



# Internet-delivered cognitive behavioural therapy for symptoms of PTSD among public safety personnel: Initial outcomes of an open cohort preference trial of transdiagnostic and disorder-specific therapy

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## ABSTRACT

Public safety personnel (PSP) face high rates of mental health problems and many barriers to care. Initial outcomes of transdiagnostic internet-delivered cognitive behavioural therapy (ICBT) tailored for PSP are promising, but prior research has not evaluated outcomes of PTSD-specific ICBT among PSP or PSP's preferences for transdiagnostic or PTSD-specific ICBT. The current paper presents the initial outcomes ( $N = 150$ ) of a mixed-methods observational study designed to (a) investigate preferences for transdiagnostic or PTSD-specific ICBT among PSP with elevated symptoms of PTSD and/or a primary concern with PTSD symptoms and (b) explore potential differences in client engagement, satisfaction, and symptom changes between the two forms of ICBT. PSP completed questionnaires before and after their preferred ICBT program. Mixed-methods analyses included generalized estimating equations, descriptive statistics, and inductive conventional qualitative content analysis. More clients ( $n = 85$ ; 57 %) selected transdiagnostic ICBT than PTSD-specific ICBT ( $n = 65$ ; 43 %), but the difference in the number of clients who selected each course was not statistically significant. Clients in both ICBT programs reported similar and favorable treatment satisfaction (e.g., 98 % would recommend the course to a friend), treatment engagement (i.e., 69 % accessed at least four of the five lessons), and pre-post improvement in symptoms (e.g., Hedges'  $g = 0.81$  for reduction in PTSD symptom). Transdiagnostic ICBT resulted in greater reductions in symptoms of panic disorder than PTSD-specific ICBT. Qualitative analyses showed similarities across the ICBT programs in client feedback. The current study provides further evidence supporting the use and outcomes of ICBT for PSP in both transdiagnostic and disorder-specific formats. Implications for the literatures on PSP mental health and ICBT, as well as practical recommendations, are discussed.

## 1. Introduction

The phrase “public safety personnel” (PSP) refers to border services officers, correctional workers, career and volunteer firefighters, Indigenous emergency managers, operational intelligence personnel, paramedics, police, public safety communications officials, search and rescue personnel, and others (Canadian Institute for Public Safety Research and Treatment, 2019). PSP roles differ across sectors, but most

PSP experience a wide range of potentially psychologically traumatic events at work (e.g., attending to acts of violence or serious traffic accidents). A dose-response relationship has been observed between exposure to such events and symptoms of several emotional disorders, including posttraumatic stress disorder (PTSD), mood disorders, and anxiety disorders (Carleton et al., 2019). In a survey of 5813 PSP across Canada, 23.2 % were found to screen positive for current PTSD (Carleton et al., 2018), which is far higher than the past-month prevalence rate of

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2.4 % in the Canadian general population (Van Ameringen et al., 2008). The same study evidenced that 44.5 % of PSP screened positive for at least one mental disorder, including 26.4 % who screened positive for major depressive disorder, and 18.6 % who screened positive for generalized anxiety disorder (Carleton et al., 2018). PSP also experience unique logistical and attitudinal barriers to accessing mental health services (e.g., workplace stigma, inflexible work hours, limited employee work benefits; McCall et al., 2020a) in addition to barriers commonly faced by the general population (e.g., desire to self-manage mental health concerns, inconvenience, financial barriers, the unavailability of treatment, transportation barriers for those living in remote or rural areas; Andrade et al., 2014).

Internet-delivered cognitive behavioural therapy (ICBT) may help PSP overcome barriers to accessing mental healthcare because its online mode of delivery makes it convenient, private, and accessible at any time and location (McCall et al., 2020a; McCall et al., 2020b; Richards et al., 2018). Improving access to ICBT should be prioritized given the evidence of its effectiveness; for example, a meta-analysis of ICBT including 166 individual studies showed that therapist-guided ICBT is comparably effective to face-to-face therapy, producing “moderate to large effects reported for panic disorder, social anxiety disorder, generalized anxiety disorder, posttraumatic stress disorder, and major depression” (Andersson et al., 2019). Another meta-analysis synthesized research directly comparing ICBT with face-to-face psychotherapy, finding very similar outcomes across the two treatment modalities (Hedman-Lagerlöf et al., 2023). Meta-analyses focusing on ICBT for PTSD symptoms have shown similar results (Lewis et al., 2019; Sijbrandij et al., 2016). PSP appear to be interested in accessing ICBT; for example, Canadian PSP have ranked ICBT as their second most preferred treatment out of 13 treatment options, second only to face-to-face therapy with a psychologist (McCall et al., 2020b).

A clinical research unit called PSPNET was funded by the Government of Canada to offer ICBT to Canadian PSP in an effort to mitigate barriers PSP face in accessing evidence-based mental health care (Public Safety Canada, 2019). Given the high comorbidity of mental health challenges among PSP, PSPNET began offering the *PSP Wellbeing Course*, a transdiagnostic ICBT program targeting symptoms of depression, anxiety, and PTSD that was tailored specifically for Canadian PSP. An evaluation of the initial outcomes of the *PSP Wellbeing Course* showed a high rate of course completion, good treatment satisfaction, and large effect sizes for changes in symptoms of major depressive disorder and generalized anxiety disorder (Hadjistavropoulos et al., 2021a). However, the *PSP Wellbeing Course* evidenced only a moderate effect size for reducing PTSD symptoms (Hadjistavropoulos et al., 2021a), raising questions around whether PSP might demonstrate a greater preference for, or better outcomes from, a PTSD-specific ICBT program. The PSPNET team worked to address these questions by tailoring a PTSD-specific ICBT program called the *PSP PTSD Course*. The current study compared the new PTSD-specific course with the *PSP Wellbeing Course*.

