 (post-training) and 124 (3-month follow-up) due to non-response or responding "other." Cells containing "^" represent five or fewer participants.

et al., 2015) and facilitated comparisons with previous BOS evaluations. Model fits were estimated using restricted maximum likelihood (REML) via the MIXED command in SPSS Version 28. To start, a two-level linear model was used, which included a fixed effect for Time (i.e., pre-training, post-training, follow-up), a random intercept and random slope for Time at the individual-level, and the first order autocorrelation structure for the within inidividual covariance structure at the repeated-measures level. The random slope for Time was removed from the model due to non-convergence with model fit, consistent with previous evaluations of the BOS program using the same model criteria (Ioachim et al., 2024; Stelnicki, Jamshidi, Fletcher et al., 2021). The final model (see Table 5) consisted of a fixed effect for Time, a random intercept at the individual level, and the autocorrelation structure at the repeated measures level.

Standardized effect sizes and intraclass correlations (ICCs) were calculated manually using the estimates of fixed and random effects obtained from the final models. Standardized effect sizes were calculated for each fixed effect using pooled variance estimates (Pustejovsky et al., 2014; Westfall et al., 2014). Standardized effect sizes can be interpreted using guidelines for Cohen's d, which categorize 0.20 as a small effect, 0.50 as a medium effect, and 0.80 as a large effect (Pustejovsky et al., 2014). ICCs were calculated for each applicable outcome measure using the between individual (random intercept) variance estimate and residual variance estimate from an empty random intercept model. The empty random intercept model for each outcome measure consisted of a random intercept at the individual level, and no fixed effects, estimated with restricted maximum likelihood. ICCs provide an estimate of the proportion of variance attributable to individual differences without model predictors (Hox & De Leeuw, 2003; Raudenbush & Bryk, 2002).

All included measures were based on a-priori hypotheses developed from prior research evaluations of the BOS Intensive and BOS Classroom modalities and program structure. All included measures are considered complementary and independently plausible; accordingly, interpretations of independent associations within the context of the extant literature do not inherently increase the risk of a type I error from multiple comparisons.

3. Results

As presented in Table 5, there were statistically significant (ps<0.05) decreases with small effect sizes at post-training for self-reported symptoms of stress (DASS21-Stress; d = −0.15), generalized anxiety disorder (PHQ4-Anxiety; d = −0.10), major depressive disorder (PHQ4-Depression; d = −0.09), hazardous alcohol use (AUDIT-C; d = −0.06), and stigma regarding the danger and unpredictability of people with mental health challenges (OMSWA-Danger; d = −0.09). Associated statistically significant increases with a small effect size for mental health knowledge (MAKS; d = 0.13) were observed at post-training relative to pre-training.

At 3-months follow-up, when compared to pre-training levels, there was a statistically significant decrease with a small effect size for self-reported symptoms of stress (DASS21-Stress; p<.05; d = −0.19) and a statistically significant decrease with a moderate effect size increase for self-reported mental health knowledge (MAKS; p<.05; d = 0.34). Additional statistically significant reductions (ps<0.05) with small effect sizes were observed in self-reported symptoms of hazardous cannabis use (CUDIT; d = −0.22), and reticence accessing or unawareness of the availability of mental health resources (SCMHA; d = −0.12) at 3-month follow-up when compared to pre-training levels.

Random effects (between-person variance at baseline and within-person variance) were statistically significant for most scales (ps<0.001), suggesting a high amount of variance existed between participants, as well as within participants, across timepoints. Most outcome measures had medium to high intraclass correlation values, suggesting that a high proportion of total variance in outcome measures was due to within individual differences.

The proportion of participants who described the BOS On-Demand training program as "*somewhat important*" decreased statistically significantly from pre-training to post-training (p<.05), and from pre-training to follow-up (p<.05). Conversely, a statistically significant (p<.05) increase in the proportion of participants describing BOS On-Demand as "*extremely important*" was evidenced from pre-training to post-training (see Table 2), suggesting that exposure to the training increases positive perceptions of the training. There were also statistically significant (p<.05) participant-reported increases in the use of journaling (i.e., 2.2 % to 21.0 %) and breathing exercises (i.e., 11.2 % to 79.0 %) from post-training to follow-up (Table 3). Most participants reported employing BOS skills on a weekly basis at post-training (i.e., 39.5 %) and follow-up (i.e., 47.6 %), but the apparent increase over time was not statistically significant.

