Psychological Medicine

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'Tell Your Story': a randomized controlled trial of an online intervention to reduce mental health stigma and increase help-seeking in refugee men with posttraumatic stress

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Original Article

Cite this article: Nickerson A, Byrow Y, Pajak R, McMahon T, Bryant RA, Christensen H, Liddell BJ (2020). 'Tell Your Story': a randomized controlled trial of an online intervention to reduce mental health stigma and increase help-seeking in refugee men with posttraumatic stress. *Psychological Medicine* **50**, 781–792. https://doi.org/10.1017/S0033291719000606

Received: 8 January 2019
Revised: 13 February 2019
Accepted: 4 March 2019
First published online: 11 April 2019

Key words:
refugees; posttraumatic stress disorder; stigma; trauma; help-seeking.

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Abstract

Background. Refugees report elevated rates of posttraumatic stress disorder (PTSD), but are relatively unlikely to seek help for their symptoms. Mental health stigma is a key barrier to help-seeking amongst refugees. We evaluated the efficacy of an online intervention in reducing self-stigma and increasing help-seeking in refugee men.

Methods. Participants were 103 refugee men with PTSD symptoms from Arabic, Farsi or Tamil-speaking backgrounds who were randomly assigned to either receive an 11-module online stigma reduction intervention specifically designed for refugees ('Tell Your Story', TYS) or to a wait-list control (WLC) group. Participants completed online assessments of self-stigma for PTSD and help-seeking, and help-seeking intentions and behaviors at baseline, post-intervention, and at a 1 month follow-up.

Results. Intent-to-treat analyses indicated that, compared to the WLC, TYS resulted in significantly smaller increases in self-stigma for seeking help from post-treatment to follow-up ($d = 0.42$, $p = 0.008$). Further, participants in the TYS conditions showed greater help-seeking behavior from new sources at follow-up ($B = 0.69$, 95% CI 0.19–1.18, $p = 0.007$) than those in the WLC. The WLC showed significantly greater increases in help-seeking intentions from post-intervention to follow-up ($d = 0.27$, $p = 0.027$), relative to the TYS group.

Conclusions. This is the first investigation of a mental health stigma reduction program specifically designed for refugees. Findings suggest that evidence-based stigma reduction strategies are beneficial in targeting self-stigma related to help-seeking and increasing help-seeking amongst refugees. These results indicate that online interventions focusing on social contact may be a promising avenue for removing barriers to accessing help for mental health symptoms in traumatized refugees.

There are currently over 68 million people forcibly displaced as a result of war and persecution worldwide (UNHCR, 2017). Rates of psychological disorders, such as posttraumatic stress disorder (PTSD), are elevated in displaced populations (Bogic *et al.* 2015). In recent decades, great strides have been made in the development of effective therapies for PTSD in refugees, with research pointing to the efficacy of trauma-focused approaches (Thompson *et al.* 2018). Despite this, mental health help-seeking is disproportionately low amongst refugees, with only a minority who are identified as having mental health problems accessing formal psychological assistance (Savin *et al.* 2005; Laban *et al.* 2007; de Anstiss *et al.* 2009; Barghadouch *et al.*, 2016). The mismatch between the mental health needs of refugees, and the low treatment uptake, is of critical importance as failure to access psychological treatment may confer heightened risk of ongoing distress and impairment.

Mental health stigma, particularly negative beliefs about one's own psychological symptoms ('self-stigma') and seeking mental health assistance (Corrigan *et al.* 2005; Wong *et al.*, 2006), represents a key barrier to help-seeking amongst refugees (Morris *et al.* 2009; Shannon *et al.* 2012). These beliefs may further compound due to the nature of refugee experiences. For example, reduced trust in authority figures following persecution-related trauma (Nickerson *et al.*, 2018), and limited knowledge regarding the mental health system in their host country (Wong *et al.*, 2006) may reinforce negative beliefs about help-seeking. Mental health stigma thus represents an important target to increase help-seeking and alleviate PTSD amongst refugee communities.

To our knowledge, there has been no intervention developed to specifically reduce mental health stigma in refugees. In the broader literature, interventions implementing psychoeducation, social contact and cognitive behavioral elements have demonstrated small-to-moderate effects in reducing mental health stigma in a variety of groups, including individuals with

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depression and schizophrenia, as well as professionals working with individuals with mental illness (Mittal *et al.* 2012; Clement *et al.*, 2015; Thornicroft *et al.*, 2016). Social contact with others with mental illness seems to be a particularly effective strategy for reducing mental health stigma (Dickstein *et al.* 2010; Corrigan, 2011). Social contact refers to situations where individuals who have experienced mental illness share their personal experiences with others (Clement *et al.*, 2012). There are challenges, however, in implementing this strategy due to the tendency of populations with high levels of mental health stigma to avoid seeking out opportunities to talk about their symptoms. There is growing evidence, however, that social contact delivered via electronic media (i.e. viewing videos of individuals speaking about their psychological symptoms) is equally effective in reducing mental health stigma as live contact (Corrigan *et al.* 2007; Clement *et al.*, 2012). Social contact thus represents a highly promising strategy for refugee groups as it opens the possibility of online stigma reduction interventions. This may be particularly well-suited to the refugee context, for three key reasons: first, individuals are often displaced from important sources of support to whom they may have previously turned to discuss mental health difficulties (reducing the likelihood of live social contact) (UK and Oxfam, 2018), second, online interventions are highly scalable which allows them to be broadly disseminated within displaced populations where it may otherwise be difficult to identify and follow-up individuals who are reluctant to seek mental health assistance, and third, refugees report high levels of internet use to keep in touch with family and friends who remain in the country of origin or who are displaced across the globe (Leung, 2010; 2011; Dekker *et al.* 2016; Dekker *et al.* 2018), which is also reflected in settlement services frequently adopting online modalities to communicate with their clients. To date, however, there has been no evaluation of whether online strategies including social contact are effective in reducing mental health stigma in refugee groups.

In the current study, we developed the first mental health stigma intervention specifically for refugees. This online program ['Tell Your Story' (TYS)] implemented evidence-based strategies including social contact, psychoeducation, and cognitive reappraisal to specifically target self-stigma related to PTSD and help-seeking amongst refugee men. We focused on refugee men as they are less likely to access psychological treatment than women (Gilgen *et al.*, 2005; Marshall *et al.*, 2006), and to facilitate the tailoring of social contact in our intervention to ensure gender-appropriateness. We hypothesized that, relative to the wait-list control (WLC) group, participants in the TYS condition would show (1) reduced self-stigma related to PTSD symptoms, (2) reduced self-stigma related to help-seeking, (3) increased help-seeking intentions, and (4) increased help-seeking behaviors.