To our knowledge, there have been no prior preference trials comparing transdiagnostic and PTSD-specific ICBT. A recent randomized controlled trial found that trauma-focused ICBT outperformed non-trauma-focused ICBT for treating PTSD, but the non-trauma-focused ICBT program in this study had been adapted to treat PTSD specifically and could likely be considered PTSD-specific rather than transdiagnostic (Ehlers et al., 2023). Several randomized trials have evidenced no differences in outcomes between transdiagnostic and disorder-specific ICBT for treating symptoms of major depressive disorder (Titov et al., 2015), generalized anxiety disorder (Berger et al., 2014; Dear et al., 2015), social anxiety disorder (Berger et al., 2014; Dear et al., 2016), panic disorder (Fogliati et al., 2016), and panic disorder with or without agoraphobia (Berger et al., 2014). Another randomized trial showed that disorder-specific ICBT was more effective for treating symptoms of major depressive disorder among participants with more severe pre-treatment symptoms (Johansson et al., 2012). However, a meta-analysis of these six randomized trials showed that

transdiagnostic ICBT was equally effective to disorder-specific ICBT for treating anxiety and more effective than disorder-specific ICBT for treating depression and improving clients' quality of life (Păsărelu et al., 2017). This finding was echoed by a naturalistic, non-randomized study wherein clinicians chose whether to prescribe transdiagnostic or disorder-specific ICBT for symptoms of depression and anxiety, which found small effects favoring transdiagnostic over disorder-specific ICBT (Newby et al., 2017).

Adopting a single, transdiagnostic therapy approach to treat multiple emotional concerns has certain advantages, including increased efficiency of clinician training, simplification of dissemination efforts, and improved ability to help clients who present with comorbid emotional problems (Barlow, 2014; Titov et al., 2012), which are extremely common, particularly among PSP (Carleton et al., 2018). However, patient treatment preferences can also impact enrollment, attrition, adherence, satisfaction, and outcomes, and should be considered when selecting between transdiagnostic and disorder-specific treatment approaches (American Psychological Association, 2006; Delevry and Le, 2019; Preference Collaborative Review Group, 2008).

The current study presents the initial results of an open preference trial exploring PSP's preferences for the transdiagnostic *PSP Wellbeing Course* and the disorder-specific *PSP PTSD Course*, as well as any differences between the courses with respect to treatment outcomes. Specifically, we aimed to investigate possible differences in (a) PSP's preferences for each course; (b) their level of engagement and satisfaction with each course; and (c) outcomes at eight weeks post-enrollment for each course.

## 2. Methods

### 2.1. Study design

The current study used an open cohort preference trial design. Prospective clients were offered a choice of enrolling in the *PSP Wellbeing Course* or the *PSP PTSD Course*. We prepared this article in accordance with the principles set forth in the STROBE statement (Strengthening the Reporting of Observational Studies in Epidemiology; von Elm et al., 2007). The current study was registered on [Clinicaltrials.gov](https://clinicaltrials.gov) (NCT04335487)<sup>1</sup> and approved by the University of Regina's research ethics board (File 2019-157). The present article presents outcomes among the first 150 clients included in this study. At the time this article was published, recruitment for this study was ongoing to increase the sample size and address additional research questions not addressed in the present article (e.g., outcomes at 26 and 52 weeks post-enrollment; predictors of treatment outcomes, secondary outcomes). We omitted these outcomes in the present article due to limited availability of data and/or for the sake of brevity, but we plan to publish all available outcomes once data collection for this study is complete.

<sup>1</sup> We have made several changes to our methods since releasing our original trial protocol: (a) expanding access to this study to PSP residing in the Canadian provinces of Saskatchewan, Quebec, Nova Scotia, New Brunswick, Prince Edward Island, and Ontario due to interest from these provinces; (b) replacing the Sheehan Disability Scale with the Work and Social Adjustment Scale because we were unable to obtain permission to use the former; (c) removing a clinical interview from our planned outcome measures (Section H of the Mini International Neuropsychiatric Interview) due to lack of resources; (d) removing two questionnaires assessing exposure to potentially psychologically traumatic events (the Life Events Checklist for DSM-5 and a bespoke questionnaire inquiring about the worst event ever experienced) to reduce the burden of questionnaires on clients; and (e) limiting our administration of outcome measures between 9 and 16 weeks post-enrollment to clients who are still engaged in treatment at those timepoints (i.e., rather than to all clients at those timepoints) to reduce the burden of questionnaires on clients.

## 2.2. Setting

Since July 2020, PSPNET has offered the *PSP Wellbeing Course* and the *PSP PTSD Course* to PSP who speak English and reside in the Canadian province of Saskatchewan. Clients from several other Canadian provinces were included in the study when registered therapists and funding were available.

## 2.3. Eligibility screening and intervention preference

Prospective PSPNET clients completed a two-stage screening process to enroll in one of PSPNET's ICBT courses. First, prospective clients completed an online battery of questionnaires assessing demographic, clinical, and other characteristics (described in detail below). Second, they underwent a screening interview by phone with a PSPNET clinician. In order to be eligible to enroll in a PSPNET course, a prospective client was required to (a) be at least 18 years old; (b) be a current or former PSP; (c) have regular access to a computer with internet connection; (d) provide an emergency medical contact; and (e) reside in a province in which PSPNET offers services. Prospective clients were excluded and referred to more suitable services if they (a) presented with elevated risk of suicide or reported a past-year suicide attempt or suicide-related hospitalization; (b) reported a primary presenting problem related to psychosis, mania, or substance use; (c) reported that they were currently receiving another psychological treatment (excluding medication) more than twice per month; or (e) reported concerns about ICBT and requested a referral to other services in their community.

Prospective PSPNET clients who reported clinically significant symptoms of PTSD, defined as a score of 33 or greater on the Post-traumatic Stress Disorder Checklist for DSM-5 (PCL-5; [Bovin et al., 2016](#); [Wortmann et al., 2016](#)), were offered the choice of the *PSP Wellbeing Course* or the *PSP PTSD Course* and included in the present study. In addition, some prospective clients with PCL-5 scores of <33 were offered the choice of both courses if PTSD symptoms were their primary reported concern. During the telephone screen, PSPNET clinicians explained the similarities and differences between the courses and helped prospective clients choose a course that best fit their goals for treatment. Prospective PSPNET clients who were not assigned to the current preference trial were assisted by PSPNET clinicians in finding a suitable care pathway (e.g., the *PSP Wellbeing Course*, referral to another treatment).