Table 4
Descriptive statistics for scale total scores.

	Pre-training (n = 636)				Post-training (n = 636)				3-month Follow-up (n = 124)			
Variable	%	(n)	M	(SD)	%	(n)	M	(SD)	%	(n)	M	(SD)
DASS21-Stress	95.3	(606)	4.17	(3.70)	82.7	(526)	4.20	(3.63)	100.0	(124)	3.98	(3.49)
PHQ4-Tot	94.7	(602)	14.23	(10.22)	82.2	(523)	12.85	(9.12)	100.0	(124)	12.53	(8.19)
PHQ4 Anx	94.8	(603)	3.40	(3.18)	82.1	(522)	3.07	(2.98)	100.0	(124)	3.32	(2.79)
PHQ4 Dep	95.0	(604)	1.89	(1.78)	82.1	(522)	1.71	(1.64)	100.0	(124)	1.89	(1.52)
PCL5-SF4	95.3	(606)	1.50	(1.70)	82.2	(523)	1.35	(1.63)	100.0	(124)	1.44	(1.58)
AUDIT-C	82.1	(522)	3.47	(2.20)	70.0	(445)	3.34	(2.18)	75.8	(94)	3.31	(1.92)
CUDIT	24.7	(157)	6.20	(5.45)	19.3	(123)	6.83	(6.17)	23.4	(29)	4.59	(5.30)
BRS	92.8	(590)	3.49	(0.81)	81.6	(519)	3.49	(0.83)	99.2	(123)	3.49	(0.85)
SPS10	94.2	(599)	33.43	(5.71)	80.2	(510)	32.99	(5.81)	99.2	(123)	33.46	(5.43)
SCMHA	94.2	(599)	23.97	(2.77)	80.0	(509)	24.30	(2.55)	100.0	(124)	24.97	(2.45)
MAKS	93.1	(592)	15.22	(5.09)	79.7	(507)	14.96	(5.21)	98.4	(122)	14.75	(5.12)
MHSUQ	93.4	(594)	7.43	(2.78)	79.9	(508)	7.42	(2.93)	99.2	(123)	7.20	(2.80)
OMSWA9 - Tot	94.0	(598)	7.83	(2.92)	79.9	(508)	7.55	(2.89)	99.2	(123)	7.54	(3.00)
OMSWA - Avd	88.8	(565)	22.52	(8.39)	76.6	(487)	22.70	(8.51)	95.2	(118)	21.81	(7.20)
OMSWA - Dng	93.7	(596)	23.86	(5.08)	79.1	(503)	24.11	(4.85)	99.2	(123)	24.12	(5.34)

Notes: Percentages for the post-training sample are based on the total number of participants who completed the program (i.e., at least pre-training and post-training; n = 636. Total percentages for the 3-month follow-up are based on the total number of participants who completed the 3-month follow-up survey (n = 124). Total percentages may not sum to 100 and ns may not sum to 636 (post-training) and 124 (3-month follow-up) due to non-response or responding "other." DASS-21-Stress, Depression, Anxiety, and Stress Scale- Stress Subscale;PHQ4, Patient Health Questionnaire (total score and anxiety and depression subscales); PCL5-SF4, Posttraumatic Stress Disorder Checklist for DSM-5 Short Form; AUDIT-C, Alcohol Use Disorders Identification Test; CUDIT, Cannabis Use Disorders Identification Test; BRS, Brief Resilience Scale; SPS-10, Social Provisions Scale; SCMHA; Self-Care and Mental Health Access Scale; MAKS, Mental Health Knowledge Schedule; MHSUQ; Mental Health Services Use Questionnaire, OMSWA, Opening Minds Survey for Workplace Attitudes (total score and subscale for attitudes predicting avoidance and beliefs about danger and unpredictability).

