Targeting dissociation using cognitive behavioural therapy in voice hearers with psychosis and a history of interpersonal trauma: A case series

Filippo Varese*[1,2] (iD), Maggie Douglas[3], Robert Dudley[3,4], Samantha Bowe[5], Thomas Christodoulides[3], Stephanie Common[6], Tim Grace[6], Victoria Lumley[6], Laura McCartney[3], Sonia Pace[3], Thomas Reeves[3], Anthony P. Morrison[1,5] (iD) and Douglas Turkington[7] (iD)

[1]Division of Psychology and Mental Health, School of Health Sciences, Manchester Academic Health Science Centre, University of Manchester, UK
[2]Complex Trauma and Resilience Research Unit, Greater Manchester Mental Health NHS Foundation Trust, Manchester Academic Health Science Centre, UK
[3]Cumbria, Northumberland, Tyne and Wear NHS Foundation Trust, Newcastle upon Tyne, UK
[4]School of Psychology, Newcastle University, Newcastle upon Tyne, UK
[5]Psychosis Research Unit, Greater Manchester Mental Health NHS Foundation Trust, Manchester Academic Health Science Centre, UK
[6]Tees Esk and Wear Valley, NHS Foundation Trust, Darlington, UK
[7]Institute of Neuroscience, Newcastle University, Newcastle upon Tyne, UK

Objectives. Previous studies have suggested that dissociation might represent an important mechanism in the maintenance of auditory verbal hallucinations (i.e., voices) in people who have a history of traumatic life experiences. This study investigated whether a cognitive behavioural therapy (CBT) intervention for psychosis augmented with techniques specifically targeting dissociative symptoms could improve both dissociation and auditory hallucination severity in a sample of voice hearers with psychosis and a history of interpersonal trauma (e.g., exposure to sexual, physical, and/or emotional abuse).

Design. Case series.

Methods. A total of 19 service users with psychosis were offered up to 24 therapy sessions over a 6-month intervention window. Participants were assessed four times over a 12-month period using measures of dissociation, psychotic symptoms severity, and additional secondary mental-health and recovery measures.

*Correspondence should be addressed to Filippo Varese, Division of Psychology and Mental Health, School of Health Sciences, University of Manchester, Zochonis Building, 2nd floor, Brunswick Street, Manchester M13 9PL, UK (email: filippo.varese@manchester.ac.uk).

Results. Sixteen participants engaged in the intervention and were included in last-observation-carried-forward analyses. Dropout rates were in line with those of other CBT for psychosis trials (26.3%). Repeated measures ANOVAs revealed large and significant improvements in dissociation ($d_{rm} = 1.23$) and hallucination severity ($d_{rm} = 1.09$) by the end of treatment; treatment gains were maintained 6 months following the end of therapy. Large and statistically significant gains were also observed on measures of post-traumatic symptoms, delusion severity, emotional distress, and perceived recovery from psychosis.

Conclusions. The findings of this case series suggest that the reduction of dissociation represents a valuable and acceptable treatment target for clients with auditory verbal hallucinations and a trauma history. Future clinical trials might benefit from considering targeting dissociative experiences as part of psychological interventions for distressing voices.

Practitioner points

- Practitioners should consider the role of dissociation when assessing and formulating the difficulties of voice hearers with a history of trauma.
- Techniques to reduce dissociation can be feasibly integrated within psychological interventions for voices.
- Voice hearers with histories of trauma can benefit from psychological interventions aimed at reducing dissociation.

Introduction

In recent years, growing evidence has confirmed that trauma (i.e., life events and circumstances that are experienced by the individual as physically or emotionally harmful and life threatening and that may have enduring adverse impacts on the individual's physical, emotional, or mental well-being; SAMHSA, 2014) represents a crucial risk factor for psychosis. A broad range of complementary research findings, including large-scale epidemiological studies (e.g., Shevlin *et al.*, 2013), prospective studies of trauma survivors (e.g., Cutajar *et al.*, 2010), prognostic research in at-risk groups (Brew, Doris, Shannon, & Mulholland, 2018), and comprehensive meta-analyses of longitudinal and retrospective investigations (Varese, Smeets, *et al.*, 2012) have confirmed that exposure to potentially traumatic life events (e.g., physical and sexual violence, emotional abuse, neglect, or bullying) dramatically increases the risk of developing psychotic symptoms. In parallel, a large body of evidence suggests that people with psychosis who have a history of trauma present with more severe and disabling psychotic symptoms, in particular positive symptoms of psychosis such as delusions and hallucinations (Bailey *et al.*, 2018; Stevens *et al.*, 2019).