## 2.4. Interventions

The *PSP Wellbeing Course* and the *PSP PTSD Course* were both based on the *Wellbeing Course* and the *PTSD Course*, initially developed by the eCentreClinic Clinic at Macquarie University, Australia, for use in the general public. The *Wellbeing Course* has been extensively researched and found effective in Australia and the Canadian Province of Saskatchewan ([Dear et al., 2015, 2016](#); [Fogliati et al., 2016](#); [Hadjistavropoulos et al., 2021b](#); [Titov et al., 2015](#)). The *PTSD Course* has been shown to be effective in at least two studies in Australia ([Spence et al., 2011, 2014](#)). Both courses are also used at the Australian MindSpot Clinic, which is funded by the Australian Government to deliver digital mental health services across Australia ([Titov et al., 2020](#)).

Tailoring digital mental health interventions for specific user groups has been recommended as a means of improving engagement and outcomes (e.g., [Fleming et al., 2016](#); [Ludden et al., 2015](#)). PSPNET conducted two studies to explore the specific needs and treatment preferences of PSP ([McCall et al., 2020a](#); [McCall et al., 2020b](#)). The results were then used to tailor the *PSP Wellbeing Course* and the *PSP PTSD Course*.

The two courses were similar in many respects. Both included five lessons, which presented treatment content via text, diagrams, and case vignettes in a slideshow format over eight weeks with optional therapist

guidance by phone or encrypted email up to twice per week for up to 16 weeks, based on client preference. Therapists held graduate degrees in psychology or social work. Therapists also checked in with clients based on clients' self-reporting on a weekly set of questionnaires assessing symptoms and engagement with the course. This questionnaire included open- and closed-ended questions intended to spark reflection regarding clients' experiences in the program, including the skills clients focused on, how much effort they put into the course, whether any difficulties arose, and the degree to which clients found the course difficult, understandable, and helpful. Both courses also included weekly homework assignments, downloadable resources, and additional illustrative case vignettes tailored to reflect the experiences of Canadian PSP. In both courses, the lessons included content related to psychoeducation and an introduction to the cognitive behavioural model (Lesson 1); monitoring and challenging maladaptive thoughts (Lesson 2 in the *PSP Wellbeing Course*; Lesson 3 in the *PSP PTSD Course*), managing physical symptoms (Lesson 3 in the *PSP Wellbeing Course*; Lesson 2 in the *PSP PTSD Course*); graded exposure (Lesson 4); and relapse prevention (Lesson 5). Both courses also included additional resources with information on managing problems that are not addressed in the main lessons (e.g., anger, grief, sleep problems, pain). The primary difference between the two courses was that the vignettes, examples, and case stories in the *PSP PTSD Course* described the use of CBT skills to manage posttraumatic stress, whereas the vignettes, examples, and case stories in the *PSP Wellbeing Course* described the use of CBT skills to manage a wide variety of emotional concerns, including problems related to depression, low mood, generalized anxiety, social anxiety, health anxiety, panic, PTSD, and obsessive-compulsive disorder.

## 2.5. Measures

Clients were administered several measures at pre-treatment and eight weeks post-enrollment: the Posttraumatic Stress Disorder Checklist for the DSM-5 (PCL-5; [Blevins et al., 2015](#); Cronbach's  $\alpha = 0.95$ ), Generalized Anxiety Disorder-7 (GAD-7; [Spitzer et al., 2006](#); Cronbach's  $\alpha = 0.89$ ), Patient Health Questionnaire-9 (PHQ-9; [Kroenke et al., 2001](#); Cronbach's  $\alpha = 0.87$ ), Panic Disorder Severity Scale Self-Report (PDSS-SR; [Shear et al., 2001](#); Cronbach's  $\alpha = 0.90$ ), a combined measure consisting of the six-item versions of the Social Phobia Scale and Social Interaction Anxiety Scale (SPS-6/SIAS-6; [Peters et al., 2012](#); Cronbach's  $\alpha = 0.92$ ), and the Dimensions of Anger Reactions Scale (DAR-5; [Hawthorne et al., 2006](#); Cronbach's  $\alpha = 0.86$ ). A bespoke Treatment Satisfaction Questionnaire was also administered at eight weeks post-enrollment. The decision to measure symptoms at eight weeks post-enrollment—even though the courses were available with therapist support for up to 16 weeks—was based on our experience that most clients complete most of the course by eight weeks. Several additional measures not germane to the purposes of the current study were also administered.<sup>2</sup>

## 2.6. Data and analyses

### 2.6.1. Quantitative data and analyses

Statistical analysis was conducted in SPSS version 28. Descriptive statistics were computed for *PSP Wellbeing Course* clients, *PSP PTSD Course* clients, and the overall sample, and chi-square analyses and *t*-tests were conducted to determine whether there were any statistically

<sup>2</sup> Additional measures included the following: the abbreviated PTSD Checklist – Civilian Version (abbreviated PCL-C); the Insomnia Severity Index (ISI); select items from the SLEEP-50 Questionnaire; the Alcohol Use Disorders Identification Test (AUDIT); the Drug Use Disorders Identification Test (DUDIT); the Brief Resiliency Scale (BRS); a Canadian-adapted version of the Treatment Inventory of Costs in Patients with Psychiatric Disorders (TiC-P); and the Working Alliance Inventory - Short Revised (WAI-SR).

significant differences between the two courses with respect to client characteristics. Chi-square analyses were also conducted to assess for differences between the two courses with respect to the number of clients who enrolled in each, completion rates of questionnaires at eight weeks post-enrollment, and completion of the courses themselves, which was defined as accessing at least the first four of the five lessons. A one-way ANOVA was conducted to assess for differences in treatment satisfaction scores.