4. Discussion

The current study evaluated the impact of delivering BOS On-Demand to a diverse sample of PSP and HCP, and was the first evaluation of the asynchronous version of the BOS training program. As expected, BOS On-Demand was associated with small, but statistically significant improvements in several self-reported mental disorder symptoms (i.e., symptoms of stress, anxiety, depression, hazardous alcohol use; mental health knowledge, and stigma regarding the danger and unpredictability of people with mental illness) at post-training. Some of these effects were sustained at a 3-month follow-up assessment (i.e., improvements in symptoms of stress, and mental health knowledge). Prior evaluations of BOS followed participants for longer than 3 months, but the small sample sizes and high attrition rates precluded assessments of longer term effects (Ioachim et al., 2024; Stelnicki, Jamshidi, Fletcher et al., 2021). The effects were sustained at follow-up, which is encouraging, considering participants had no additional material or BOS skills training in the interim. Future evaluations of BOS should assess for effects over longer time periods.

There were also small, but statistically significant, improvements in hazardous cannabis use, mental health knowledge, and knowledge of availability of mental health resources when comparing pre-training responses to responses at the 3-month follow-up. The small evidenced improvements in outcome measures following participation in BOS On-Demand training remain consistent with the current study expectations based on other reported mental health training programs for PSP and general populations (Bahji et al., 2022). The small effect sizes observed are likely associated with high individual variability within the outcome measures (see ICC values in Table 3). Prior studies evaluating BOS Intensive and BOS Classroom training modalities also evidenced small to moderate effect sizes, which they attributed to a combination of high individual variability in the measures and small effect sizes precluding the exploration of more nuanced interactions (Ioachim et al., 2024; Stelnicki, Jamshidi, Fletcher et al., 2021).

The current results are consistent with previous evaluations of the BOS program when delivered through BOS Classroom (Stelnicki, Jamshidi, Fletcher et al., 2021) and Intensive modalities (Ioachim et al., 2024), which also evidenced small, but statistically significant improvements in anxiety and mental health stigma. Replication of these findings is encouraging considering the lower cost and ease of distributing mental health training asynchronously and online through BOS On-Demand, rather than interactively through BOS Intensive or BOS Classroom modalities (Wayfound, 2024). Online accessible programs may have been particularly beneficial during the COVID-19 pandemic, given the associated restrictions which substantially impacted frontline PSP and HCP (who reported increased distress, moral injury, burnout, substance use, mental health disorder symptoms, and attrition at work) (Bouza et al., 2023; Patel et al., 2023; Smith-MacDonald et al., 2021; Statistics Canada, 2021; Xue et al., 2022).

Overall, the BOS On-Demand program was well-received by participants, with more participants rating the training as "extremely important" at post-training (25.8 %; n = 164) than at pre-training, and most participants (83.1 %; n = 103) identifying the training as either "very" or "extremely important" at a 3-month follow-up assessment. A statistically significantly higher proportion of participants also reported the use of journaling and breathing exercises at the 3-month follow-up compared to post-training, which may indicate that BOS On Demand was successful at encouraging continued practical skill use. The proportion of participants who reported using a skill was calculated based on the total number of participants who provided data for that timepoint. The MLM analyses and additional post hoc tests indicated there effects were statistically significant even when accounting for the considerable attrition from T1 to T3 data collections.

There was an overall decrease in PTSD symptoms, but the changes over time were not statistically significant, which is consistent with some previous research on BOS Intensive and Classroom training (Ioachim et al., 2024; Stelnicki, Jamshidi, Fletcher et al., 2021). There is also research evidencing a small (ES = 0.11), but statistically significant decrease in PTSD symptoms over time associated with the BOS Intensive program (Stelnicki, Jamshidi, Fletcher et al., 2021). The discrepancy may be attributed to differences in sample sizes or differences in delivery modalities as the statistically significant decrease in PTSD symptoms was observed in a sample of BOS Intensive participants who received the same learning content available in the BOS On-Demand program with additional group-processing opportunities within a clinician-facilitated group of peers (Stelnicki, Jamshidi, Fletcher et al., 2021). More research is needed to assess the relative impact of such modality differences.

Table 5
Two-level MLM results for overall scale totals in the BOS On-Demand modality.