Given the importance of trauma in psychosis, there has been a growing interest in the application of trauma-focused interventions in psychotic clients who present with comorbid trauma- and stress-related conditions, in particular post-traumatic stress disorder (PTSD). In recent clinical trials with patients with lifetime diagnosis of psychosis and (current) comorbid PTSD, trauma-focused interventions with a robust evidence base for the treatment of PTSD (prolonged exposure and eye movement desensitization and reprocessing) have been linked to reduced severity of post-traumatic symptoms (van den Berg *et al.*, 2015) and symptoms of psychosis (de Bont *et al.*, 2016). The effects of these treatments appeared more robust for delusions than auditory verbal hallucinations. A recent systematic review has largely confirmed these findings; trauma-focused therapies

can ameliorate symptoms of psychosis, but their effect on certain symptoms, in particular hallucinations, is negligible in most treatment studies (Brand, McEnery, Rossell, Bendall, & Thomas, 2018).

Targeting the psychological processes responsible for the increased vulnerability to specific psychotic experiences in individuals exposed to traumatic experiences represents a promising avenue for the development of more effective interventions for psychotic symptoms that may have a traumatic origin (e.g., Bentall *et al.*, 2014; Brand, Rossell, Bendall, & Thomas, 2017). Whilst the rationale for targeting comorbid PTSD is supported by a growing number of empirical studies indicating that 'hallmark' post-traumatic symptoms mediate the observed association between trauma exposure and presence/severity of symptoms of psychosis (Hardy *et al.*, 2016), cognitive-behavioural avoidance, hyperarousal, and re-experiencing symptoms represent only some of the possible post-traumatic sequelae that could influence psychosis vulnerability and maintenance (Williams, Bucci, Berry, & Varese, 2018). Dissociation has been increasingly investigated as a potential mediator of the relationship between trauma and psychotic experiences, and multiple studies suggests that this effect is particularly robust in the context of auditory verbal hallucinations (i.e., hearing voices; Pearce *et al.*, 2017; Varese, Barkus, & Bentall, 2012; Williams *et al.*, 2018). Defined in the DSM-5 as 'a disruption of and/or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control and behaviour (that) can potentially disrupt every area of psychological functioning' (p. 291; American Psychiatric Association, 2013), dissociation is a term used to describe a range of altered states of consciousness and perception which includes relatively benign forms of psychological and/or attentional disengagement (e.g., experiences of absorption) as well as more pervasive and potentially distressing experiences such as derealization, depersonalization, and identity alteration. These experiences are not only central to specific psychiatric diagnoses (e.g., dissociative identity disorder), but are also observed in the context of numerous other psychiatric presentations, including psychosis (Lyssenko *et al.*, 2017; O'Driscoll, Laing, & Mason, 2014).

Proposals that dissociation may represent a response to trauma, or even a 'defence mechanism' used by individuals to minimize the distress experienced when faced with overwhelming life circumstances, have received apparent empirical support by a range of cross-sectional and longitudinal studies indicating a robust association between trauma and dissociative experiences (Dalenberg *et al.*, 2012). Furthermore, recent meta-analytic evidence indicates that dissociation is related to having a history of trauma in people with psychosis (Rafiq, Campodonico, & Varese, 2018). In parallel, research studies have suggested that the presence of dissociative experiences is linked to increased vulnerability to hearing voices. Using meta-analytic methods, Pilton, Varese, Berry, and Bucci (2015) found a large and robust association between dissociation and voices, observed not only in samples of patients with psychosis, but also other diagnostic groups. Findings from an experience sampling study indicate that increased levels of state dissociation predict hallucinatory episodes in the daily lives of people with psychosis (Varese, Udachina, Myin-Germeys, Oorschot, & Bentall, 2011). Furthermore, dissociation predicts the persistence of voices in longitudinal studies of children who hear voices (Escher *et al.*, 2004), and the onset of hallucinatory experiences in prospective studies with adult trauma survivors (Geddes, Ehlers, & Freeman, 2016).