Method

Participants

Participants were 103 male refugees from Arabic, Farsi or Tamil-speaking backgrounds (TYS: $n = 54$; WLC, $n = 49$). Inclusion criteria were refugee or asylum-seeking background, ability to read in one of the study languages, between 18 and 65 years of age, internet access, male gender, and at least one clinically significant symptom of PTSD (i.e. causing distress to the participant, and occurring in the last month). We included individuals with at least one PTSD symptom to encompass individuals with trauma-related distress, rather than just those will a full diagnosis of PTSD. Exclusion criteria were currently seeing a mental health professional, and being actively suicidal. See Table 1 for participant characteristics. See Figure 1 for participant flow through the study.

Measures

All measures were translated and back-translated into Arabic, Farsi or Tamil following gold-standard procedures (World Health Organization, n.d.). Minor discrepancies were rectified by the research team and translators with experience in working with mental health material.

PTSD symptom screen

Potential participants were screened for PTSD symptoms using the Primary Care PTSD Screen for DSM-5 (Prins *et al.*, 2016). This 5-item measure indexes the presence of key PTSD symptoms. Participants were asked (via telephone) whether they experience PTSD symptoms, including nightmares/intrusive thoughts, avoidance of trauma reminders, hypervigilance/startle, feeling numb/detached, feeling guilty/self-blame (yes/no responses). Participants screened into the study if they endorsed at least one of these items.

PTE exposure

The 16-item Harvard Trauma Questionnaire (HTQ; Mollica *et al.*, 1992) was used to index potentially traumatic events commonly experienced by refugees in this study. Participants indicated whether they had experienced or witnessed 16 types of traumatic events to which refugees are commonly exposed (e.g. lack of food or water, murder of family or friends, torture). The HTQ yields a count of types of traumatic events to which the individual has been exposed, ranging from 0 to 16.

Symptoms of PTSD

The 16-item Posttraumatic Diagnostic Scale (Foa, 1996) was used in this study to index symptoms of PTSD. As the DSM-5 version of the PDS was not available at the start of the study, four additional items were included to measure DSM-5 symptoms of PTSD. These items included negative expectations about oneself or the world, distorted self- or other-blame, pervasive negative emotional states and reckless or self-destructive behavior. Participants were asked to indicate on a 4-point scale (0 = *not at all or only once*, 3 = *5 or more times a week/ almost always*) how often each symptom bothered them in the past month. Responses were summed to provide a total PTSD symptom severity score. Internal consistency in this study was $\alpha = 0.95$. A DSM-5 derived algorithm was used to determine probable PTSD caseness (i.e., one intrusive, one avoidance, two negative alterations in cognition and mood, and one arousal symptom), and for sub-syndromal PTSD (meeting criteria for intrusive symptoms as well as one other PTSD symptom cluster) was also implemented. For this, scores of 2 (2–4 times per week/half the time) or 3 (5 or more times per week/ almost always) were considered to represent the presence of a symptom.

Depression and anxiety symptoms

The 25-item Hopkins Symptom Checklist (Mollica *et al.* 1987) was implemented in this study to investigate baseline symptoms of depression and anxiety. This scale yields two subscales, a 15-item subscale measuring depression symptoms, and a ten-item subscale measuring anxiety symptoms. Participants were asked to indicate on a four-point scale how bothered they were by each symptom in the past week (1 = *not at all,* 4 = *extremely*).

https://doi.org/10.1017/S0033291719000606 Published online by Cambridge University Press

Table 1. Participant characteristics and baseline group differences

	Overall sample $n = 103$	TYS group $n = 54$	WLC group $n = 49$	Statistic
Age (M/S.D.)	39.37 (9.88)	38.30 (9.27)	41.13 (10.39)	$t_{(93)} = 1.40$, $p = 0.17$
Language group (*N*/%)				
Arabic	79 (76.7%)	41 (75.9%)	38 (77.6%)	
Farsi	18 (17.5%)	9 (16.7%)	9 (18.4%)	
Tamil	6 (5.8%)	4 (7.4%)	2 (4.1%)	$\chi^2(2) = 0.54$, $p = 0.76$
Visa status				
Insecure visa status	27 (26.2%)	15 (27.8%)	12 (24.5%)	
Secure visa status	76 (73.8%)	39 (72.2%)	37 (75.5%)	$\chi^2(1) = 0.14$, $p = 0.70$
Exposure to potentially traumatic events (PTEs) (M/S.D.)	7.47 (4.17)	7.29 (3.75)	7.67 (4.61)	$t_{(91)} = 0.43$, $p = 0.67$
Self-stigma relating to PTSD	36.68 (9.01)	35.32 (8.48)	37.90 (9.62)	$t_{(101)} = 1.45$, $p = 0.15$
Self-stigma for seeking help	25.70 (6.14)	25.37 (5.96)	26.06 (6.38)	$t_{(101)} = 0.57$, $p = 0.57$
Help-seeking intentions	45.82 (15.64)	46.31 (15.51)	45.27 (15.92)	$t_{(104)} = -0.16$, $p = 0.87$
Help-seeking behaviors (number of sources of support accessed in past 2 weeks)	0.96 (0.96)	0.91 (0.90)	1.02 (1.03)	Wald $\chi^2(1) = 0.34$, $p = 0.56$
PTSD symptoms	18.17 (14.27)	18.59 (15.56)	17.71 (12.84)	$t_{(100.13)} = -0.31$, $p = 0.75$

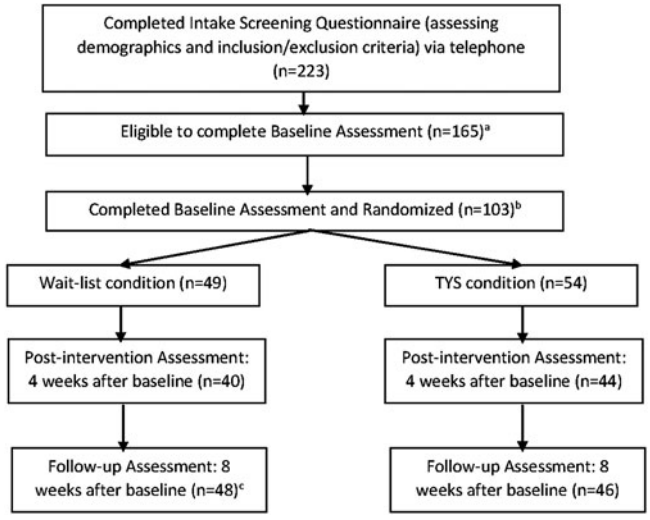

Fig. 1. Flow of participants through the study (Consolidated Standards of Reporting Trials; CONSORT). (a) Of the 58 ineligible individuals 49 did not meet inclusion criteria (under 18 years old, $n = 2$; currently seeing a psychologist/counsellor, $n = 8$; no PTSD symptoms endorsed, $n = 17$; actively suicidal, $n = 4$; Other reasons, $n = 18$) and 9 declined to participate. (b) Of the 62 individuals that did not complete baseline assessment, 12 declined participation (reasons included begin too busy, focused on resettlement e.g., establishing stable housing), 10 did not continue due to problems with technology, and 40 individuals were not contactable. (c) After completing this assessment, participants in the WLC could access the TYS intervention.

