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BASIC RESEARCH ARTICLE

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Online training for evidence-based child trauma treatment: evaluation of the German language TF-CBT-Web

Barbara Kasparik [a], Laura B. Saupe [a], Svenja Mäkitalo[a] and Rita Rosner [b]

[a]Department of Psychology, Catholic University Eichstätt-Ingolstadt Ingolstadt, Germany; [b]Department of Psychology, Catholic University Eichstätt-Ingolstadt Eichstätt, Germany

ABSTRACT

Background: Evidence-based trauma-focused interventions for treating PTSD in children and youth are barely used in practice. Web-based training has proven to be an effective way of transferring knowledge to healthcare professionals.
Objective: TF-CBT Web is a web-based training programme designed to foster the dissemination of Trauma Focused Cognitive Behavioural Therapy (TF-CBT) for children and youth, and is run by the Medical University of South Carolina. This paper describes the characteristics of healthcare professionals who registered for the adapted German language version of TF-CBT Web. It evaluates the effectiveness and user friendliness of the programme.
Method: : Similar to the TF-CBT treatment manual, the German language TF-CBT Web contains 12 modules. Between 2018 and 2020, 4,020 users registered for the programme. During the registration process users provided demographic information. The knowledge of users regarding the TF-CBT components was assessed via pre-tests and post-tests in each module.
Results: The programme was accessed by a sample of mostly German users with varying professional health care backgrounds and a wide-ranging spread of work experience. The results indicated a significant knowledge gain and high rates of user satisfaction with the programme.
Conclusions: In summary, the results of this study suggested that web-based training is an effective and well-accepted method for knowledge gain in trauma-focused interventions. Future research should evaluate the actual application of the taught methods in clinical practice.

Capacitación en línea para el tratamiento del trauma infantil basado en la evidencia: evaluación del TF-CBT-Web en alemán

Antecedentes: Las intervenciones centradas en el trauma basadas en la evidencia para tratar el TEPT en niños y jóvenes apenas se utilizan en la práctica. La capacitación basada en la web ha demostrado ser una forma efectiva de transferir conocimientos a los profesionales de la salud.
Objetivo: TF-CBT Web es un programa de capacitación basado en la web, diseñado para fomentar la difusión de la Terapia cognitiva conductual centrada en el trauma (TF-CBT por sus siglas en ingles) para niños y jóvenes, y está a cargo de la Universidad Médica de Carolina del Sur. Este artículo describe las características de los profesionales de la salud que se registraron en la versión alemana adaptada del TF-CBT Web. Evalúa la eficacia y la facilidad de uso del programa.
Método: Similar al manual de tratamiento de TF-CBT, el sitio web de TF-CBT en alemán contiene 12 módulos. Entre 2018 y 2020 se registraron 4.020 usuarios en el programa. Durante el proceso de registro, los usuarios proporcionaron información demográfica. El conocimiento de los usuarios sobre los componentes de la TF-CBT se evaluó mediante pruebas previas y posteriores en cada módulo.
Resultados: El programa fue completado por una muestra de usuarios en su mayoría alemanes con diferentes antecedentes profesionales en el cuidado de la salud, y una amplia variedad de experiencia laboral. Los resultados indicaron una ganancia de conocimiento significativa y altos índices de satisfacción de los usuarios con el programa.
Conclusiones: En resumen, los resultados de este estudio sugirieron que la capacitación basada en la web es un método efectivo y bien aceptado para adquirir conocimientos en intervenciones centradas en el trauma. La investigación futura debe evaluar la aplicación real de los métodos enseñados en la práctica clínica.

循证儿童创伤治疗在线培训: 德语版 TF-CBT-Web 评估

背景: 用于治疗儿童和青少年 PTSD 的循证聚焦创伤干预实践中几乎没有使用。在线培训已被证明是向医疗保健专业人员传授知识的有效方式。

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Trastorno de estrés postraumático; terapia centrada en el trauma; TF-CBT; capacitación basada en la web; difusión

关键词
创伤后应激障碍、聚焦创伤治疗、TF-CBT; 在线培训、宣传

HIGHLIGHTS

- Children and adolescents with PTSD require trauma-focused treatment. However, evidence-based interventions for this patient population are barely used. Therefore, it is necessary to expand professional training for the treatment of traumatised children and adolescents.
- Our evaluation showed the effectiveness and feasibility of a web-based training programme for mental health practitioners in an evidence-based treatment for children and youth with PTSD (TF-CBT). Results show a significant knowledge gain of users who participate in the web-based training programme.
- The user satisfaction survey also revealed that users found the modus and content of the web-based training applicable and relevant for their clinical practice.