Whilst dissociation seems to be a key process in trauma and in voice hearing, the theoretical underpinnings of the relationship between these constructs are poorly delineated in the literature. Some authors have argued that a radical shift is needed in the

way hallucinatory experiences are conceptualized by researchers and clinicians, as hallucinations in people with psychosis may be 'traumatic in origin and dissociative in kind' (p. 521; Moskowitz, Read, Farrelly, Rudegeair, & Williams, 2009). Other authors have backed more mechanistic perspectives, for example that dissociation, either at the time of the trauma or in response to current cues or reminders of past trauma, could increase confusion between inner and outer experiences, making individuals more vulnerable to voices and other hallucinatory experiences (e.g., Allen, Coyne, & Console, 1997), or that heightened states of dissociation may interact with pre-existing cognitive vulnerabilities for voices (such as source monitoring biases affecting the capacity to correctly identify the source of internally and externally generated cognitive events; Varese, Barkus, *et al.*, 2012).

Consequently, dissociation might represent a promising treatment target for psychological therapies aimed at improving voices in individuals with an history of adverse life experiences (Berry, Bucci, & Varese, 2019). Dissociation is often not sufficiently considered in manualized CBT interventions for psychosis (CBTp). Furthermore, the acceptability of cognitive behavioural change strategies for the management of dissociative experiences and the 'added value' of considering dissociation in the context of CBTp interventions for distressing voices have not been carefully examined to date. The current study was designed to address this knowledge gap. It examined the impact of a CBT intervention for voices (Morrison, Renton, Dunn, Williams, & Bentall, 2004) specifically modified to include therapeutic techniques suitable for individuals with trauma and dissociative experiences (Kennerley, 1996; Larkin & Morrison, 2005; Newman-Taylor & Sambrook, 2013). More specifically, using a case series design, we examined whether the intervention could ameliorate dissociative symptoms and auditory hallucinations severity as well as a range of secondary outcome measures, including delusions severity, post-traumatic symptoms, emotional distress, and perceived recovery from psychosis.

Method

Participants

Participants were recruited from community mental health teams and early intervention (EI) services in the North East of England. All participants met the following eligibility criteria: (1) received support from community mental health services and had an identified care coordinator; (2) met ICD-10 criteria for schizophrenia, schizoaffective disorder, or delusional disorder or met criteria for first-episode psychosis used within their local EI service; (3) history of voice hearing for a minimum of six months; 4) were 16 years or older; (4) scored $\geq$ 2 on the frequency item and ≥ 3 on distress intensity items of the auditory hallucinations subscale of the Psychotic Symptoms Rating Scales (PSYRATS-AH); (5) scored $\geq$ 1 on any of the items of the expanded version of the Brief Betrayal Trauma Survey (BBTS-14) assessing lifetime exposure to interpersonal trauma (i.e., items 3–11); and (6) presented with potentially clinical significant levels of dissociative symptoms, as indicated by a score> 20 on the Dissociative Experiences Scale (DES; Carlson & Putnam, 1993). All participants had capacity to provide informed consent and were judged by their referring clinician to be clinically stable in the preceding 4 weeks. Referring clinicians also provided diagnostic information to confirm trial eligibility. Furthermore, eligible participants had to confirm that they regarded voices, dissociation, or trauma-related symptoms as their main presenting difficulty and that they wished to receive a

psychological intervention specifically targeting these problems. Participants were not eligible from this study if their experience of voices/psychosis was attributable to organic causes (e.g., traumatic brain injuries), had insufficient command of English to complete the research interviews and measures, had a primary diagnosis of substance misuse dependency, or were receiving acute inpatient care at the time of referral.

Measures

The expanded version of the Brief Betrayal Trauma Survey (BBTS-14; Goldberg & Freyd, 2006) is a 14-item scale assessing exposure to potentially traumatic experiences. The scale includes separate items assessing potentially traumatic interpersonal events (e.g., exposure to sexual and physical violence; emotional and psychological mistreatment) as well as non-interpersonal events. For each event, respondents indicate the extent of their exposure both prior to and after the age of 18 using a 3-point scale (0 = never; 1 = one or two times; 2 = more than that).