Responses were summed to provide a total depression symptom severity score ($\alpha = 0.95$), and a total anxiety symptom severity score ($\alpha = 0.93$).

Self-stigma for PTSD

The 16-item Self-Stigma for Depression scale (Barney *et al.* 2010) was adapted to measure self-stigma for PTSD in this study. Items were adapted to measure the extent to which an individual holds negative beliefs in relation to PTSD symptoms (e.g. *'If I experienced symptoms of posttraumatic stress, I would feel ashamed'*). Participants indicate how they would feel if they experienced symptoms of post-traumatic stress on a 5-point scale from *Strongly Disagree* (1) to *Strongly Agree* (5). Previous studies have both used these subscales separately and as a total score, with the subscales representing a higher-order factor relating to self-stigma (Barney *et al.*, 2010; Gaudiano and Miller, 2013; Howard *et al.* 2018). Investigation of these subscales indicated that, contrary to expectation, the self-blame subscale was not significantly correlated with the other subscales (contact first author for results of these analyses). Accordingly, this scale was omitted from calculations of the total score. Internal consistency in this study was $\alpha = 0.91$.

Self-stigma for help-seeking

The 10-item Self-Stigma of Seeking Help Scale (Vogel *et al.* 2006) was used to measure self-stigma related to seeking help from a professional in this study. Participants responded to items indexing beliefs about seeing therapist or other mental health professional. Five items measured negative beliefs about seeking help (e.g. *'I would feel inadequate if I went to a therapist for psychological help'*), and five measured neutral or positive beliefs about seeking help (e.g. *'I would feel okay about myself if I made the choice to seek professional help'*). Participants responded on a four-point scale ranging from *Strongly disagree* (1) to *Strongly agree* (4). The five neutral items were reverse-scored so, when summed, the scale reflected negative beliefs about seeking help. Internal consistency in this study was $\alpha = 0.82$.

Help-seeking intentions

Help-seeking intentions were measured using an 11-item adapted version of the General Help-Seeking Questionnaire (Deane *et al.* 2001). Participants responded to the query: *How likely is it that you would seek help from each of these people for a personal or emotional problem over the next four weeks.* Potential help-seeking sources were identified in conjunction with refugee settlement

https://doi.org/10.1017/S0033291719000606 Published online by Cambridge University Press

Table 2. Module content for the tell your story intervention

Module	Strategies	Content
1 Meeting X and Y	Social contact Psychoeducation	Detailed introductory videos of two refugee men (in each language group) who are followed throughout the program Education about common refugee experiences
2 Surviving Stress	Psychoeducation	Participants learn about how traumatic experiences and stress can impact day to day life. Overview of common psychological symptoms associated with PTSD.
3 How does stress affect me?	Social contact Psychoeducation	Participants learn about the symptoms experienced by refugee men via video case studies. Participants identify their own psychological symptoms related to posttraumatic stress.
4 Growing Stronger	Cognitive reappraisal	Participants identify and reappraise their own negative beliefs about psychological symptoms.
5 Keeping it all inside	Social contact Psychoeducation	Participants observe the men in the videos expressing their own concerns about seeking help. Participants identify their own help-seeking concerns.
6 I'd like to talk, but…	Cognitive reappraisal	Participants reappraise their own help-seeking concerns.
7 How can talking help	Psychoeducation	Participants learn about the benefits of sharing their experiences with someone they trust from refugee men in the videos. Participants identify the potential benefits of talking about their problems.
8 Who could I talk to	Psychoeducation Help-seeking planning	Participants identify suitable people to talk to and share concerns and experiences with (e.g. a trustworthy family member, friend, or a professional). Participants learn about different professional roles and how each professional may be able to help them.
9 Advice for X	Cognitive reappraisal	Participants work through a 'case example' of a refugee man with a similar background who is struggling with psychological problems. Participants complete an activity in which they help this man challenge his negative beliefs/stigma about mental health problems.
10 Planning Action	Cognitive reappraisal Help-seeking planning	Provides an overview of the user's own most salient stigma and help-seeking concerns (drawn from personal responses to previous activities). Participants complete an activity in which they identify the challenges and benefits to help-seeking. Participants develop a personalized plan of action for help-seeking.
11 Summary	Help-seeking planning Social contact	Participants review their plan of action. Participants watch a summary video of refugee men in the video case studies to increase motivation moving forward.

services in NSW, Australia, and comprised friend, spouse/partner, parent, son/daughter, other family member, caseworker, community leader, doctor/general practitioner, teacher, religious leader, mental health professional. Participants responded on a four-point scale ranging from *Very unlikely* (1) to *Extremely likely* (4). Internal consistency for this scale was $\alpha = 0.87$

Help-seeking behaviors

Help-seeking behaviors were measured using an 11-item adapted version of the Actual Help-Seeking Questionnaire (Rickwood *et al.* 2005). Participants responded to the query: *Below is a list of people who you might seek help or advice from if you were experiencing a personal or emotional problem. Select any of those who you have gone to for advice or help in the past 2 weeks for a personal or emotional problem.* The same 11 categories were implemented as in the help-seeking intentions measure. Dichotomous responses were summed to yield a count of different types of help-seeking sources accessed in the past 2 weeks, ranging from 0 to 11.