CONTACT Barbara Kasparik barbara.kasparik@ku.de Department of Psychology, Catholic University Eichstätt-Ingolstadt, Levelingstraße 7, 85049 Ingolstadt, Germany

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目的: TF-CBT Web 是一个旨在培养宣传儿童和青少年聚焦创伤认知行为疗法 (TF-CBT)的在线培训计划, 由南卡罗来纳医科大学运营。本文描述了注册了德语版 TF-CBT Web 的医护专业人员特征。它评估计划的有效性和用户友好性
方法: 与TF-CBT治疗手册类似, 德语版TF-CBT Web包含12个模块。 2018 年至 2020 年间, 有 4,020 名用户注册了该计划。在注册过程中, 用户提供了人口统计信息。通过每个模块中的前测和后测评估用户对 TF-CBT 成分的了解。
结果: 该计划的访问者大多是具有不同专业医护背景和广泛工作经验的德国用户。结果表明, 该计划获得了显著的知识增益和较高的用户满意度。
结论: 总之, 本研究结果表明, 在线培训是一种可以在聚焦创伤干预中获取知识的有效且广为接受的方法。未来研究应该评估所教授方法在临床实践中的实际应用。

1. Introduction

Experiencing traumatic events negatively impacts the development, psychopathology, and general functioning of children and adolescents (Saunders & Adams, 2014). Traumatic experiences during childhood are risk factors for psychopathology later in life. Children with PTSD have been found to display high functional impairment which, in most cases, does not improve unless treated (Danese, McLaughlin, Samara, & Stover, 2020; Hiller et al., 2016; Lewis et al., 2019; Schaefer et al., 2018). Despite findings from a British epidemiological study showing that 31.1% of young people have experienced at least one traumatic event in their life, and 7.8% have developed PTSD symptoms by the age of 18, only 20% of children and adolescents with PTSD received support from mental health practitioners (Lewis et al., 2019). These findings show that PTSD-specific assessments and treatments are scarce in clinical practice: many children with trauma-related psychopathology remain undetected and without any access to adequate care (Danese et al., 2020). There is, therefore, an urgent need for the expansion of both the professional training and the clinical capacity for the treatment of traumatised children and adolescents (Danese et al., 2020; Lewis et al., 2019).

In recent years numerous evidence-based psychological treatments (EBTs) for PTSD have been developed and evaluated. EBTs for children and adolescents with PTSD consist mainly of trauma-focused approaches, including the well-established trauma-focused cognitive behavioural therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006). A recent paper reported large effects ($SMD = -1.17$) of TF-CBT in reducing PTSD symptoms in comparison to a waitlist condition (Mavranezouli et al., 2020). Despite its effectiveness, various studies have shown that most children and adolescents with PTSD do not have access to evidence-based treatment (Hintzpeter et al., 2014; Kröger, Kliem, Bayat Sarmadi, & Kosfelder, 2010; Smith, Dalgleish, & Meiser-Stedman, 2019). There are two main reasons for this. Firstly, the use of EBTs in clinical practice is still relatively limited (Beidas et al., 2019; Institute of Medicine, 2015). Secondly, a large number of mental health care professionals do not have the basic clinical knowledge or the clinical skills to deliver standard treatments for PTSD (Rosen, Ruzek, & Karlin, 2017). There are various reasons for the poor use of guideline-based treatments of children and adolescents with PTSD: incorrect assumptions of therapists (e.g. overestimation of the effectiveness of stabilisation without confrontation by therapists), therapists' fears with regard to conducting the treatment (e.g. concern about the conduct of trauma confrontation, impact of narration on one's own mental state), inadequate training opportunities or the sole availability of time-intensive training programmes, and a lack of systematic support for such training programmes from employers and the healthcare system (Cook, Dinnen, Simiola, Thompson, & Schnurr, 2014; Herschell, Kolko, Baumann, & Davis, 2010; Neuner, 2011; Sansen et al., 2019). Morris, Wooding, and Grant (2011). estimated that it takes 17 years for EBTs to be implemented in clinical practice. This highlights the urgent need to disseminate effective PTSD treatments in routine clinical care (O'Connor, Morgan, Bailey-Straebler, Fairburn, & Cooper, 2018).

Consequently, new strategies to ensure that evidence-based interventions reach young patients are very much needed (Smith et al., 2019). Research indicates that both the self-study of treatment manuals and in-person workshops without follow-up support are, for the most part, inadequate. These training approaches do not lead to an increase in the knowledge and skills of therapists. Nor do they ensure that EBTs are applied in practice (Herschell et al., 2010). As a relatively new but promising approach, online training programmes have been shown to improve therapists' knowledge and psychotherapeutic skills in the short-term. In a systematic review Jackson, Quetsch, Brabson, and Herschell (2018). differentiate between five types of web-based training methods for the dissemination of EBTs: (1) The *virtual classroom*, a group-based learning approach with a facilitator who provides the content for users (average effect size for knowledge $g = .61$, skills $g = 1.2$). (2) *Serial instruction*, a linear learning programme in which all users work on the same content in the same way (average effect size for knowledge of $g = 1.29$, skills $g = .15$, self-efficacy $g = .78$, use $g = .65$). (3) *Self-directed learning* where users select modules and content according

to their interests (knowledge $g = .29$, skills $g = .22$). (4) *Simulation training* where users interact with virtual patients (average effect size knowledge $g = 2.03$, skills $g = 1.75$). (5) *Ongoing support* which includes consultation or supervision in addition to a learning programme (average effect size of support vs. no support g = -.04). Positive effects on completion, knowledge, attitudes towards the treatment, skills, and fidelity were observed for all approaches (Jackson et al., 2018). Research indicates that web-based training programmes followed by consultations are just as effective, in terms of knowledge and skills acquisition, as in-person workshops followed by consultations conducted by experts (German et al., 2018; Kobak, Wolitzky-Taylor, Craske, & Rose, 2017; Taylor et al., 2021).