To analyze symptom change, we followed intention-to-treat

principles and used multiple imputation to generate replacement values for missing data. Consistent with previous research, a modified intention-to-treat approach was employed, where only clients starting the intervention were included in the analysis (e.g., [Hadjistavropoulos et al., 2021a](#)). Also consistent with recommendations and previous research ([Karin et al., 2018](#)), imputation accounted for clients' baseline symptoms severity, the treatment provided, and lesson adherence. We analyzed data using generalized estimating equation (GEE) models. We employed a gamma distribution with a log link function and an

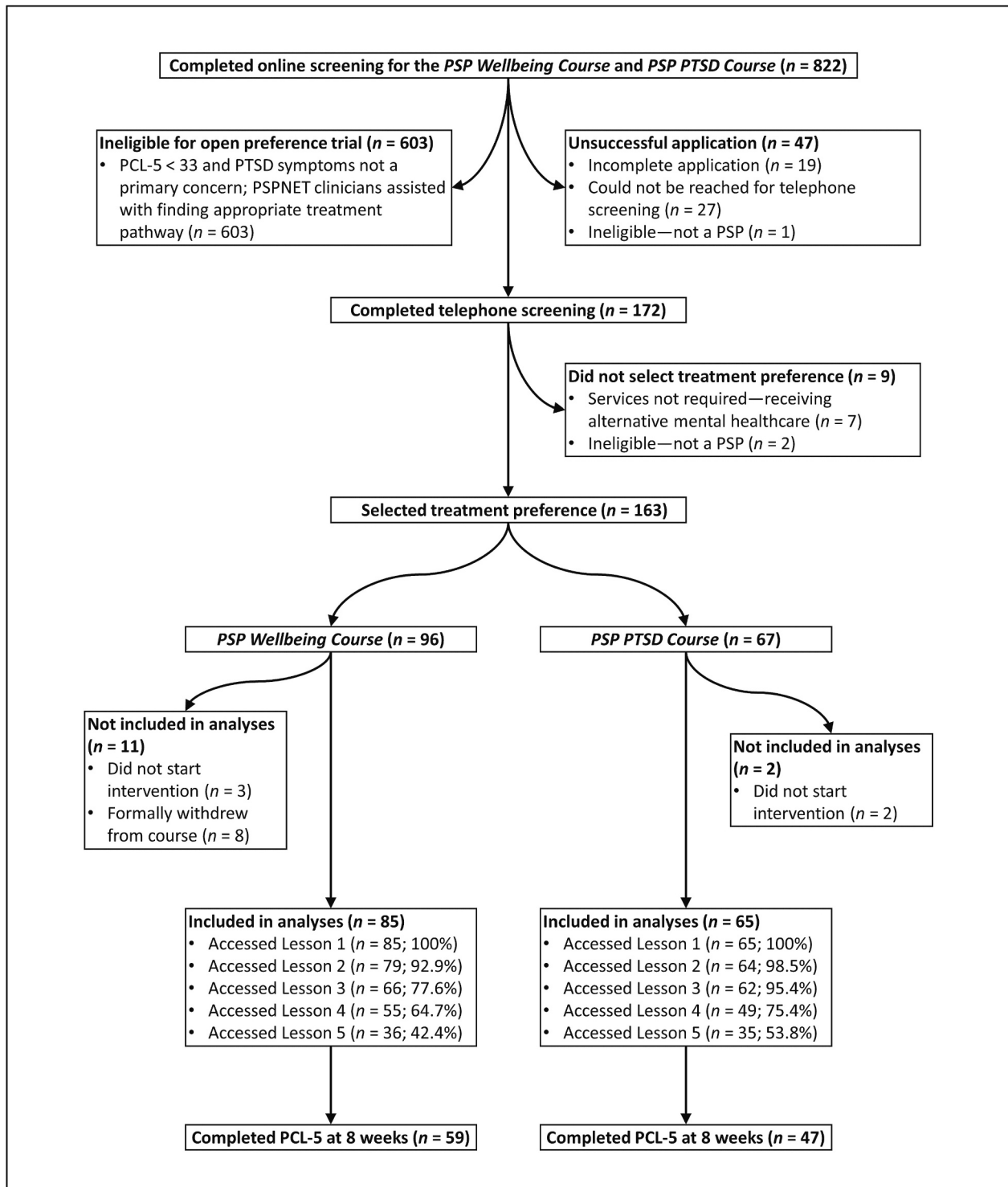


Fig. 1. Flowchart displaying client enrollment, program usage, and questionnaire completion.

unstructured working correlation matrix to account for skewness and different rates of change between time points, respectively. GEE model analysis was conducted for each outcome variable, and we used pairwise comparisons to identify changes between specific time points and between groups.

Using multiply imputed data, we also examined the proportion of clients experiencing clinically significant improvement or deterioration of symptoms on our three primary measures. Consistent with prior research, clinically significant improvement was defined as a decrease of 6 points on the PHQ-9 (National Collaborating Centre for Mental Health, 2019), 5 points on the GAD-7 (Titov et al., 2017, 2020), and 10 points on the PCL-5 (Byllesby et al., 2019). Clinically significant deterioration was defined as an increase in score of the same magnitude for each measure.

2.6.2. Qualitative data and analyses

Qualitative data was collected for a subsample of clients that included the first 28 clients who enrolled in each course and completed the TSQ. This subsample provided an adequate sample size to explore differences in responses between the two courses (Boddy, 2016). Specifically, open-ended responses from the Treatment Satisfaction Questionnaire were analyzed to assess clients' perceptions of helpful aspects of the course and areas for improvement.

All qualitative data was de-identified and imported into NVIVO 20. An inductive conventional qualitative content analysis was conducted to analyze the data (Hsieh and Shannon, 2005). Author J.D.B. initially coded data into categories by meaning units. Coding of data was then checked and refined through discussions with author C.A.L. Response frequencies are reported to emphasize overall trends; however, due to the open-ended nature of the questionnaires, the percentages of clients who endorsed each category only capture those who spontaneously made comments reflecting each category and may underestimate the proportion of clients who would endorse each category (Maxwell, 2010). In cases wherein data was reflective of more than one category, the data were coded into all applicable categories.

3. Results

3.1. Sample characteristics

A total of 163 clients were given the choice of enrolling in either the PSP Wellbeing Course or the PSP PTSD Course, and 150 of these clients started one of the two courses and were eligible to be included in the analyses described below. The flow of clients from eligibility screening to post-treatment questionnaires is displayed in Fig. 1. More clients selected the PSP Wellbeing Course (n = 85, 57 %) compared to the PSP PTSD Course (n = 65, 43 %), but the difference was not statistically significant,  $X^2(1) = 2.67, p = .102$ . Demographic characteristics were calculated for each course and for the total sample (Table 1). There were no statistically significant demographic differences between clients in each course, all  $ps > .05$ . On average, clients scored above clinical cut-off scores on several of the six symptom measures (i.e., PHQ-9, GAD-7, PCL-5, DAR-5, PDSS-SR, SIAS-6/SPS-6) in both the PSP Wellbeing Course (M = 4.48, SD = 1.38) and the PSP PTSD Course (M = 4.00, SD = 1.86). Most clients in the PSP Wellbeing Course (n = 59, 69.4 %) and the PSP PTSD Course (n = 47, 72.3 %) completed questionnaires at eight weeks post-enrollment.