Program usability

A 14-item scale designed for the current study was implemented to index program usability. This scale measured the following domains: the modality by which participants accessed the intervention (computer/laptop, tablet, smartphone; one item), how easy participants found the program to use (1 = very difficult to 5 = very easy; one item), the extent to which the website was attractive, easy to understand, and provided useful information (1 = strongly disagree to 5 = strongly agree; three items), the extent to which the video stories were interesting (1 = strongly disagree to 5 = strongly agree; one item), the extent to which examples and information were relevant to the user (1 = strongly disagree to 5 = strongly agree; one item), the extent to which the program put the user in a positive or negative mood (1 = strongly disagree to 5 = strongly agree; two items), the extent to which the program took too long to do (1 = strongly agree to 5 = strongly disagree; one item), and how much the user enjoyed using the program overall, and found it interesting/engaging, relevant and useful (1 = not at all to 4 = extremely; four items)

Procedure

This study was conducted in compliance with the UNSW Human Research Ethics Committee (Approval number: HC15351). The trial was prospectively registered on the Australia and New Zealand Clinical Trial Registry (Trial ID ACTRN12616000815460), with primary outcomes prospectively defined as self-stigma related to PTSD, self-stigma related to help-seeking and help-seeking intentions. Help-seeking behaviors were defined as a secondary study outcome. Participants were recruited via advertisements at refugee casework services in Sydney, Australia who provided services to recently-arrived refugees and social media platforms. The

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Table 3. Means and standard deviations of study variables at each time-point

Outcome	Timepoint	TYS Mean (s.d.), *n*	WLC Mean (s.d.) *n*
Self-stigma for PTSD	Baseline	35.32 (8.48) *n* = 54	37.90 (9.62) *n* = 49
	Post-intervention	33.74 (9.60) *n* = 43	36.68 (9.01) *n* = 40
	Follow-up	31.29 (9.94) *n* = 45	35.83 (9.42) *n* = 47
Self-stigma for help-seeking	Baseline	25.37 (5.96) *n* = 54	26.06 (6.38) *n* = 49
	Post-intervention	26.02 (5.77) *n* = 43	25.75 (4.62) *n* = 40
	Follow-up	25.20 (5.40) *n* = 45	27.15 (6.31) *n* = 47
Help-seeking intentions	Baseline	46.31 (15.52) *n* = 45	45.27 (15.92) *n* = 49
	Post-intervention	47.12 (14.47) *n* = 42	43.95 (16.65) *n* = 40
	Follow-up	45.05 (15.88) *n* = 44	46.09 (15.42) *n* = 47
Number of sources of help accessed in past 2 weeks	Baseline	0.91 (0.90) *n* = 54	1.02 (1.03) *n* = 49
Number of new sources of help accessed in past 2 weeks	Post-intervention	0.68 (0.77) *n* = 41	0.63 (0.85) *n* = 40
Number of new sources of help accessed in past 2 weeks	Follow-up	0.69 (0.86) *n* = 44	0.47 (0.78) *n* = 47

intervention was described as being an online program designed to assist refugee men with managing stress. Participants were screened by telephone for study eligibility by a postdoctoral researcher (YB) with extensive experience in conducting clinical interviews with refugees. After determining that participants reported at least one of five key symptoms of PTSD using the PC-PTSD, the interviewer assessed whether the symptom/s were distressing to the participant, and had occurred in the past month. Participants with significant suicidal intent or a plan for suicide, were excluded from the study and referred to the appropriate clinical service. Those with suicidal ideation were not excluded from the study. Following determination of eligibility, participants were emailed a link to the participant information and consent statement, and, after signing this electronically, completed baseline measures online. Next, participants were randomized to a treatment condition using a computer-generated number sequence embedded in the website, and were automatically directed to a webpage that informed them of the results of the randomization. Participants in the TYS condition had immediate access to the intervention; those in the WLC were informed that they would have the opportunity to use the intervention after the follow-up assessment. The post-intervention and follow-up assessments were completed online at 4 and 8 weeks after baseline, respectively. Participants in both conditions received a postal reminder 7 days and an automated reminder email 3 days prior to the assessment due date. This was supplemented by telephone contact and SMS reminders relating to completing the assessments for both conditions. Reminders to complete modules were not provided to avoid attention effects. Accordingly, conditions did not differ in frequency of contact ($t_{(102)} = 0.15$, $p = 0.879$). Participants received $AUD20 for completing post-intervention and follow-up measures.

TYS intervention

The TYS intervention consisted of 11 short interactive web-based modules comprising information, short videos, and activities designed to reduce stigma and increase help-seeking (see Table 2 for a detailed description of the TYS intervention). Recognizing that informal sources represent important avenues for help-seeking, particularly amongst individuals from collectivist cultures (Drummond *et al.* 2011; Slewa-Younan *et al.*, 2014; Markova and Sandal, 2016; Yaser *et al.*, 2016), we focused on both formal (i.e. psychologist, GP, community leader) and informal (friend, family member) sources of help. Strategies implemented in this intervention included psychoeducation, social contact and cognitive reappraisal of negative beliefs about mental health and help-seeking. Modules were completed in a pre-determined order. Participants were permitted to complete up to three modules per week over a 4-week period. The focal point of the intervention was a series of videos featuring Arabic, Farsi and Tamil-speaking men sharing their personal experiences in overcoming stigma (to facilitate social contact). Other activities involved participants entering information onto the website (i.e. ranking potential help-seeking sources, identifying salient beliefs). This intervention did not involve any therapist assistance, however a computerized algorithm was used to feedback participants' responses to various activities, to assist them in generating a help-seeking plan, which was the final activity in the program. The TYS intervention was

https://doi.org/10.1017/S0033291719000606 Published online by Cambridge University Press

Table 4. Results of mixed-models analyses predicting self-stigma, help-seeking and social functioning in TYS group *v.* wait list control group