In addition to their resource effectiveness, web-based training methods have several advantages. Online training programmes have less impact on work and personal life, thus enabling users to work through the programme flexibly and at their own pace (Khanna & Kendall, 2015; Rosen et al., 2017). They also provide access to a greater number of clinicians, especially in rural areas (Rosen et al., 2017). Web-based programmes have a high level of feasibility and acceptability. They also increase knowledge about treatment techniques (Heck, Saunders, & Smith, 2015). Moreover, online training programmes are able to foster competencies and change attitudes towards a treatment procedure, which both point to a willingness to treat patients with the specific intervention (Sansen et al., 2019). Another advantage of online formats is that they allow for the video-based presentation of patient-therapist interactions, which offer realistic insight into therapy sessions (Khanna & Kendall, 2015; Rosen et al., 2017). Users of web-based training programmes can repeatedly access the material; this may lead to more sustainable use of the treatment methods. Web-based training programmes can also be regularly updated thus enabling them to keep pace with the latest scientific findings (O'Connor et al., 2018). Lastly, web-based training programmes also lead to a sustainable use of the treatment by mental health care practitioners (Jackson et al., 2021).

To date, most e-learning programmes for the treatment of PTSD cater for an English-speaking audience. One prominent example is TF-CBT WEB, the online training for TF-CBT, a web-based and guideline recommended EBT for PTSD (Heck et al., 2015). To the best of the authors' knowledge, there is currently one evaluated e-learning course (ECQAT; Sansen et al., 2019) in the German language. However, ECQAT does not focus on the specifics of one EBT manual but gives more of an overview of different effective treatment aspects (e.g. cognitive intervention, exposure). The present study, therefore, set out to establish and evaluate an adapted and extended German version of TF-CBT Web called 'TF-KVT Web' for the treatment of PTSD in children and youth, which is tailored to the German healthcare landscape (https://tfkvt.ku.de).

The first objective of the present study was to describe both the user characteristics and the general characteristics of users who completed the German language TF-CBT Web, to examine which occupational groups could be reached with such a programme, and to evaluate use of the programme. The second objective was to evaluate the user friendliness of the German language TF-CBT Web. The third and final objective was to evaluate the knowledge gain of users in each module, and to compare knowledge gain between completers and non-completers.

2. Method

2.1. The German language TF-CBT Web online training

TF-CBT (Cohen et al., 2006) is an evidence-based trauma-focused intervention for children and adolescents and is included in the PTSD treatment guidelines (National Institute for Health and Care Excellence, 2018). From 2005 to 2018, the free online TF-CBT learning platform of the Medical University of South Carolina was available for English-speaking mental healthcare professionals. Starting in 2018, the participants were charged a fee. The original online course consisted of 11 modules. More than 300,000 users worldwide used this platform during the first ten years of its existence (Heck et al., 2015). For the current study, a German version of the learning programme was developed. The content was optimised to suit the specific conditions of the German healthcare system that differs vastly from the US-American one (e.g. diagnosis within the course of probationary sessions, adjustment of the session content to a single 50-minute session). Since 2018, the German language TF-CBT Web has been available to the general public free of charge.

Similar to the TF-CBT treatment manual, the German language TF-CBT Web contained 12 modules (see Table 1). Compared to the English programme, the German language TF-CBT Web included more background information and an additional module for diagnostics with publicly accessible diagnostic instruments, along with additional worksheets and videos. As a result of increased migration movements from the Middle East and the African continent to Europe in 2015, extended material for refugees in different languages was added. TF-CBT Web is a self-directed learning programme. Each module started with a four-question knowledge test. After the user had viewed the contents of the module, the same four questions were presented as a post-test.

Table 1. Modules of the German language TF-CBT Web.

Number	Name of the Module
1	Foundations
2	Diagnostic
3	Psychoeducation
4	Parenting skills
5	Relaxation techniques
6	Affect expression and modulation
7	Cognitive coping strategies
8	Trauma narrative
9	Cognitive processing
10	In vivo exposition
11	Conjoint parent-child sessions
12	Improving future safety and development

Once the post-test had been processed, access to the next module was unlocked. Over the course of the entire learning programme, each user thus completed a total of 12 pre- and post-tests.

All modules started with an introduction video containing a short description of the technique. The modules then included step-by-step instructions for applying the technique in a therapeutic setting. In addition, various video demonstrations of the techniques with patient actors (e.g. psychoeducation with the mother of a 9-year-old girl who had experienced sexual abuse) were included. Moreover, the modules comprised recommendations for exercises, and worksheets in different languages. Furthermore, they contained practical information on caregiver sessions. Each chapter described culture- and age-specific aspects, as well as common challenges in clinical practice. All learning content was provided via the content management system typo3 on a website exclusively on a platform used solely for the German TF-CBT Web.

2.2. Ethics

In Germany, a general ethics commitment to epidemiology and consumer surveys was agreed (www.adm-ev.de), that allows the conduct of single projects without specific ethical approval, as long as the principles of this commitment for epidemiological, social and consumer satisfaction purposes were accepted (e.g. only use of fully anonymized data for the specific purpose). These principles were observed. Participants were clinicians who volunteered their participation; no explicit consent was required in the participating countries.