The Dissociative Experiences Scale (DES; Carlson & Putnam, 1993) is a 28-item questionnaire assessing dissociative experiences. Respondents select a percentage ranging from 0 to 100% to indicate how frequently each item is experienced. The overall DES score is obtained by averaging the 28 item scores, yielding a score ranging from 0 to 100. The DES has been to shown to have very good validity and reliability, and good overall psychometric properties in many studies (e.g., van Ijzendoorn & Schuengel, 1996; Lyssenko *et al*., 2017). In this case series, to better capture changes in dissociation over the course of treatment, we assessed the frequency dissociative experiences experienced by participants in the previous month using a 'time bound' version of DES (the DES-t; Freyd, Klest, & Allard, 2005).

The Psychotic Symptoms Rating Scale (PSYRATS; Haddock, McCarron, Tarrier, & Faragher, 1999) is a clinical interview assessing physical, cognitive, and emotional features of the auditory hallucinations and delusions experienced by the participant in the preceding week. The auditory hallucinations subscale of the PSYRATS (PSYRATS-AH) comprises 11 items assessing several dimensions of auditory verbal hallucinations on a 5-point scale ranging from 0 to 4. The delusions subscale of the PSYRATS (PSYRATS-Del) included six items assessing features of delusional beliefs on a similar 5-point scale. The PSYRATS has demonstrated good psychometric properties in studies with both first-episode (e.g., Drake, Haddock, Tarrier, Bentall, & Lewis, 2007) and 'chronic' psychotic patients (e.g., Haddock *et al*., 1999). In this study, the total PSYRATS-AH and PSYRATS-Del scores were used as aggregate measures of hallucination severity and delusion severity, respectively.

The Impact of Events Scale Revised (IES-R; Weiss & Marmar, 1996) is a 22-item questionnaire assessing post-traumatic symptoms, including arousal, hypervigilance, and intrusions. Respondents were asked to anchor their responses to the most difficult life event identified using the BBTS-14 and indicate how much they were affected by each symptom in the previous week using a 5-point scale (0 = 'not at all'; 4 = 'extremely'). The IES-R has good psychometric properties and has been used in several studies with psychosis samples (e.g., Bendall, Alvarez-Jimenez, Hulbert, McGorry, & Jackson, 2012).

The short Depression, Anxiety and Stress Scales (DASS-21; Lovibond & Lovibond, 1995) is a 21-item questionnaire designed to assess emotional distress, including symptoms of anxiety, depression, and stress. Participants are required to rate the extent to which they experienced symptoms in the past week on a 4-point scale (0 = 'Did not apply to me at all'; 3 = 'Applied to me very much or most of the time'). The measure has

demonstrated good validity and internal consistency in previous studies with non-clinical hallucination-prone samples (e.g., Badcock, Chhabra, Maybery, & Paulik, 2008) as well as psychiatric patients with psychotic experiences (e.g., Ng *et al.*, 2007).

The Questionnaire about the Process of Recovery (QPR; Neil *et al.*, 2009) is a 15-item self-report questionnaire assessing perceived recovery from psychosis-related difficulties. Participants are asked the QPR items using a 5-point Likert scale (0 = 'disagree strongly'; 4 = 'agree strongly'). The measure was developed in collaboration with people with lived experience of psychosis; it has good psychometric properties and has been used as an outcome measure in several clinical trials of psychological therapies for psychosis (e.g., Morrison *et al.*, 2018).

The short-form of the CHoice of Outcome In Cbt for psychosEs (CHOICE; Greenwood *et al.*, 2009), a service user-led outcome measure, is developed to evaluate outcomes of CBTp interventions. Participants are required to rate a range of domains frequently targeted in psychological interventions for psychosis (e.g., their self-confidence; their ability to deal with everyday stress) in the previous week on an 11-point scale (0 = 'worst'; 10 = 'best'). The measure has been employed in previous CBTp trials, demonstrating good psychometric properties and sensitivity to change (e.g., Freeman *et al.*, 2015).