	Fixed Effects			Random Effects		ICC
	Average baseline level γ00 (SE), [95 %CI], *p*	Average change (pre-training vs. post-training) estimate (SE), [95 %CI], Cohen's *d*, *p*	Average change (pre-training vs. 3-month follow-up) estimate (SE), [95 %CI], Cohen's *d*, *p*	Between person variance in Baseline level time τ00 estimate (SE), [95 %CI], p	Within individual variance σ^2 estimate (SE), [95 % CI], p	
DASS21-Stress	14.18 (0.39) [13.42, 14.95], *p*<.001	−1.44 (0.36) [−2.15, −0.73], *d* = −0.15, *p*<.001	−1.85 (0.64) [−3.12, −0.58], *d* = −0.19, *p*=.004	59.28 (5.64) [49.19, 71.44], *p*<.001	33.22 (3.91) [26.38, 41.83], *p*<.001	0.63
PHQ4	3.39 (0.12) [3.15, 3.63], *p*<.001	−0.32 (0.10) [−0.52, −0.12], *d* = −0.10, *p*=.002	−0.29 (0.20) [−0.68, 0.11], *d* = −0.10, *p*=.148	5.52 (1.05) [3.81, 8.01], *p*<.001	3.79 (0.96) [2.31, 6.24], *p*<.001	0.70
PHQ4 Anxiety	1.89 (0.07) [1.75, 2.02], *p*<.001	−0.17 (0.06) [−0.29, −0.05], *d* = −0.10, *p*=.005	−0.12 (0.12) [−0.35, 0.11], *d* = −0.07, *p*=.318	1.71 (0.24) [1.30, 2.25], *p*<.001	1.17 (0.20) [0.84, 1.65], *p*<.001	0.65
PHQ4 Depression	1.50 (0.07) [1.37, 1.63], *p*<.001	−0.15 (0.06) [−0.26, −0.04], *d* = −0.09, *p*=.010	−0.16 (0.11) [−0.38, 0.06], *d* = −0.10, *p*=.146	1.53 (0.31) [1.03, 2.26], *p*<.001	1.20 (0.28) [0.76, 1.91], *p*<.001	0.68
PCL5-SF4	4.16 (0.15) [3.87, 4.45], *p*<.001	0.07 (0.14) [−0.22, 0.35], *d* = 0.02, *p*=.617	−0.19 (0.26) [−0.70, 0.33], *d* = −0.05, *p*=.465	7.67 (0.89) [6.11, 9.63], *p*<.001	5.61 (0.70) [4.39, 7.17], *p*<.001	0.58
AUDIT-C	3.47 (0.09) [3.28, 3.65], *p*<.001	−0.13 (0.05) [−0.22, −0.04], *d* = −0.06, *p*=.009	−0.16 (0.10) [−0.35, 0.03], *d* = −0.07, *p*=.110	4.21 (0.30) [3.66, 4.84], *p*<.001	0.58 (0.12) [0.39, 0.85], *p*<.001	0.90
CUDIT	6.26 (0.43) [5.41, 7.11], *p*<.001	0.09 (0.28) [−0.45, 0.64], *d* = 0.02, *p*=.748	−1.28 (0.49) [−2.29, −0.28], *d* = −0.22, *p*=.011	28.53 (3.50) [22.44, 36.27], *p*<.001	3.90 (1.18) [2.16, 7.05], *p*<.001	0.87
BRS	3.49 (0.03) [3.43, 3.56], *p*<.001	0.01 (0.03) [−0.05, 0.06], *d* = 0.01, *p*=.739	0.06 (0.05) [−0.04, 0.15], *d* = 0.07, *p*=.231	0.46 (0.05) [0.37, 0.57], *p*<.001	0.20 (0.04) [0.14, 0.29], *p*<.001	0.75
SPS10	33.44 (0.23) [32.99, 33.90], *p*<.001	−0.35 (0.20) [−0.73, 0.04], *d* = −0.06, *p*=.081	0.57 (0.32) [−0.05, 1.19], *d* = 0.10, *p*=.075	24.77 (1.72) [21.61, 28.39], *p*<.001	7.75 (0.70) [6.49, 9.24], *p*<.001	0.71
SCMHA	22.54 (0.34) [21.86, 23.21], *p*<.001	0.15 (0.31) [−0.45, 0.75], *d* = 0.02, *p*=.629	−1.01 (0.50) [−2.00, −0.01], *d* = −0.12, *p*=.044	50.83 (3.94) [43.67, 59.16], *p*<.001	18.47 (1.98) [14.97, 22.78], *p*<.001	0.69
MAKS	23.96 (0.11) [23.75, 24.18], *p*<.001	0.35 (0.12) [0.12, 0.58], *d* = 0.13, *p*=.004	0.91 (0.20) [0.53, 1.30], *d* = 0.34, *p*<.001	3.92 (0.39) [3.22, 4.76], *p*<.001	3.08 (0.28) [2.57, 3.69], *p*<.001	0.49
MHSUQ	23.85 (0.20) [23.45, 24.25], *p*<.001	0.30 (0.20) [−0.09, 0.69], *d* = 0.06, *p*=.134	0.05 (0.39) [−0.72, 0.81], *d* = 0.01, *p*=.898	8.28 (3.57) [3.56, 19.27], *p*=.021	16.77 (3.55) [11.07, 25.41], *p*<.001	0.57
OMSWA	15.26 (0.21) [14.85, 15.67], *p*<.001	−0.23 (0.17) [−0.57, 0.11], *d* = −0.04, *p*=.177	−0.20 (0.32) [−0.84, 0.44], *d* = −0.04, *p*=.532	18.10 (1.77) [14.94, 21.93], *p*<.001	8.46 (1.26) [6.32, 11.33], *p*<.001	0.71
OMSWA - Avoidance	7.45 (0.12) [7.22, 7.67], *p*<.001	−0.01 (0.10) [−0.20, 0.20], *d* = −0.01, *p*=.920	−0.09 (0.18) [−0.43, 0.26], *d* = −0.03, *p*=.617	5.78 (0.46) [4.95, 6.75], *p*<.001	2.34 (0.25) [1.90, 2.88], *p*<.001	0.69
OMSWA - Danger	7.85 (0.12) [7.62, 8.08], *p*<.001	−0.27 (0.11) [−0.48, −0.06], *d* = −0.09, *p*=.014	−0.18 (0.21) [−0.59, 0.23], *d* = −0.06, *p*=.392	4.41 (0.83) [3.04, 6.38], *p*<.001	4.12 (0.76) [2.86, 5.92], *p*<.001	0.64