2.3. Participants

The present study included participants who signed up for the German language TF-CBT Web. The programme was advertised in various psychotherapeutic journals and at conventions (e.g. 'Psychotherapeuten Journal', Convention 'Deutsche Gesellschaft für Psychotraumatologie'). Due to the dissemination approach of the programme, the programme was publicly available to anyone interested in the psychotherapeutic treatment of traumatised children and adolescents. Between January 1, 2018 and December 31, 2020, 4,020 users signed up for the German language TF-CBT *Web*. The final study sample consisted of three different sub-samples: (1) any mental health professionals (licenced psychotherapists, psychotherapists in training, and psychiatrists) who enrolled independently, (2) German and Swiss university students who had to complete the programme as part of their psychology curriculum, (3) licenced psychotherapists who took part in two large German TF-CBT dissemination projects called BETTER CARE and BEST FOR CAN (Rosner et al., 2020; Rosner et al., 2020), who needed to complete the German language TF-CBT Web in order to participate in the study. A more detailed description of the sample characteristics is provided in the results section.

2.4. Measures and procedure

During the registration process, users provided descriptive information, such as first and last name, state and country of origin, professional training (psychology, social work, counselling, nursing staff, psychiatry, family counselling), highest academic qualification (abitur, diploma, bachelor, master, PhD, licence to become a professor, state examination, other), qualification (licence to practice medicine, completed training for therapeutic approaches not recognised by German health insurance system, started training for non-guideline procedure, started training for guideline procedure, completion of training, psychotherapy in line with the 'Heilpraktikergesetz', no professional qualification) and years of professional experience (less than 5 years, 5–10 years, 10–20 years, more than 20 years). Knowledge acquisition in each module was measured by the change in percentage of correct answers from pre-test to post-test. The questions were based on the main content of the modules and were taken from the English language TF-CBT Web (e.g. 'Which of the following statements best applies to the therapeutic approach in the psychoeducation module?'). To assess internal consistency, Cronbach's alpha was calculated for the pre- and post-tests, which is satisfying with Cronbach's alpha = .69 for pre-tests and .74 for post-tests. After finishing all the modules, users were asked to complete a user satisfaction questionnaire (online supplementary). The questionnaire included 12 items about the user-friendliness of the programme (e.g 'The online learning programme was easy to navigate and I found my way around.', 4-point likert scale, 1-4), 10 questions on knowledge transfer of TF-CBT methods (e.g. 'This online learning programme helped me understand the TF-CBT methods.', 4-point likert scale), 3 questions on the

users intent to apply TF-CBT in future practice (e.g. 'Through this online learning programme, I will likely use TF-CBT with many of my patients.'), and 4 questions on the availability of support for participating in the German language *TF-CBT Web* (e.g. 'Was your course participation supported by your employer/ supervisor/organizer through time off, crediting of training time, etc.?'). The items of the user satisfaction evaluation were adapted from surveys of other learning programmes for psychotherapists (see Sansen et al., 2019), but have unfortunately not been evaluated elsewhere. The internal consistency for each subscale in the present studies sample was satisfying given the number of items (user-friendliness: Cronbach's alpha = .75, (12 items); knowledge transfer: Cronbach's alpha = .86 (9 items); intent to apply TF-CBT: Cronbach's alpha = .66 (3 items).

2.5. Data analysis

Statistical analysis was conducted using the Statistical Package for the Social Sciences SPSS 26.0. Frequency counts were used to describe the characteristics of both registered users and completers of the German language TF-CBT Web. A binary logistic regression was performed in order to evaluate the impact of profession, highest qualification, and work experience on the completion of the web-based training. To assess the likelihood of users dropping out in a specific module, the frequencies of completion of each module were calculated. Knowledge acquisition in each module was evaluated by calculating differences in percentage between pre-test and post-test scores. In addition, 12 paired sample t-tests were conducted using the pre-test and post-test scores of users to determine knowledge gain in the training modules. These analyses were run for the whole sample and for the completers of the programme. User satisfaction was evaluated by calculating the sum scores for each subcategory. To avoid alpha inflation all p values were Bonferroni-Holm corrected.

3. Results

3.1. User characteristics

All 4,020 users provided demographic information. Most of the users in the sample came from Germany (92.4%, $n = 3714$), followed by Switzerland (5.4%, $n = 217$) and Austria (1.5%, $n = 1.5\%$). They were predominantly psychologists (65.4%, $n = 2630$). The majority of the users reported that their highest qualification was a diploma (29.3%, $n = 1177$) or master's degree (26.5%, $n = 1065$). About two-thirds (64.7%, $n = 2601$) of the users had less than 5 years' work experience. For a detailed description of the user characteristics, see Table 2.