3.2. Quantitative comparison of the PSP Wellbeing Course and PSP PTSD Course

With respect to program engagement, across the two courses, most clients (69.3 %) accessed at least four lessons. There was not a statistically significant difference in course completion rates between the courses, which was defined as completion of at least the first four lessons,  $X^2(1, 150) = 1.98, p = .16$ . There were also no statistically significant differences between courses with respect to completion of

Table 1 Sample demographic characteristics.

	Total (n = 150)	PSP PTSD Course (n = 65)	PSP Wellbeing Course (n = 85)
Gender, n (%)			
Women	78 (52.0)	34 (52.3)	44 (51.8)
Men	71 (47.3)	32 (47.7)	40 (47.1)
Non-binary	1 (0.7)	0	1 (1.2)
Province, n (%)			
Alberta	1 (0.7)	0 (0)	1 (1.2)
New Brunswick	18 (12.0)	11 (16.7)	7 (8.2)
Nova Scotia	12 (8.0)	3 (4.6)	9 (10.6)
Ontario	2 (1.3)	1 (1.5)	1 (1.2)
Prince Edward Island	7 (4.7)	2 (3.1)	5 (5.9)
Quebec	8 (5.3)	5 (7.7)	3 (3.5)
Saskatchewan	102 (68.0)	43 (66.2)	59 (69.4)
PSP sector, n (%)			
Police	44 (29.3)	21 (32.3)	23 (27.1)
Fire	23 (15.3)	11 (16.9)	12 (14.1)
Corrections	31 (20.7)	13 (20.0)	18 (21.2)
Communications (e.g., 911 dispatch)	12 (8.0)	6 (9.2)	6 (7.1)
Paramedics/related emergency service	27 (18.0)	8 (12.3)	19 (22.4)
Border services	5 (3.3)	3 (4.6)	2 (2.4)
Other	8 (4.7)	3 (4.5)	5 (5.9)
Ethnicity, n (%)			
White	127 (84.7)	51 (78.5)	76 (89.4)
Indigenous (i.e., First Nations, Inuit, Metis)	16 (10.7)	10 (15.4)	6 (7.1)
Ethnic minority (e.g., Middle Eastern; Black; Asian; Latin American)	4 (2.8)	1 (1.5)	3 (3.6)
Prefer not to answer	3 (2.0)	3 (4.5)	0
Age, n (%)			
20–29	29 (19.5)	9 (13.8)	20 (23.8)
30–39	36 (24.2)	15 (23.1)	21 (25.0)
40–49	56 (37.6)	24 (36.9)	32 (38.1)
50+	28 (18.8)	17 (26.2)	11 (13.1)
Age, M (SD)	40.8 (10.5)	42.6 (10.5)	39.3 (10.2)

questionnaires at eight weeks post-enrollment,  $X^2(2, 150) = 1.78, p = .41$ .

Results of the GEE analyses showed large effect sizes for reductions in symptoms on the PHQ-9, GAD-7, and PCL-5, a moderate effect size for reductions in symptoms on the DAR-5, and a small effect size for reductions in symptoms on the SIAS-6/SPS-6. Reductions in symptoms on the PDSS-SR were moderate for clients of the PSP Wellbeing Course and small for clients of the PSP PTSD Course. Across both courses, percentage changes in symptoms ranged from 20.3 % (SIAS-6/SPS-6) to 38.8 % (PHQ-9). Mean scores on symptom measures for each group and time, as well as effect sizes and percentage changes in symptoms, are detailed in Table 2 below.

An effect of time was observed for all symptom measures (i.e., the PHQ-9, GAD-7, PCL-5, DAR-5, PDSS-SR, and SIAS-6/SPS-6), such that symptom severity declined over time across both courses. Pairwise comparisons showed that clients of the PSP Wellbeing Course experienced a statistically significant reduction in symptoms between pre-treatment and post-treatment on the PHQ-9, GAD-7, PCL-5, DAR-5, and PDSS-SR, all  $ps < .001$  and a marginally significant reduction in symptoms on the

**Table 2**  
Means, standard errors, percentage change and effect sizes.

	n	Means (SE)		% change [95 % CI] Post	Hedge's g effect size [95 % CI]		
		Pre	Post		Pre (between)	Pre → post (within)	Post (between)
PHQ-9							
PSP Wellbeing Course	85	16.1 (0.55)	9.4 (0.96)	41.4 [28.1, 54.7]	0.34 [0.02, 0.67]	0.93 [0.62, 1.25]	0.04 [-0.29, 0.36]
PSP PTSD Course	65	14.2 (0.77)	9.1 (1.00)	43.4 [30.3, 56.6]	...	0.71 [0.35, 1.06]	...
Overall	150	15.1 (0.49)	9.2 (0.76)	38.8 [27.5, 50.1]	...	0.75 [0.52, 0.99]	...
GAD-7							
PSP Wellbeing Course	85	14.5 (0.43)	8.6 (0.70)	40.4 [30.3, 50.6]	0.31 [-0.02, 0.63]	1.11 [0.79, 1.43]	-0.08 [-0.4, 0.25]
PSP PTSD Course	65	13.1 (0.66)	9.1 (0.83)	37.3 [25.4, 49.3]	...	0.66 [0.31, 1.02]	...
Overall	150	13.8 (0.41)	8.8 (0.59)	35.7 [26.6, 44.9]	...	0.80 [0.57, 1.04]	...
PCL-5							
PSP Wellbeing Course	85	47.4 (1.03)	30.2 (2.02)	36.1 [27.5, 44.7]	-0.02 [-0.34, 0.31]	1.16 [0.84, 1.49]	-0.16 [-0.49, 0.16]
PSP PTSD Course	65	47.6 (1.71)	33.6 (2.89)	29.0 [16.3, 41.6]	...	0.73 [0.38, 1.09]	...
Overall	150	47.5 (1.00)	31.9 (1.99)	32.8 [23.8, 41.7]	...	0.81 [0.57, 1.04]	...
DAR-5							
PSP Wellbeing Course	85	13.0 (0.46)	10.0 (0.59)	37.6 [22.4, 52.8]	0.00 [-0.32, 0.32]	0.62 [0.31, 0.92]	-0.08 [-0.41, 0.24]
PSP PTSD Course	65	13.0 (0.57)	10.5 (0.83)	30.7 [8.4, 52.9]	...	0.44 [0.09, 0.79]	...
Overall	150	13.0 (0.37)	10.3 (0.49)	34.4 [21.7, 47.1]	...	0.51 [0.28, 0.74]	...
PDSS-SR							
PSP Wellbeing Course	85	9.2 (0.54)	6.0 (0.59)	34.9 [21.4, 48.4]	0.11 [-0.21, 0.43]	0.52 [0.22, 0.83]	-0.30 [-0.63, 0.02]
PSP PTSD Course	65	8.6 (0.78)	8.0 (0.72)	12.8 [-2.5, 28.3]	...	0.10 [-0.24, 0.44]	...
Overall	150	8.9 (0.48)	6.9 (0.49)	22.0 [10.8, 33.2]	...	0.34 [0.11, 0.57]	...
SIAS-6/SPS-6							
PSP Wellbeing Course	85	15.3 (1.09)	12.7 (1.43)	16.8 [-2.8, 36.5]	0.02 [-0.3, 0.34]	0.22 [-0.08, 0.52]	0.10 [-0.22, 0.42]
PSP PTSD Course	65	15.1 (1.38)	11.5 (1.36)	24.4 [6.4, 42.5]	...	0.33 [-0.02, 0.67]	...
Overall	150	15.2 (0.88)	12.1 (1.04)	20.3 [5.8, 34.7]	...	0.26 [0.04, 0.49]	...