Intervention

Participants were offered up to 24 sessions of CBT over a 6-month period. The intervention was delivered by a team of nine experienced clinical psychologists and CBT therapists in the context of their routine clinical practice in secondary care community services. All therapists had core CBT training and experience of working with clients with psychosis and trauma-related difficulties before starting the trial. All therapists received one day of training at the onset of the study, to familiarize themselves with the intervention and its rationale. Following the initial training, they had access to monthly trial-specific group supervision. The treatment plan closely followed CBTp approaches with an established evidence base (Morrison, 2017; Morrison *et al.*, 2004), but the intervention was modified to have a preferential focus on dissociative experiences during assessment and formulation of clients' difficulties and to systematically include therapeutic techniques targeting dissociative symptoms/responses associated with trauma. In this respect, the intervention expanded upon previous case studies that considered dissociation in the context of psychosis (Larkin & Morrison, 2005; Newman-Taylor & Sambrook, 2013). The cognitive framework described by Larkin and Morrison (2005) was used to guide the formulation of clients' difficulties, and to emphasize the potential role of dissociation as (1) a possible post-traumatic sequela that may be involved in the development of psychotic experiences, and (2) a cognitive behavioural response involved in the maintenance of psychotic experiences (see Figure 1).

Although designed to be flexible and adaptable to clients' needs, the intervention comprised four phases which therapists were encouraged to follow through ongoing supervision and the completion of adherence measures following each therapy session. Sessions 1–4 were focused on engagement, cognitive behavioural assessment of presenting problems, identification of treatment goals and when appropriate normalization/psychoeducation on dissociative responses, trauma and/or psychosis. In sessions 5–14, clients were introduced to and practiced a range of techniques to manage dissociative responses and/or increase perceived controllability of dissociation. These included a range of strategies commonly used in psychological interventions with clients presenting with pervasive dissociative experiences, including identification of triggers, low arousal
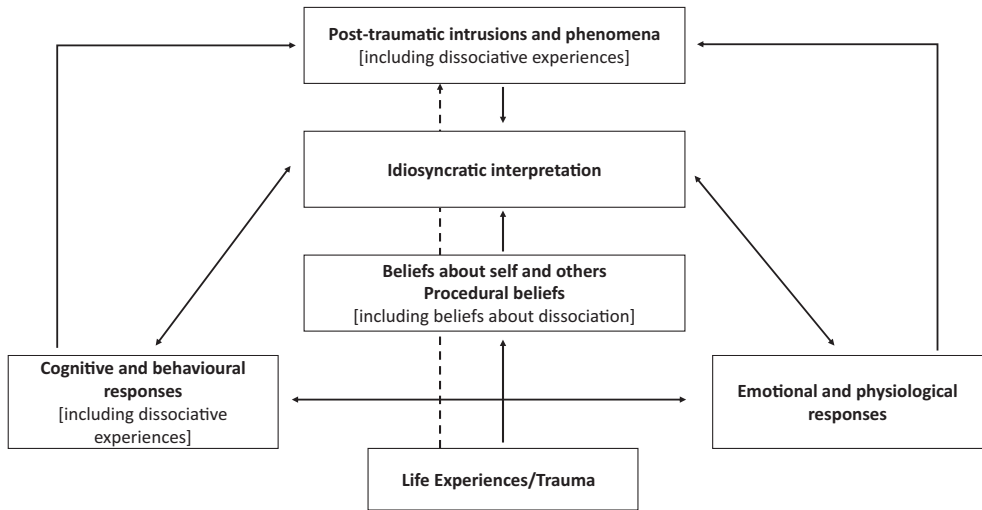
Figure 1. The adapted cognitive model proposed by Larkin and Morrison (2005), used in this study to highlight the role of dissociation in the maintenance of clients' difficulties and to guide the delivery of the intervention.

strategies, distress tolerance, and grounding techniques (e.g., Kennerley, 1996; Linehan, 1993). Although further work on dissociation and/or trauma was encouraged, the targets for intervention in subsequent sessions (15–22) and the strategies selected depended on individual formulation of clients' difficulties and negotiation with the client (i.e., the acceptability of the proposed work). This could include re-appraisals on negative beliefs about dissociative experiences, cognitive and/or behavioural change strategies targeting core appraisals of voices leading to related distress, trauma-related techniques (e.g., imagery techniques, cognitive restructuring work informed by cognitive therapy for post-traumatic stress), or consolidation of a developmental/longitudinal psychological formulation of the client's difficulties. The final two sessions were dedicated to the development of plans for relapse prevention and maintenance of gains. An applied example of this treatment approach is described in a previously published case study [reference removed for anonymity purposes].