The average number of days from registration to completion of the programme was 95.9 days ($SD = 151.4$). Users were deemed to be completers of the German language TF-CBT Web if they downloaded the completer's certificate at the end of the programme. In total, 1,410 (35.1%) of the users completed the training programme. In the sample of non-student users ($n = 3,230$), a total of 1,017 users completed the programme, which is equivalent to a completer rate of 31.5%. The completer rate of non-student users in relation to the total sample ($N = 4,020$) was 25.3%. Users were deemed to be completers of individual modules as soon as they processed the post-test of a module. 1,819 users (45.2%) completed the first six modules, and 1,565 users (38.9%) completed 11 modules of the German language TF-CBT Web. The highest dropout was between the first and the second modules. For a more detailed history of the use of each module, see Figure 1.

Users who completed the web-based training were mainly from Germany (91.1%, $n = 1270$), were psychologists (64.6%, $n = 911$), and had a diploma (24.2%, $n = 314$) or master's degree (29.4%, $n = 414$). A quarter (25.2%, $n = 355$) of all users who completed the German language TF-CBT Web had a licence to practice medicine. Most (70.1%, $n = 989$) of the completers had less than five years' work experience.

The results of the binary logistic regression analyses are given in Table 3. The binomial logistic regression model was statistically significant, $\chi^2(13) = 123.23$, $p < .05$ (Nagelkerke's $R^2 = .04$, Cox & Snell's $R^2 = .03$). Compared to psychologists, social workers (OR .60, CI .46, .80, $p < .05$) or nursing staff (OR .61, CI .46, .79, $p < .05$) were less likely to complete the German language TF-CBT Web. However, counselours were more likely to complete the programme

Table 2. Characteristics of users of the German language TF-CBT Web.

Characteristics	User *n*	User in %
Profession		
Psychology	2630	65.4
Psychiatry	677	16.8
Social work	560	13.9
Family counselling	68	1.7
Counselling	54	1.3
Nursing staff	30	.7
Highest qualification		
Diploma*	1177	29.3
Master's degree	1065	26.5
Bachelor's degree	468	11.6
Licence to practice medicine	341	8.5
Abitur/ High school diploma	322	8.0
PhD	308	7.7
Licence to become a professor	11	.3
No degree	6	.1
Other	321	7.9
Work experience		
< 5 years	2601	64.7
5–10 years	706	17.6
10–20 years	465	11.6
> 20 years	248	6.2

*Academic degree, comparable to a Master's degree

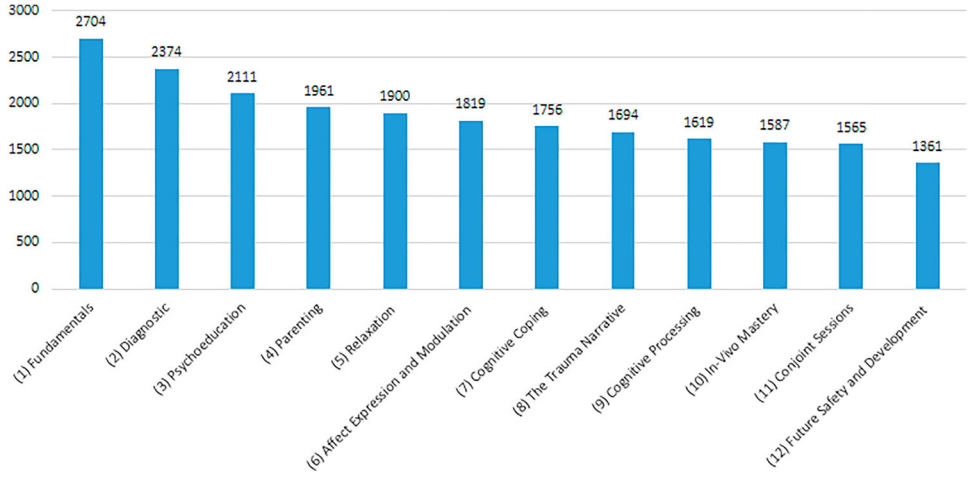

Figure 1. Completers per module.

(OR 1.82. CI 1.5, 2.16, $p < .05$). Neither being a psychiatrist (OR .93, CI .69, 1.25), a family counselour (OR .42, CI .05. 3.67) nor the highest academic qualification achieved by the user (PhD & licence to become a professor: OR .88, CI .72, 1.08; state examination: OR 1.18. CI .98, 1.42; licence to practice medicine OR .58, CI .27, 1.27; no degree OR .82, CI .48, 1.39; other degree OR .60, CI .32, 1.12) explained any additional variance in the regression analyses. The results also revealed that users with ten to twenty years' work experience (OR .76, CI .61, .95, $p < .05$) and those with more than twenty years' work experience (OR .73, CI .55, .99. $p < .05$) were less likely to complete the web-based training, compared to users with less than five years' work experience.The results of the binary logistic regression analyses are given in Table 3.

Table 3. Results of logistic regression: user characteristics associated with training completion.