SIAS-6/SPS-6,  $p = .05$ . Further pairwise comparisons showed that clients of the *PSP PTSD Course* experienced a statistically significant reduction in symptoms between pre-treatment and post-treatment on the PHQ-9, GAD-7, PCL-5, DAR-5, and SIAS-6/SPS-6, all  $p$ 's  $< .004$  and no significant reduction in symptoms on the PDSS-SR,  $p = .34$ .

Pairwise comparisons showed that clients who selected the *PSP Wellbeing Course* had higher pre-treatment scores on the PHQ-9 than those who enrolled in the *PSP PTSD Course*,  $p = .048$ . Pre-treatment scores did not differ on any other measures. The GEE models revealed a group by time interaction for scores on the PDSS-SR, such that clients in the *PSP Wellbeing Course* experienced a greater reduction in panic symptoms than those in the *PSP PTSD Course*,  $\chi^2 = 14.3$ ,  $p = .001$ . Post-treatment scores on the PDSS-SR were shown to be higher for clients in the *PSP PTSD Course* than those in the *PSP Wellbeing Course*,  $p = .02$ . The results of the GEEs showed no other group by time interactions and no main effects of group. Pairwise comparisons showed no other differences in post-treatment symptoms. Additional details pertaining to the results of the GEE analyses are shown in [Table 3](#). The percentage of clients showing clinically significant improvement or deterioration in scores on the PHQ-9, GAD-7, and PCL-5 are shown in [Table 4](#).

Almost all clients who completed the treatment satisfaction questionnaire ( $n = 100$ ; 98.0 %) reported that they would recommend the

course to a friend. Most clients ( $n = 81$ , 78.4 %) reported that participating in the course increased or greatly increased their confidence in their ability to manage their symptoms, and most ( $n = 80$ , 79.4 %) reported being satisfied or very satisfied with the course. A one-way ANOVA was conducted to assess for differences in treatment satisfaction between courses, showing no statistically significant differences in whether clients would recommend the course to a friend,  $F(1, 100) = 0.01$ ,  $p = .91$ , how the course impacted their confidence in their ability to manage their symptoms,  $F(1, 100) = 0.01$ ,  $p = .93$ , or the degree to which they reported being satisfied with the course overall  $F(1, 100) = 0.09$ ,  $p = .76$ .

### 3.3. Results of qualitative analyses

Clients identified aspects of the courses as helpful more frequently than they identified areas for improvement (see [Tables 5 and 6](#)). Overall, clients in both courses provided similar feedback. With respect to aspects of the course deemed helpful, therapist support was cited by a greater proportion of clients in the *PSP PTSD Course* (17.86 %) than in the *PSP Wellbeing Course* (7.14 %). Finding the entire course helpful was also cited by a greater proportion of clients in the *PSP PTSD Course* (10.71 %) than in the *PSP Wellbeing Course* (0 %). On the other hand, the

**Table 3**  
Statistical effects and comparisons.

	GEE effects			p values from pairwise comparisons			
	Time	Group	Time × group	Pre (between)	PSP Wellbeing Course pre → post	PSP PTSD Course pre → post	Post (between)
PHQ-9	$\chi^2 = 108.3$ , $p < .001$	$\chi^2 = 1.7$ , $p = .299$	$\chi^2 = 1.5$ , $p = .406$	.048	<.001	<.001	.591
GAD-7	$\chi^2 = 85.6$ , $p < .001$	$\chi^2 = 0.4$ , $p = .579$	$\chi^2 = 2.9$ , $p = .166$	.076	<.001	<.001	.568
PCL-5	$\chi^2 = 97.3$ , $p < .001$	$\chi^2 = 1.0$ , $p = .324$	$\chi^2 = 1.6$ , $p = .234$	.736	<.001	<.001	.243
DAR-5	$\chi^2 = 63.4$ , $p < .001$	$\chi^2 = 0.5$ , $p = .525$	$\chi^2 = 1.6$ , $p = .311$	.771	<.001	<.001	.355
PDSS-SR	$\chi^2 = 27.5$ , $p < .001$	$\chi^2 = 1.3$ , $p = .271$	$\chi^2 = 14.3$ , $p = .001$	.513	<.001	.338	.018
SIAS-6/SPS-6	$\chi^2 = 20.4$ , $p < .001$	$\chi^2 = 0.3$ , $p = .637$	$\chi^2 = 1.1$ , $p = .432$	.912	.050	.004	.481