Note: SE, Standard error; ICC, intraclass correlation; DASS-21-Stress, Depression, Anxiety, and Stress Scale- Stress Subscale; PHQ4, Patient Health Questionnaire (total score and anxiety and depression subscales); PCL5-SF4, Posttraumatic Stress Disorder Checklist for DSM-5 Short Form; AUDIT-C, Alcohol Use Disorders Identification Test; CUDIT, Cannabis Use Disorders Identification Test; BRS, Brief Resilience Scale; SPS-10, Social Provisions Scale; SCMHA; Self-Care and Mental Health Access Scale; MAKS, Mental Health Knowledge Schedule; MHSUQ; Mental Health Services Use Questionnaire, OMSWA, Opening Minds Survey for Workplace Attitudes (total score and subscale for attitudes predicting avoidance and beliefs about danger and unpredictability).

The current data provided no evidence of a statistically significant improvement in self-reported resilience, which is consistent with previous BOS research (Stelnicki, Jamshidi, Fletcher et al., 2021). The BRS is a commonly used tool designed to evaluate an individual's self-assessed ability to recover or "bounce back" from stressful events, presumably informed by a lifetime of experiences. The current participant scores are already fairly high, which is reasonable given the participants' career choices, and may be producing a ceiling effect. Alternatively, the study window may have been too short or the training too focused on mental health to produce substantial changes as measured by the BRS. In any case, additional research is needed to better understand the absence of expected changes.