Characteristics	95% CI for Odds Ratio					
	b	*SE b*	*p*	Lower	Odds Ratio	Upper
Profession (reference category: Psychologists)						
(1) Social work	−.51	.14	.00*	.46	.60	.80
(2) Psychiatry	−.07	.15	.63	.69	.93	1.25
(3) Nursing staff	−.50	.14	.00*	.46	.61	.79
(4) Family counselling	−.86	1.10	.44	.05	.42	3.67
(5) Counselling	.06	.09	.00*	1.5	1.82	2.16
Highest qualification (reference category: Diploma & Master's degree)						
(1) PhD & licence to become a professor	−.12	.10	.23	.72	.88	1.08
(2) State examination	.16	.09	.09	.98	1.18	1.42
(3) Licence to practice medicine	−.54	.40	.17	.27	.58	1.27
(4) No degree	−.20	.27	.45	.48	.82	1.39
(5) Other	−.51	.32	.11	.32	.60	1.12
Work experience (reference category: < 5 years)						
(1) 5–10 years	−.16	.09	.09	.71	.85	1.02
(2) 10–20 years	−.27	.11	.02*	.61	.76	.95
(3) > 20 years	−.30	.15	.04*	.55	.73	.99
Constant	−.60	.06	.00		.55	

Note. $R^2 = 0.03$ (Cox & Snell), 0.04 (Nagelkerke), Model χ^2 (13) = 123.23, *<.05

3.2. User satisfaction and circumstances while working on the German language TF-CBT Web

A total of 1,405 users (34.95%) completed the evaluation questionnaire after finishing the learning programme. The majority of users who answered these questions were psychologists (61.7%, $n = 867$), had a master's degree (29.4%, n = 413), and less than five years' work experience (70.0%, $n = 984$). For a more detailed description of the characteristics of this subsample, please refer to Table S2. Users rated user-friendliness and usability with an average score of 3.74 (*range* 2.42-4.00, $SD = .24$). The extent to which the programme helped in understanding TF-CBT methods was rated with a mean of 3.73 (*range* 2.00-4.00, $SD = .32$). The positive effect on the intent to apply TF-CBT attained an average score of 3.35 (*range* 1.00-4.00, $SD = .52$). One-third of respondents said they received support from their supervisor or employer (37.0%, $n = 520$), whereas 205 users (14.6%) did not. Just over one-quarter of the users said they had worked on the programme without their supervisor's knowledge (24.3%, $n = 342$). Another quarter (24.1%, $n = 338$) could not answer the question, because they were self-employed. 489 (34.8%) users indicated that their professional environment (e.g. colleagues) supported them whilst participating in the learning programme, 248 (17.7%) received no support from their professional environment, and 686 (48.8%) either worked independently or worked their way through the programme without their professional environment knowing about it. Nearly a quarter (23.9%, $n = 336$) of the respondents took advantage of other training programmes for PTSD treatment simultaneously to the German language TF-CBT Web. 22.6% ($n = 317$) users did not have access to other training opportunities, 6.7% ($n = 94$) did not use other training opportunities, and 46.8% ($n = 658$) did not find out about other training opportunities while participating in the online course.

Table 4. Knowledge gain per module in percent.

Module	Mean	*SD*
(1) Foundations	29.4	28.2
(2) Diagnostics	7.8	22.9
(3) Psychoeducation	4.4	23.1
(4) Parenting	10.7	27.2
(5) Relaxation	14.6	21.2
(6) Affect expression and modulation	8.8	24.3
(7) Cognitive coping	5.2	20.3
(8) The Trauma Narrative	23.4	28.8
(9) Cognitive processing	12.2	24.3
(10) In vivo mastery	15.4	23.8
(11) Conjoint sessions	11.2	21.5
(12) Improve future safety and development	4.6	25.9

3.3. Knowledge acquisition

Table 4 gives the knowledge gain of all users in percent. Knowledge increased significantly in each module of the German language TF-CBT Web. The greatest knowledge gain was observed in the modules 'Foundations' ($M = 29.4\%$, $SD = 28.2\%$) and 'The Trauma Narrative' ($M = 23.4\%$, $SD = 28.8\%$).

Results from the paired sample t-tests indicated that there was a significant gain in users' knowledge across all modules (see Table 5), with small effect sizes for example in the modules 'Diagnostic' and 'Psychoeducation', medium effect sizes for 'Relaxation', 'Cognitive Processing', 'In Vivo Mastery' and a large effect size for 'Foundations' and 'The Trauma Narrative'. Effect sizes were mostly consistent across both the sample of all users and the sample of completers (see Table 6). However, the completer sample had slightly larger effect sizes for knowledge gain.

4. Discussion

Given the high prevalence of PTSD in children and youth and the low level of application of evidence-based methods in the treatment of PTSD, the present study aimed to evaluate a German training programme for TF-CBT based on the manual by Cohen et al. (2006). In total, just over 4,000 people took advantage of the training programme in 2018-2020. With the onset of the COVID19 pandemic in the first half of 2020, we noted a substantial increase in new registrations. This increased demand for online training may be due to a lack of in-person training opportunities during this period. In line with the first aim of the present study, the course was accessed by a sample of mostly German users with various professional health care backgrounds and a wide range of work experience. One third of the 4,000 registered users of the German TF-CBT Web completed all 12 modules. This number is slightly lower than the completion rates found in other web-based programmes, which report completion rates of about 50% (Heck et al., 2015). However, if only those users who actually started studying the first module are considered ($n = 2704$), 50% of the users completed the German language TF-CBT Web. This is in accordance with the completer rates of the aforementioned studies. Parts of the data were collected at the time of the Covid19 pandemic. The particular pandemic situation may have had an impact on the dropout rates of the learning programme. The increased double burden of family and work, but also the increased demand for psychosocial services during the pandemic (Boldt et al., 2021; Dubey et al., 2020), could have made it difficult for users to complete the programme.