	Pre- to post-intervention					Post-intervention to follow-up				
	Est	S.E.	df	*t*	*p*	Est	S.E.	df	*t*	*p*
Self-stigma for PTSD										
Intercept	36.81	1.40	96.91	26.29	<0.001	36.76	1.52	104.04	24.23	<0.001
Time	−0.03	0.03	78.71	−0.94	0.349	−0.02	0.03	77.19	−0.51	0.614
Condition	−3.20	1.99	99.23	−1.60	0.112	−3.71	2.13	100.74	−1.75	0.084
Time × Condition	−0.01	0.04	79.47	−0.19	0.848	−0.03	0.04	77.29	−0.61	0.541
Effect size (d)	−0.03					−0.17				
Self-stigma for help-seeking										
Intercept	25.69	0.85	103.92	30.07	<0.001	25.56	0.87	112.73	29.25	<0.001
Time	0.01	0.02	78.96	0.06	0.956	0.05	0.02	78.12	2.33	0.022
Condition	0.41	1.22	106.95	0.34	0.738	0.53	1.22	108.51	0.44	0.664
Time × Condition	0.04	0.03	80.02	1.23	0.224	−0.08	0.03	78.27	−2.72	0.008
Effect size (d)	0.16					−0.42				
Help-seeking intentions										
Intercept	44.52	2.48	97.88	17.92	<0.001	43.22	2.54	96.60	17.05	<0.001
Time	−0.04	0.05	77.82	−0.87	0.387	0.09	0.05	75.12	1.73	0.088
Condition	1.64	3.55	101.04	−0.46	0.644	3.07	3.57	94.65	0.86	0.391
Time × Condition	0.04	0.07	78.78	0.52	0.606	−0.15	0.06	75.29	−2.26	0.027
Effect size (d)	0.14					−0.27				
PTSD symptoms										
Intercept	0.87	0.11	89.14	7.75	<0.001	0.86	0.12	86.11	7.24	<0.001
Time	0.01	0.01	77.66	0.43	0.67	−0.01	0.01	74.73	−0.58	0.57
Condition	0.09	0.16	90.59	0.56	0.58	0.08	0.17	85.19	0.51	0.61
Time × Condition	0.01	0.01	78.10	1.54	0.13	−0.01	0.01	74.76	−0.10	0.92
Effect size (d)	0.07					−0.11				

developed in collaboration with Arabic, Farsi and Tamil-speaking Community Advisory Boards (CABs) to ensure that the materials (while standardized across language groups) were optimally culturally relevant. This involved initial interviews with members of the CABs and other community members regarding the relevance and potential utility of strategies being considered for inclusion in the intervention, and to generate content for specific strategies (i.e. negative beliefs regarding symptoms and help-seeking, potential sources of help-seeking). This information was then collated, and common themes that emerged across language groups were selected. Following this, specific materials were developed for inclusion in the intervention and presented to members of the CAB. These were collaboratively refined across language groups, with a view to maximizing cultural relevance while keeping materials broadly consistent across languages. Finally, CAB members piloted the intervention and provided feedback on specific materials, resulting in further refinement of the intervention.

Statistical analyses

A power analysis using Gpower indicated that a sample size of 74 participants in total was required to detect a between-group effect size of 0.3 on self-stigma for PTSD at follow-up ($\alpha = 0.05$). We powered to detect a small- between-groups effect size following stigma reduction research which has found the strategies implemented in this study yielded small to medium between-group effect sizes (Clement *et al.*, 2012; Mittal *et al.*, 2012; Thornicroft *et al.*, 2016). We recruited 103 participants to allow for attrition. We used *t* tests and χ^2 tests to examine between-group differences on baseline characteristics (see Table 1). We used a series of multilevel models (conducted using SPSS Mixed, IBM SPSS Statistics Version 25) to examine change in outcome measures in the TYS and WLC groups over time. For each model, time was specified as a level 1 predictor, and treatment condition was specified as a level 2 predictor, with the intercept being allowed to vary randomly across participants. An unstructured covariance matrix was specified. We investigated separate models for (1) change during treatment (i.e. from pre- to post-treatment assessment), and (2) maintenance (i.e. from post-treatment to follow-up assessments). All participants who had completed at least one assessment point were included, and consistent with intent to treat analyses, participants were included in their randomized group irrespective of the number of modules they had completed. Poisson regression analyses were conducted to investigate the number of new sources of help-seeking in the prior 2 weeks at

https://doi.org/10.1017/S0033291719000606 Published online by Cambridge University Press

post-intervention and follow-up, with multiple imputation ($n = 20$ datasets) being used (in SPSS) to account for missing data. We determined between-group effect sizes at post-treatment and follow-up for the mixed models analysis (Cohens d) by calculating the mean difference between intervention conditions and dividing by the pooled standard deviation. Cohens d values of 0.8, 0.5 and 0.2 represent large, medium and small effects, respectively (Cohen *et al.* 1998). Finally, linear regression analyses were conducted to determine whether, for individuals in the TYS group, the number of modules completed predicted self-stigma for PTSD, self-stigma for seeking help, and help-seeking intentions at post-treatment and follow-up over and above baseline. Poisson regression analyses were undertaken to determine whether, for individuals in the TYS group, the number of modules completed predicted the number of new sources of help accessed in the past2 weeks.

In addition, we conducted exploratory moderation analyses to examine whether baseline PTSD, depression or anxiety symptoms impacted on the efficacy of the TYS intervention. First, we conducted correlational analyses to examine whether baseline symptoms were associated with baseline self-stigma related to PTSD, self-stigma related to help-seeking, help-seeking intentions and help-seeking behaviors at baseline. Next, we used separate linear mixed-models to examine change in outcome measures in the TYS and WLC groups from pre- to post-intervention, and from post-intervention to follow-up. For each model, time was specified as a level 1 predictor, and treatment condition was specified as a level 2 predictor, with the intercept being allowed to vary randomly across participants. The moderator of interest (PTSD symptoms, depression symptoms and anxiety symptoms) was centered and included as a level 1 predictor, alongside two-way interactions (time × treatment condition; time × moderator; treatment condition × moderator) and a three-way interaction (time × treatment condition × moderator).

Results

Participants in the TYS and WLC group did not differ on any baseline characteristics (see Table 1). Participants in the TYS group completed a mean of 4.76 (S.D. = 3.86) modules in the online intervention (range 0–12, 0 modules $n = 5$, 1 module $n = 5$, 2 modules $n = 6$, 3 modules $n = 16$, 4 modules $n = 4$, 7 modules $n = 5$, 10 modules $n = 2$, 11 modules $n = 11$). Means and standard deviations of study variables at each time-point are presented in Table 3. All participants in this study had been exposed to at least one type of PTE (mean = 7.5, S.D. = 4.17, range = 1–16), with commonly-endorsed events including being close to death ($n = 75$, 72.8%), lack of food or water ($n = 64$, 62.1%), being tortured ($n = 36$, 35.0%) and witnessing the murder of family or friends ($n = 32$, 31.1%). Participants had a mean level of PTSD symptoms of 18.17 (S.D. = 14.27). A DSM-5 derived algorithm revealed that 18.4% ($n = 19$) of participants met criteria for a probable diagnosis of PTSD, and 44.7% ($n = 46$) of participants met criteria for intrusive symptoms and one other PTSD symptom cluster (i.e. sub-syndromal PTSD).