**Table 4**  
Percentage of clients experiencing clinically significant changes in symptoms.

	Total (n = 150)	PSP PTSD Course (n = 65)	PSP Wellbeing Course (n = 85)
<b>PHQ-9</b>			
Clinically significant improvement, %	50.5	45.2	54.6
No clinically significant change, %	46.5	51.4	42.8
Clinically significant deterioration, %	2.9	3.4	2.6
<b>GAD-7</b>			
Clinically significant improvement, %	51.7	40.3	60.5
No clinically significant change, %	42.5	54.8	33.2
Clinically significant deterioration, %	5.7	4.9	6.4
<b>PCL-5</b>			
Clinically significant improvement, %	63.2	57.5	67.5
No clinically significant change, %	29.7	34.5	26.1
Clinically significant deterioration, %	7.1	8.0	6.4

**Table 5**  
Reported helpful aspects of the ICBT courses.

Helpful aspects of course	Total (n = 56)	PSP PTSD Course (n = 28)	PSP Wellbeing Course (n = 28)
Do-it-yourself (DIY) guides	17 (30.36 %)	9 (32.14 %)	8 (28.57 %)
Additional resources	14 (25.00 %)	6 (21.43 %)	8 (28.57 %)
Stories	14 (25.00 %)	5 (17.86 %)	9 (32.14 %)
Psychoeducation information	12 (21.43 %)	6 (21.43 %)	6 (21.43 %)
Convenience or flexibility	11 (19.64 %)	6 (21.43 %)	5 (17.86 %)
Therapist contact or check-ins	7 (12.50 %)	5 (17.86 %)	2 (7.14 %)
Structure or layout of course	5 (8.93 %)	1 (3.57 %)	4 (14.29 %)
Entire course	3 (5.36 %)	3 (10.71 %)	0

**Table 6**  
Reported areas for improvement in the ICBT courses.

Aspects to improve	Total (n = 56)	PSP PTSD Course (n = 28)	PSP Wellbeing Course (n = 28)
Nothing	17 (30.36 %)	9 (32.14 %)	8 (28.57 %)
Changes to course content	6 (10.71 %)	2 (7.14 %)	4 (14.29 %)
Need for more face-to-face contact or referrals to other services	5 (8.93 %)	0	5 (17.86 %)
Stories	5 (8.93 %)	2 (7.14 %)	3 (10.71 %)
Survey issues (e.g., timing, redundancy, question choices)	5 (8.93 %)	3 (10.71 %)	2 (7.14 %)
Increase time to complete course	4 (7.14 %)	2 (7.14 %)	2 (7.14 %)
Other (e.g., include printed worksheets, create an app)	4 (7.14 %)	3 (10.71 %)	1 (3.57 %)
Technical issues	5 (8.93 %)	3 (10.71 %)	2 (7.14 %)
Add audio or video	3 (5.36 %)	0	3 (10.71 %)

stories were cited as helpful by a greater proportion of clients in the *PSP Wellbeing Course* (32.14 %) than in the *PSP PTSD Course* (17.86 %). Likewise, a greater proportion of clients in the *PSP Wellbeing Course* (14.29 %) than in the *PSP PTSD Course* (3.57 %) described the structure or layout of the course as helpful. With respect to recommended areas of improvement, a desire for face-to-face contact with therapists was cited by 17.86 % of clients in the *PSP Wellbeing Course* but was not mentioned by any clients in the *PSP PTSD Course*. Additional audio or video content was recommended by 10.71 % of clients in the *PSP Wellbeing Course* but was not mentioned by any clients in the *PSP PTSD Course*.

#### 4. Discussion

##### 4.1. Summary of the nature and purpose of this study

PSP frequently experience potentially psychologically traumatic events through their work, which places them at greater risk of developing various mental health problems, including PTSD, anxiety, and depression (Carleton et al., 2018, 2019). PSP also face unique barriers to care (e.g., McCall et al., 2020a). ICBT is an effective treatment that can overcome many treatment barriers (Andersson et al., 2019). Transdiagnostic and disorder-specific ICBT have demonstrated similar outcomes (Păsărelu et al., 2017), but transdiagnostic approaches to treatment have certain advantages (Barlow, 2014; Titov et al., 2012). Preliminary results suggest that PSP have favorable attitudes toward tailored ICBT (McCall et al., 2020a; McCall et al., 2020b) and benefit from it (Hadjistavropoulos et al., 2021a). The present study was an open preference trial designed to explore PSP's preferences for transdiagnostic and PTSD-specific ICBT and the relative outcomes of these two treatment approaches.

##### 4.2. Key findings, implications, and future directions for transdiagnostic and disorder-specific ICBT

Despite the very high rate of comorbid mental health problems in addition to PTSD symptoms in this sample, the number of clients who selected the *PSP Wellbeing Course* was only slightly greater than the number who selected the *PSP PTSD Course*, and this difference was not statistically significant. Clients who selected the *PSP Wellbeing Course* were differentiated from those who selected the *PSP PTSD Course* by greater symptoms of depression, indicating that therapists and clients were successful in collaboratively deciding that transdiagnostic ICBT is a better fit for clients with more severe comorbid mental health challenges. There were no other statistically significant differences with respect to the demographic or clinical characteristics of PSP who selected each course.

Perhaps the most important finding of the initial outcomes of this study is that the *PSP Wellbeing Course* and the *PSP PTSD Course* generally demonstrated similar outcomes. Clients in both courses reported large reductions in symptoms of depression, generalized anxiety, and PTSD, moderate reductions in anger, small reductions in social anxiety, high rates of treatment satisfaction, and a relatively high rate of course completion. There was only one statistically significant difference in treatment outcomes between the two courses: namely, the *PSP Wellbeing Course* was found to be considerably more effective for treating symptoms of panic disorder than the *PSP PTSD Course*.

The finding of favorable treatment outcomes for therapist-guided ICBT replicates many previous studies in the ICBT literature, including studies of the original, non-tailored versions of the ICBT programs used in the current study (e.g., Hadjistavropoulos et al., 2021b; Titov et al., 2017) and the results of meta-analyses of ICBT more generally (Andersson et al., 2019; Lewis et al., 2019; Sijbrandij et al., 2016). This is unsurprising, given that the content and format of most ICBT interventions is relatively similar and has changed little over time. For example, one of the earliest ICBT programs for PTSD, like the *PSP PTSD Course*, was also eight weeks in duration, also included weekly homework assignments,

and also included elements of psychoeducation, cognitive restructuring, exposure, breathing retraining, and relapse prevention (Ivarsson et al., 2014). The finding of relatively lower effectiveness for the treatment of social anxiety is consistent with a previous study of the *PSP Wellbeing Course*, which showed that the course was more effective for treating all other types of symptoms measured (Hadjistavropoulos et al., 2021a).