The highest drop-out rate was found between the first and second module. Thus, as they progressed through the programme, users were more likely to complete all modules. Unfortunately, we were not able to conduct a drop out analysis to gain insight into the motives for non-completion. However the larger drop-out rate at the beginning of the programme might be an indication that users tended to drop out because they realised at the start of the e-learning programme that they were either already familiar with the content, the content did not seem relevant to their clinical practice, did not fit their specific clinical needs, or the modus of online learning did not appeal to them (Postel, Haan, Huurne, Becker, & Jong, 2010). Future research should focus on the specific reasons for drop out from EBT online programmes. The analysis of the characteristics of users who completed the programme also revealed an effect of the type of profession and length of work experience on the completion of the German language TF-CBT Web. Users with many years of work experience were less likely

Table 5. Pre-test and post-test outcomes of all users in each of the 12 modules.

Module	pre-test Mean (*SD*)	post-test Mean (*SD*)	*t*	df	*p* Value	Cohen's *d*
(1) Foundations	1.86 (.97)	3.04 (.78)	54.14	2701	< .001	1.04
(2) Diagnostics	2.76 (.83)	3.07 (.82)	16.10	2220	< .001	.34
(3) Psychoeducation	2.90 (.87)	3.08 (.90)	8.69	2108	< .001	.19
(4) Parenting	2.60 (1.06)	3.02 (.91)	17.47	1959	< .001	.39
(5) Relaxation	3.06 (.94)	3.64 (.76)	29.99	1899	< .001	.69
(6) Affect expression and modulation	2.95 (.94)	3.30 (.81)	15.45	1818	< .001	.36
(7) Cognitive coping	3.12 (.88)	3.33 (.73)	10.71	1749	< .001	.26
(8) The Trauma Narrative	2.06 (1.10)	3.00 (1.03)	33.43	1693	< .001	.81
(9) Cognitive processing	2.22 (.96)	2.71 (.75)	20.20	1618	< .001	.50
(10) In vivo mastery	2.22 (.80)	2.84 (.82)	25.59	1555	< .001	.65
(11) Conjoint sessions	3.13 (1.01)	3.57 (.75)	20.54	1564	< .001	.52
(12) Improve future safety and development	2.65 (1.08)	2.83 (.78)	6.49	1360	< .001	.18

Table 6. Pre-test and post-test outcomes of completers in each of the 12 modules.

Module	pre-test Mean (*SD*)	post-test Mean (*SD*)	*t*	df	*p* Value	Cohen's *d*
(1) Foundations	1.84 (.97)	3.01 (.74)	41.82	1393	< .001	1.12
(2) Diagnostics	2.72 (.83)	3.08 (.81)	14.69	1369	< .001	.40
(3) Psychoeducation	2.92 (.86)	3.15 (.79)	10.69	1391	< .001	.29
(4) Parenting	2.60 (1.06)	3.07 (.83)	16.73	1389	< .001	.45
(5) Relaxation	3.10 (.86)	3.71 (.60)	26.80	1388	< .001	.72
(6) Affect expression and modulation	2.94 (.92)	3.31 (.79)	14.60	1388	< .001	.39
(7) Cognitive coping	3.11 (.87)	3.33 (.73)	10.21	1399	< .001	.27
(8) The Trauma Narrative	2.06 (1.08)	3.04 (.99)	32.51	1387	< .001	.87
(9) Cognitive processing	2.21 (.95)	2.73 (.73)	20.63	1387	< .001	.55
(10) In vivo mastery	2.23 (.78)	2.85 (.82)	25.23	1371	< .001	.68
(11) Conjoint sessions	3.16 (.97)	3.61 (.67)	19.57	1387	< .001	.53
(12) Improve future safety and development	2.67 (1.08)	2.84 (.75)	6.08	1239	< .001	.17

to complete all modules. This might be due to a confounding effect of the years of work experience and age. Older users might be less comfortable with a web-based learning programme, finding it thus less helpful.