Impact of TYS intervention on self-stigma for PTSD, self-stigma for help-seeking and PTSD symptoms

Mixed-models results are presented in Table 4. Linear mixed models analyses revealed that there were no significant effects for self-stigma for PTSD[†1]. There was a significant time × condition interaction for self-stigma for help-seeking. Inspection of study means suggested that participants in the WLC condition showed significantly greater increases in self-stigma for help-seeking from post-to follow-up, compared to those in the TYS condition ($d = -0.42$). There were no significant effects of time, condition or time × condition interaction for PTSD symptoms.

Impact of TYS intervention on help-seeking intentions

Linear mixed models analyses revealed that there was a significant time × condition interaction for help-seeking intentions, indicating that participants in the TYS condition showed greater decreases in help-seeking intentions from post to follow-up assessments relative to the WLC condition ($d = -0.27$).

Impact of TYS intervention on actual help-seeking

Poisson regression analyses indicated that there was no significant difference between groups in number of new sources of help accessed in the 2 weeks prior to post-treatment (TYS: mean = 0.65, S.D. = 0.84, WLC mean = 0.63, S.D. = 0.77, $B = 0.11$, S.E. = 0.23, Wald C^2 95% CI −0.34 to 0.56, $p = 0.641$). Participants in the TYS group accessed significantly more sources of help in the 2 weeks prior to the follow-up assessment compared to the WLC (TYS: mean = 0.65, S.D. = 0.85, WLC: mean = 0.47, S.D. = 0.78; $B = 0.69$, S.E. = 0.25, 95% CI 0.19 to 1.18, $p = 0.007$).

Association between modules completed and study outcomes

Linear regression analyses indicated that, for participants in the TYS condition, there was no significant association between the number of modules completed and self-stigma for PTSD, self-stigma for seeking help or help-seeking intentions at post-treatment or follow-up, over and above baseline levels of these variables. There was a trend, however, for individuals who had completed more modules to show lower levels of self-stigma relating to PTSD at follow-up ($B = -0.50$, S.E. = 0.29, $\beta = -0.20$, $p = 0.09$). Poisson regression analyses indicated that, for participants in the TYS condition, completing more modules was associated with greater help-seeking in the past 2 weeks at follow-up ($B = 0.10$, S.D. = 0.44 $p = 0.022$).

Moderator analyses

Correlation analyses indicated that baseline PTSD anxiety and depression symptoms were associated with greater self-stigma related to PTSD, greater self-stigma related to help-seeking and lower help-seeking intentions at baseline. There was no association between these symptoms and the number of help-seeking sources accessed in the previous 2 weeks (see Supplementary Table A).

Linear mixed-models analyses indicated that neither PTSD nor depression symptom severity moderated the impact of the TYS intervention on self-stigma for PTSD, self-stigma for help-seeking nor help-seeking intentions from baseline to post-intervention, or from post-intervention to follow-up assessments. There was, however, a significant three-way interaction between time, condition and anxiety symptoms from post- to follow-up assessment. Estimated marginal mean comparisons with Bonferroni corrections

[†]The notes appear after the main text.

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indicated that participants in the WLC group with low anxiety symptoms (1 standard deviation below the mean) showed significant increases in help-seeking intentions from post-treatment to follow-up assessment (mean difference = 6.45, S.E. = 1.92, $F_{(1, 39.39)} = 11.23$, $p = 0.002$). This pattern was not observed for individuals high in anxiety in the WLC group nor for those in the TYS condition (see Supplementary Tables B to D).

Poisson regression analyses indicated that baseline PTSD, depression and anxiety symptoms did not significantly moderate the impact of the intervention on help-seeking behaviors at post-intervention or follow-up (Supplementary Table E).

Program usability

Data on program usability revealed that approximately two-thirds of participants accessed the program via smartphone. Overall, participants found the program easy to use, attractive, easy to understand and useful. Almost all participants found the program to be interesting and engaging, and that the information provided was relevant and useful (see Table 5).

Discussion

To our knowledge, this study represents the first evaluation of an intervention designed to target mental health stigma and help-seeking in refugees. Results indicated that refugee men who received the TYS intervention showed greater help-seeking behaviors in the month following the intervention than those in the WLC, and smaller increases in self-stigma related to help-seeking compared to those in a WLC, with effect sizes being small-to-moderate. These findings provide evidence that an online intervention implementing the evidence-based principles of psychoeducation, social contact and cognitive reappraisal can impact positively on stigma in refugee men and may promote active help-seeking , which is consistent with the broader literature on mental health stigma reduction (Mittal *et al.*, 2012; Clement *et al.*, 2015; Thornicroft *et al.*, 2016). This is an important finding, as it suggests that the implementation of a short, online intervention can be effective in changing help-seeking behaviors in refugee men. Low-cost, scalable, interventions that do not require clinician input represent a promising avenue, especially given the growing number of forcibly displaced persons worldwide.

The finding that participants in the TYS condition had accessed significantly more sources of support between post-intervention and follow-up than the WLC group provides evidence that the intervention was effective in increasing help-seeking behavior. This finding is notable as previous studies have found that behavior change is especially difficult to elicit via self-stigma interventions (Thornicroft *et al.*, 2016). The impact of the TYS intervention on help-seeking behaviors may be attributable to numerous aspects of the program; for example, the positive help-seeking experiences by the men who featured in the TYS videos may have provided concrete examples of the potential benefits of help-seeking. Alternatively, cognitive reappraisal strategies may have directly challenged negative beliefs about help-seeking. Future research should examine the relative effectiveness of specific strategies on improving aspects of mental health stigma and help-seeking amongst refugees.

The pattern of results in this study suggests that individuals in the WLC group showed increases in self-stigma related to seeking help from post-treatment to follow-up, while this pattern was not observed in the TYS group. This provides preliminary evidence that the TYS intervention may have been protective against natural increases in self-stigma related to seeking help from professional sources for mental health problems over this short-term time-frame. It may be the case that, as refugees reside in the host country for a longer period of time, and initial links with supportive services are severed, there is an increasing reluctance to seek help for psychological symptoms from professional sources. Providing individuals with an intervention focused on self-stigma related to help-seeking may serve, via social contact and cognitive reappraisal, to challenge negative beliefs regarding these actions, and prevent these from developing. This hypothesis is highly speculative, particularly given the brief follow-up period in this study, and further longitudinal research is required to disentangle the mechanisms underlying this finding.