The finding of generally equivalent outcomes across the two courses echoes other findings in the literature comparing transdiagnostic and disorder-specific ICBT (Berger et al., 2014; Dear et al., 2015, 2016; Fogliati, 2016; Johansson et al., 2012; Newby et al., 2017; Păsărelu et al., 2017; Titov et al., 2015). To our knowledge, the present study is the first documented open preference trial in which clients were given the choice of enrolling in a transdiagnostic or disorder-specific ICBT program. To our knowledge, it is also the first to compare transdiagnostic and disorder-specific ICBT tailored specifically for a unique population. The current study's design as an open preference trial sets it apart from previous studies comparing transdiagnostic and disorder-specific ICBT, but it lends support to the past finding that disorder-specific ICBT does not outperform transdiagnostic ICBT. If anything, the current study suggests that transdiagnostic ICBT was more effective for our sample, as indicated by a statistically significantly greater effect for treating symptoms of panic disorder and larger effect sizes for symptom change on measures of most types of symptoms, including PTSD symptoms.

The present study builds on growing evidence that transdiagnostic ICBT is at least as effective as disorder-specific ICBT for treating symptoms of various emotional disorders. As described above, transdiagnostic approaches have several advantages, including simplifying the training of clinicians, simplifying the dissemination of treatments, and helping therapists deal effectively with comorbid emotional disorders among clients (Barlow, 2014; Titov et al., 2012), which are extremely common. Additionally, transdiagnostic ICBT interventions can be offered with optional, modular, disorder-specific elements focusing on issues that some clients may wish to address; this has been described as “individually tailored” ICBT, and the choice of treatment content in this approach can be made by clients themselves (e.g., Andersson et al., 2011) and/or clinicians (e.g., Nordgren et al., 2014). The *PSP Wellbeing Course* adopted the former approach via its additional resources, allowing clients to access optional modules to help them manage symptoms of PTSD (and both courses included optional modules for many other presenting concerns). Despite the benefits of transdiagnostic treatments, providing patients with choices about their treatment preferences is associated with improved treatment outcomes (Delevry and Le, 2019) and is consistent with recommendations from several groups (e.g., American Psychological Association, 2006; Ludden et al., 2015; Preference Collaborative Review Group, 2008), which may support offering both disorder-specific and transdiagnostic ICBT interventions even if the former are less efficient and no more effective than the latter. The ICBT literature would likely benefit from several additional studies (e.g., randomized trials, preference trials, a meta-analysis using individual participant data) comparing transdiagnostic and disorder-specific interventions for treating a range of mental health concerns to allow firmer conclusions to be drawn about the circumstances under which disorder-specific ICBT may be advantageous.

#### 4.3. Key findings, implications, and future directions for PSP mental health

The average client of the *PSP Wellbeing Course* scored above established clinical cut-offs on 4.48 of the six symptom measures we administered, while the average *PSP PTSD Course* client scored above clinical cut-offs on 4.00, highlighting that comorbidity is very common in this population. This result is consistent with the results of a large national survey, which found that only 15.1 % of Canadian PSP reported clinically-significant symptoms of one mental disorder, while 26.7 % reported significant symptoms of two or more mental disorders

(Carleton et al., 2018). The implication of these findings is that individuals and organizations involved in providing mental healthcare to Canadian PSP should be prepared to treat complex mental health concerns, including symptoms of several mental disorders. To this end, transdiagnostic treatment approaches may be particularly helpful.

The initial outcomes of the present study also add to the emerging literature on the use of ICBT tailored specifically for PSP. In particular, the current study is consistent with previous findings that tailored ICBT is acceptable to PSP (Beahm et al., 2021; McCall et al., 2020a; McCall et al., 2020b) and clinically effective among PSP for symptoms of various emotional disorders (Hadjistavropoulos et al., 2021a). The current results build on previous work by evidencing that both transdiagnostic and disorder-specific ICBT are acceptable and clinically effective. These results also help identify directions for future work that could more deeply explore the possible differences in user experience between clients of the two courses and areas for improvement. In brief, these results confirm that PSP find ICBT acceptable, that it is clinically effective, and that it should therefore be considered an effective treatment option for this population. More broadly, the current findings add to a growing literature on the use of internet interventions tailored specifically for occupation groups that face unique work-related stressors (e.g., medical professionals; Smoktunowicz et al., 2021).

#### 4.4. Limitations and strengths

The current study had several important limitations that can inform future research directions. First, the current study was an open preference trial without randomization to condition, which limits our ability to draw conclusions about the relative effectiveness of the *PSP Wellbeing Course* and the *PSP PTSD Course*. Second, we conducted several separate quantitative analyses without accounting for family-wise error, thereby increasing the likelihood of one or more false positives and/or false negatives. Finally, the current study was insufficiently powered to detect small differences between the *PSP Wellbeing Course* and the *PSP PTSD Course*, which is a particularly important limitation because previous research comparing transdiagnostic and disorder-specific ICBT has generally found small differences or no differences, as described above (e.g., Păsărelu et al., 2017).

The current study also had some important strengths. The work fills several gaps in the literature as the first study we are aware of to compare transdiagnostic and disorder-specific ICBT (a) for PTSD symptoms, (b) tailored for a unique population, and (c) within an open preference trial. Using a mixed-methods approach provided a more robust understanding of clients' experiences when taking the *PSP Wellbeing Course* and the *PSP PTSD Course*.

## 5. Conclusion

The results of this study build on prior evidence that ICBT is an effective, acceptable, and accessible treatment for PSP and should be considered a useful treatment option for this population. The results also support existing evidence that disorder-specific ICBT is not more effective than transdiagnostic ICBT. A single transdiagnostic ICBT program can be provided more efficiently than several disorder-specific ICBT programs, suggesting a need for further research to identify whether and when disorder-specific ICBT is preferable to transdiagnostic ICBT. Transdiagnostic ICBT—and other transdiagnostic mental healthcare services—may be particularly important for PSP, who often experience symptoms of several comorbid mental disorders.

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## Declaration of competing interest

The authors 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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