We were able to show that the German language TF-CBT Web led to a significant knowledge gain about EBT for PTSD. The greatest effect sizes for knowledge gain were found in the modules 'Foundations' ($d = 1.04$) and 'The Trauma Narrative' ($d = .81$). This may be attributed to the fact that the content of these modules was highly specific to TF-CBT, whereas the content of other modules was more general and included less specific treatment techniques such as relaxation techniques, which users versed in cognitive behavioural treatment techniques might have already been familiar with. In the US version of TF-CBT Web, a large effect size was found for the module 'Creating the Trauma Narrative' ($d = .81$) as well. Large effect sizes were found in the modules 'Stress Management – Controlled Breathing' ($d = .85$), 'Stress Management – Thought Stopping' ($d = .91$). However, the effect size in the German version was only in the medium range for the module 'Relaxation' ($d = .69$). A difference was also observed for the psychoeducation modules: in the US version of TF-CBT Web a medium effect size ($d = .73$) was found, but in the German version only a small effect size ($d = .19$; Heck et al., 2015). Comparing the effect sizes of the two versions of the TF-CBT learning programme, some differences emerge. These differences could partly be due to the fact that about 75% of the users of the U.S. training programme had a master's degree, whereas only 55% of the present studies sample had a Master degree in clinical psychology (or the German equivalent of a 'Diplom'). In comparison to the German speaking sample, the U.S. sample was thus more homogeneous. In addition, only 15% of the American sample consisted of students of mental health programmes (Heck et al., 2015). The latter is important to note as the students of the German sample were enrolled in a broader psychology programme at their respective universities, which included other psychological subjects as well as clinical psychology. This difference is due to the specifics of the German Healthcare system in which psychologists start their specialised mental health training to become a licenced psychotherapists only after graduating with a more general psychology degree (Master or Diplom). Nevertheless, these results demonstrated that the German language TF-CBT Web was an effective tool in increasing mental health care professionals' knowledge of TF-CBT. They likewise demonstrated that the effectiveness of the German language TF-CBT Web was comparable to other web-based learning programmes (Jackson et al., 2018; Kobak, Craske, Rose, & Wolitsky-Taylor, 2013). Based on the significant knowledge gain and the high user satisfaction in each individual module, future studies may consider offering modules individually as well. This would enable users already trained in behavioural therapy to 'cherry pick' the content most valuable to their specific clinical practice and prior experience, resulting in a more individualised and resource-effective approach to disseminating TF-CBT in clinical practice. For example, individual modules with standard methods of behavioural therapy (e.g. relaxation, cognitive coping) could already be unlocked for this subsample and would thus not necessarily have to be processed. Even if individual modules are already unlocked, the structure of TF-CBT should be maintained in the programme. This approach could possibly also lower drop-out rates. The evaluation also showed high user satisfaction across the complete programme. The German language TF-CBT Web seemed to be a user-friendly and usable platform which helped the users understand TF-CBT-methods. Just one-third of the users surveyed received support from their employer and work colleagues when working on the programme. Embedding the web-based training in institutional framework conditions and further training offers might make it easier for users to participate and complete the programme.

Despite these encouraging results, the following limitations to the present study have to be noted:

Results were limited to users' self-reports on knowledge gain and intent to apply TF-CBT. No conclusions could be drawn about therapists' adherence to the manual or the extent to which practitioners put into practice the techniques they had learned after completing the programme. Future studies should follow up on TF-CBT treatments offered by programme completers as well as their adherence to the taught material. Furthermore, due to the self-enrolment of the participants, the representativeness of the findings is limited. It is likely that the sample was selective and consisted mainly of highly motivated mental health practitioners, especially given the large volume of study participants. Students participated in the learning programme during their curriculum and were, therefore, required to complete it. If this subgroup was excluded from the completer analysis, the completer rate was less than 30%. In addition, the subsample of students also had an impact on the low level of work experience among completers. In general, diverse sampling can have an impact on training outcomes. Another limitation was that, with regard to the profession of users, neither the therapeutic approach (cognitive behavioural/ psychoanalytical/ systemic) nor the patient target group (children and adolescents or adults) was recorded. In addition, it was not possible to provide precise information on the composition of the sample in terms of the age and gender of the users. This information would allow a more precise description of the user sample and provide further insights into the target interest groups of the German language TF-CBT Web. As mentioned above, no drop-out analyses were performed. A qualitative follow-up survey of users would have been desirable. In the user satisfaction survey, only 35% of completers answered the questions. It would be preferable for a larger number of users to answer these questions. Furthermore, the extent of support from supervisors or the organisation was not recorded for non-completers. Due to the single group pre–post-measures design, the learning programme cannot be compared to face-to-face training or other training modes. In addition, because of the design and evaluation at the module level, no conclusion can be drawn about whether online training is generally effective. However, it should be noted that the learning programme supports the implementation of TF-CBT in Germany. In two connected ongoing studies, the German TF-CBT-Web is used as a first step in training, and therapists participate in an additional workshop and a random selection of therapists will be assigned to supervision (Rosner et al., 2020a; Rosner et al., 2020b). This will allow to estimate the effectiveness of the various training modules in offering TF-CBT to patients with PTSD.

Despite these limitations the present study was able to show that web-based training methods for mental health care professionals were effective and helpful in teaching an EBT such as TF-CBT in German-speaking countries with their specific healthcare system. The web-based training was able to reach a large number of practitioners and to surmount the cost, time, and distance barriers often associated with in-person workshops. Web-based approaches may thus facilitate the implementation and dissemination of newly developed methods and might be – both individually or in the broader context of blended learning – an effective training tool for teaching EBTs (Ruzek et al., 2014). Future studies should evaluate the extent to which practitioners trained in TF-CBT actually apply the EBT techniques they have learned and follow the manual in clinical practice. In this way, the development of web-based training methods could encourage the dissemination of EBTs and thus improve the treatment of children and adolescents with PTSD in the long term.

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Data availability statement

For privacy reasons, the participants in this study did not agree to their data being shared publicly, so no support data are available.

ORCID

Barbara Kasparik http://orcid.org/0000-0003-1814-6879
Laura B. Saupe http://orcid.org/0000-0003-4825-1936
Rita Rosner http://orcid.org/0000-0002-7960-8398

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