There may also be challenges associated with matching program foci to measured outcomes. For example, the current BOS results evidenced reductions in mental health stigma at post-training associated with an smaller effect size ($d = 0.09$) than for stigma reductions reported with previous BOS evaluations (e.g., $d = 0.18$; (Stelnicki, Jamshidi, Fletcher et al., 2021), and smaller than results from research on other in-person mental health training focused on increasing communication and reducing stigma (e.g., Road to Mental Readiness, $d = 0.26$; (Boehme et al., 2019; Szeto et al., 2019). Differences in the magnitude of effect sizes for stigma reduction between the current study and other evaluations may stem from program focus; specifically, other programs may focus more exclusively reducing stigma than BOS.

4.1. Strengths and limitations

The current study evidenced several encouraging improvements in

mental health symptom measures among PSP and HCP participating in BOS On-Demand training, but remains subject to several limitations which must be taken into consideration for future research. Firstly, the current study was associated with a government initiative primarily focused on training delivery which precluded the use of control groups or wait lists, resulting in a convenience sample of participants. More focused studies to directly compare participants engaged in mental health training with a waitlist control are needed to provide nuance to some of the observed effects. The time limitations dictated by the government funding also impacted participant attrition from T1 to T3, because many participants joined the initiative towards the end of the funding period or participated during high seasonal demands for their sector.

Secondly, due to concerns regarding time constraints experienced by PSP and HCP, outcome measures were limited to reduce the commitment required for research participation. Thirdly, the current study employed a sample consisting of several distinct PSP and HCP sectors, which limited the ability to assess whether observed changes in outcome measures were sector specific.

4.2. Future directions

Future research should obtain larger sample sizes from each sector to assess for differences between sectors. Future research should also extend data collection periods to allow sectors with high seasonal demands more time to participate. Larger and more complete samples would facilitate more nuanced analyses of potential interactions of factors (e.g., program effectiveness relative to the type of mental health injury symptoms participants experienced; associations with prior training). The current study followed up with participants only once at 3-months post-training. Future studies should use longer follow-up times to assess how long observed changes are sustained over time, with or without training refreshers. BOS On-Demand appeared to be comparably effective relative to other BOS modalities, but individual preferences for different training types may interact with effect sizes. Dedicated qualitative assessments of participant experiences in the BOS program may provide more complete perspectives on the program.

5. Conclusion

The current study builds upon earlier research assessing the impact of the BOS training program on PSP mental health by evaluating a new self-paced modality in the form of BOS On-Demand. BOS On-Demand was associated with encouraging improvements in several self-reported mental disorder symptom measures. As a virtual course, BOS On-Demand may be more easily accessible and cost-effective to distribute to larger populations. Despite the inherent differences in delivery methods, current results indicate that the impact of BOS On-Demand remains largely consistent with the original BOS Intensive modality. As PSP face numerous challenges accessing mental health training, offering various training delivery styles to suit individual needs is a valuable endeavour. When aiming for optimal mental health and well-being improvements among PSP, it remains crucial to consider both the empirical outcomes across different modalities and the subjective preferences of the participants.

CRediT authorship contribution statement

Gabriela Ioachim: Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Data curation. **Nicole Bolt:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation. **Kathy Bélanger:** Writing – review & editing, Investigation, Formal analysis. **Andrii Shulhin:** Writing – review & editing, Writing – original draft, Investigation. **Jilani Dabhoya:** Writing – review & editing, Writing – original draft, Investigation. **Juliana M.B. Khoury:** Writing – review & editing, Investigation. **Taylor A. Teckchandani:** Writing – review & editing, Methodology, Investigation, Formal analysis, Data curation. **Robyn E. Shields:** Writing – review & editing, Investigation. **Kirby Maguire:** Writing – review & editing, Investigation, Conceptualization. **R. Nicholas Carleton:** Writing – review & editing, Supervision, Investigation, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Nicholas R. Carleton reports financial support was provided by Public Health Agency of Canada. Nicholas R. Carleton reports a relationship with Wayfound Mental Health Group Inc that includes: non-financial support. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. Wayfound Mental Health Group Inc. delivered the Before Operational Stress training and provided administrative and logistical support for the personnel receiving the training. The company was not involved with the design, delivery, evaluation, or interpretation of the associated research study. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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