It is notable that the TYS intervention influenced self-stigma related to seeking help, but not PTSD-related mental health stigma. One possible explanation for this relates to the collectivist cultural backgrounds of participants in this study. Research has shown that collectivism predicts mental health stigma across cultural groups (Papadopoulos *et al.* 2013), with individuals from collectivist cultures being more focused on the social repercussions *v.* individual benefits of seeking help for mental health concerns (Kirmayer, 1989; Bettmann *et al.* 2015; Shannon *et al.* 2015). It may be the case that negative beliefs about being perceived to seek help were more salient for participants in this study than negative beliefs about the psychological symptoms themselves, leading to the intervention having a greater influence on the latter. This is consistent with the finding that the self-blame subscale of the self-stigma for PTSD scale did not correlate with the other subscales in the measure. Self-blame items in this scale focused on negative beliefs about symptoms in relation to the self (i.e. *'If I had symptoms of traumatic stress, I would think I should be stronger'; 'If I had symptoms of traumatic stress, I would think I had only myself to blame'*). This is distinct from other subscales that focused more on fear of other's perceptions of one's symptoms (shame: i.e. *'If I had symptoms of traumatic stress, I would feel embarrassed*), social repercussions (social inadequacy: i.e. *'If I had symptoms of traumatic stress, I would feel like a burden to other people'*) and concerns regarding help-seeking (help-seeking inhibition: i.e. *'I would feel embarrassed if others knew I was seeking help for post-traumatic stress'*). Further research should investigate the phenomenology of mental health stigma amongst refugees to aid the identification of core intervention targets relating to self-stigma. Alternatively, the finding that the intervention influenced self-stigma related to help-seeking but not PTSD may be attributed to the sample in the current study. To be included in the study, participants had only to report at least one clinically-significant PTSD symptom. While this was intended to promote help-seeking in individuals with trauma-related distress rather than only those with a PTSD diagnosis, this may have led to participants having lower levels of self-stigma related to PTSD than might otherwise be expected. This is consistent with our finding that PTSD symptoms severity was correlated with self-stigma for PTSD at baseline. This may account for why the change was not observed in self-stigma related to PTSD over time (although it is notable that participants who completed more modules showed a trend to lower levels of self-stigma related to PTSD at follow-up). Replication of these findings in a sample where all participants met diagnostic criteria for PTSD would assist in determining the underlying cause of these findings.

In addition, it is possible that other sample-related factors may have influenced results in this study. All participants in this study were male, and most had arrived in Australia relatively recently. It

https://doi.org/10.1017/S0033291719000606 Published online by Cambridge University Press

Table 5. Program usability

Item	Range	Mean (s.d.)	Proportion agreed
How did you usually access the TYS website?			Computer/laptop: 29.5% Tablet: 4.5% Smartphone: 53.7%
Overall, how easy did you find the program to use?	1 = very difficult 5 = very easy	4.27 (0.76)	*Easy, very easy* *n* = 44, 100%
The website pages were attractive	1 = strongly disagree 5 = strongly agree	3.98 (0.66)	*Agree, Strongly agree* *n* = 38, 86.4%
The website was easy to understand	1 = strongly disagree 5 = strongly agree	4.05 (0.61)	*Agree, Strongly agree* *n* = 39 88.7%
The website provided useful information and advice	1 = strongly disagree 5 = strongly agree	4.02 (0.51)	*Agree, Strongly agree* *n* = 39, 88.6%
The video stories were interesting	1 = strongly disagree 5 = strongly agree	3.86 (0.70)	*Agree, Strongly agree* *n* = 32, 72.7%
The examples provided were relevant to me	1 = strongly disagree 5 = strongly agree	3.61 (0.69)	*Agree, Strongly agree* *n* = 26, 59.1%
Using the program tended to put me in a positive mood	1 = strongly disagree 5 = strongly agree	3.64 (0.61)	*Agree, Strongly agree* *n* = 27, 61.3%
Using the program tended to put me in a negative mood	1 = strongly disagree 5 = strongly agree	2.02 (0.79)	*Agree, Strongly agree* *n* = 2, 4.5%
The program took too long to do	1 = strongly disagree 5 = strongly agree	2.43 (0.79)	*Agree, Strongly agree* *n* = 5, 11.4%
Overall, how interesting and engaging was the program?	1 = Not at all 4 = Extremely	2.84 (0.68)	*A little bit, quite a bit, extremely* *n* = 44, 100% *Quite a bit, extremely* *n* = 30, 80.2%
Overall, how relevant was the information for you?	1 = Not at all 4 = Extremely	2.50 (0.70)	*A little bit, quite a bit, extremely* *n* = 43, 97.7% *Quite a bit, extremely* *n* = 19, 43.2%
Overall, how useful was the information for you?	1 = Not at all 4 = Extremely	2.80 (0.72)	*A little bit, quite a bit, extremely* *n* = 43, 97.7% *Quite a bit, extremely* *n* = 26, 59.1%
How much did you enjoy using the program?	1 = Not at all 4 = Extremely	2.73 (0.79)	*A little bit, quite a bit, extremely* *n* = 43, 97.7% *Quite a bit, extremely* *N* = 25, 56.8%

may be the case, for example, that negative beliefs regarding help-seeking are particularly important for refugee men, which is consistent with research suggesting that men from a refugee background are less likely to seek help for mental health problems than women (Gilgen *et al.*, 2005; Marshall *et al.*, 2006). This is also in accordance with a broader literature suggesting that help-seeking rates are lower for men than women across psychological disorders (Addis and Mahalik, 2003), and for PTSD specifically (Maguen *et al.*, 2012), and linking this to gender norms, in particular related to masculinity (Lane and Addis, 2005; McDermott *et al.* 2010; Street and Dardis, 2018; Valenstein-Mah *et al.*, 2019). If negative beliefs about help-seeking are an especially salient barrier for men with posttraumatic stress symptoms, this raises the possibility of targeted gender-specific interventions representing the optimal way to elicit behavior change in this population. Further research regarding specific mechanisms of change in help-seeking behavior across gender groups is required to determine whether this is the case. Further, study results may have been influenced by connections with services commonly facilitated amongst recently-arrived refugees; potentially reducing perceptions of stigma as individuals discuss current needs with service providers. It is possible that these experiences may have led to greater reductions in negative beliefs about PTSD symptoms themselves across conditions, but not specific beliefs relating to seeking help from formal mental health services to reduce these symptoms, which could have thus been more strongly affected by the intervention. A more systematic study of mental health stigma amongst male and female refugees at different stages in the resettlement process would be beneficial to provide more detailed information on mental health stigma in these populations.

A surprising finding in this study was that help-seeking intentions showed greater increases from post-intervention to follow-up assessment in the WLC group compared to the TYS group. Upon initial consideration, these findings seem to be at odds with the finding that individuals in the WLC group showed greater increases self-stigma related to seeking help from post-intervention to follow-up. It is important to note, however, that self-stigma related to seeking help, as measured in this study,

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focused on professional help-seeking for posttraumatic stress symptoms, while help-seeking intentions was conceptualized as discussing emotional problems with a variety of informal and formal sources. Accordingly, we saw that individuals in the WLC group simultaneously seemed to show increases in willingness to discuss emotional problems across a variety of sources, and increases in self-stigma related to professional help-seeking. One possible explanation for these findings may relate to the finding that the TYS group showed greater actual help-seeking, rather than intended help-seeking than the WLC at this same assessment point. It may be the case that participants in the TYS group reported less need for help-seeking in the subsequent 4 weeks as they had already engaged important sources of support in the previous weeks. In contrast, participants in the WLC condition had been informed that they would have access to the intervention in the coming weeks, which may have resulted in an increase in intended help-seeking behavior from a number of sources, by virtue of expectations of receiving the intervention, but not specific reductions in negative beliefs regarding seeking professional help over this short time-frame. It may be the case that, as access to the intervention became imminent, participants in the WLC group either anticipated that the program may involve discussing emotional problems with others, or showed greater readiness to seek help. Further research on mechanisms of change in both conditions is required to determine the underlying reasons for this result. While the availability of the intervention to the WLC group is a limitation of the study design, we were motivated to ensure that all participants had equal access to the intervention. Future studies may include a time lag between the final assessment and the provision of an intervention in a design where the control group gets access to the intervention to rule out this possibility, in addition to a longer follow-up assessment period. It is also notable that this pattern was moderated by anxiety, such that individuals in the WLC group with lower levels of anxiety reported increases in help-seeking intentions, but not those with high anxiety. This finding provides preliminary evidence that there were no naturalistic increases in help-seeking intentions in individuals with high levels of psychological symptoms who did not receive the intervention. Future studies would benefit from longer-term and more nuanced investigation of help-seeking intentions to elucidate this association.

It is notable that the rates of completion of the intervention were relatively low in this study, with participants in the TYS condition completing a mean of 4.74 modules, and only 20% of participants completing all 11 modules. This is likely to be a methodological artifact, as participants were only permitted to complete three modules per week, to allow for time to process the material in the modules. It may be the case that, if participants were able to complete modules at their own pace, greater adherence would have been observed. Given our finding that greater help-seeking behavior was associated with completing more modules, and that reductions in self-stigma related to PTSD had a trend to be associated with greater module completion, future studies may benefit from removing exclusions on how many modules participants could complete over time. Alternatively, it may be the case that an intervention with 11 modules was considered too burdensome for participants. While only 10% of participants reported that they felt the program took too long to do, reducing the number of modules may have been associated with greater adherence and outcomes.

There are several limitations associated with this study. First, our sample size precluded us from investigating differences between the language groups in terms of the intervention's effectiveness. Second, considerable efforts were made to ensure that participants were engaged with the study, including via telephone. While the frequency of contact was not different across treatment conditions, this does not allow us to draw conclusions about the effectiveness of the TYS intervention in the absence of contact with a research staff member. The requirement of a phone screen to take part in the study may have resulted in the inadvertent exclusion of individuals who were reluctant to engage by phone due to very high levels of self-stigma. In addition, the online modality and interactive activities may have resulted in those individuals with the greatest disability related to psychopathology being unable or unwilling to participate (i.e. due to concentration difficulties, memory problems, lack of motivation etc). Third, this intervention was limited to male refugees, and thus results cannot be generalized to female refugees. Fourth, while our study found significant changes in stigma related to help-seeking and increases in help-seeking, the sample size in this study may have been inadequate to detect more subtle effects, with smaller effect sizes. Fifth, the follow-up assessment period in this study was relatively short (one month), which precluded the investigation of medium to long-term change, and may have introduced logistical challenges to observing effects (i.e. the difficulty of securing an appointment with a mental health professional or acting on planned behaviors within this timeframe). The implementation of a longer follow-up period (i.e. 6–12 months) would have allowed for investigation as to whether the intervention led to any enduring effects on stigma or behaviors. Sixth, we had uneven representation in the language groups in this study. Seventh, our measurement of actual help-seeking was limited to the number of sources of support accessed in the 2 weeks prior to assessment periods. This did not allow for a more nuanced investigation of a number of factors of interest, for example, number of sources accessed within a particular category, frequency of support-seeking and depth of support-seeking relationship. Eighth, data were not available on the date of arrival of participants in Australia nor time since exposure to traumatic events, thus it was not possible to examine the influence of these factors on study outcomes. Ninth, participants in this study had varying levels of severity of posttraumatic stress symptoms, and the rate of probable PTSD diagnosis was relatively low. While this increases the generalizability of findings across a broad range of refugees experiencing symptoms of traumatic stress, it would also be useful to investigate the efficacy of the intervention for the subgroup of individuals who meet full criteria for PTSD. Finally, the control group employed in this study was a WLC, which does not rule out the findings from the study being explained by those in the TYS group engaging with relevant and salient material on an online platform, rather than the specific strategies implemented in the intervention.

Taken together, these results suggest that the TYS intervention is effective in influencing self- stigma related to help-seeking and increasing help-seeking behavior amongst refugee men. Enhancing access to evidence-based mental health interventions for traumatized refugees represents an important public health priority. By addressing salient barriers to help-seeking such as mental health stigma, there is the potential to reduce the devastating mental health burden of posttraumatic stress on refugees.

Note

[1] Note that mixed-models analyses across individual subscales of the self-stigma for PTSD measure were also conducted, and revealed no significant main effects or interactions. Results can be obtained from the first author.

https://doi.org/10.1017/S0033291719000606 Published online by Cambridge University Press

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0033291719000606

Acknowledgements. This study was funded by a research grant from beyondblue with donations from the Movember Foundation. The authors would like to acknowledge the contribution to this study of Settlement Services International, Lillian Le, Amber Hamilton, Amitabh Rajouria, Jacinto Santamaria, Cesar Anonuevo, Nicole Cockayne, Rachael Thornton, Corrin Grant, Phillipa Specker, Joel Hoffman, Tobias Spiller, Anneliese Todellaro and language, casework and counselling services in Australia.

We are grateful to members of both the Steering Committee and Community Advisory Boards for their contribution to this study. We would especially like to thank the refugee men who shared their stories in the videos featured in the intervention, and to the refugee men who took part in this study.

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