Procedure

The study was approved by an NHS Research Ethics Committee and the Health Research Authority. Participants were referred to the study by a member of their clinical team and were assessed for eligibility by a trained research assistant. After providing informed consent, participants completed a battery of baseline measures comprising the PSYRATS, the DES, and the abovementioned questionnaires. Following the completion of these initial assessments, participants were allocated to a study therapist in their locality. Participants were assessed using the same battery of measures (except for the BBTS-14, which was administered only at baseline) on three subsequent occasions, at mid-treatment (approximately 3 months after the baseline assessment), at the end of treatment (6 months after baseline), and again at 6 months following the end of treatment. All research assessments were conducted by a graduate research assistant during face-to-face meetings with study participants.

Statistical analyses

In line with the overall rationale for the proposed intervention (i.e., that dissociation may represent a post-traumatic sequela involved in the maintenance of voices), measures of dissociation (DES scores) and auditory hallucinations (PSYRATS-AH) were used as co-primary outcomes in our analyses. A series of repeated measures analyses of variance (ANOVA) were carried out to examine differences between baseline, mid-therapy, and end-of-therapy assessment points on the abovementioned primary outcomes measures and additional secondary outcomes (IES-R, PSYRATS-Del, DASS-21, QPR, and CHOICE). As end of treatment was our primary end point, no inferential tests considered data gathered at the 6-month follow-up assessments; however, these data are presented descriptively to estimate whether any treatment gains were maintained following the end of treatment. Post-estimation tests were conducted to compare mid-therapy and end-of-therapy scores against baseline scores; effect sizes for these comparisons were quantified using the formula for estimating the standardized mean difference for repeated measures design (Cohen's d_{rm}, see Lakens, 2013). When data violated the assumption of normality for repeated measures ANOVA, Friedman's test was employed to analyse changes in the outcome of interest over time, and follow-up comparisons were conducted using the Wilcoxon signed-rank test.

The above analyses only considered participants who actively engaged in treatment. In line with the structure of our phased protocol, treatment engagement was defined as receiving five or more sessions (as sessions 1-4 focused on treatment engagement and initial psychoeducation on trauma, dissociation, and psychosis). This cut-off is similar to that used to identify treatment non-engagement in past randomized controlled trials of CBTp (Dunn *et al.*, 2012). For those that did engage, the last-observation-carried-forward (LOCF) method was used to impute missing data on relevant mid-therapy and end-of-therapy outcome variables. LOCF-corrected descriptive statistics for the current sample are reported in Table S1 (Supporting Information). All analyses were conducted using SPSS version 23.

Results

Sample characteristics

Nineteen participants were recruited. The demographic and clinical characteristics of the sample are displayed in Table 1, and the flow of participants in the different phases of the study is illustrated in Figure 2.

Inspection of the baseline data indicated high level of trauma exposure and trauma-related symptoms in this sample. On the BBTS-14, participants reported having been exposed to an average of nine different traumatic events. Of note, BBTS-14 scores indicated that all participants were exposed to multiple experiences of interpersonal abuse in both childhood and adulthood. All participants reported having been emotionally or psychologically mistreated over a significant period of time; the majority of the sample also reported having survived physical assaults sufficiently severe to cause bodily injuries and episodes of sexual violence, including incidents of childhood sexual abuse. Most participants had IES-R scores suggestive of possible PTSD diagnosis (i.e., 84.2% had scores >33) and DES scores suggestive of levels of dissociation similar to those observed in samples with PTSD or dissociative disorders (Lyssenko *et al.*, 2018).

Table 1. Sample characteristics ($N = 19$)

Age	$M = 28.1$	$SD = 9.6$	Range 16–45	
Illness duration	$M = 11.5$	$SD = 9.5$	Range 0.3–32	
Traumatic events	$M = 8.9$	$SD = 4.5$	Range 2–17	
	Emotional/psychological maltreatment exposure	19 (100%)	Sexual violence exposure	13 (68.4%)
	Physical violence exposure	14 (73.7%)	Childhood sexual abuse	11 (57.9%)
Employment	Unemployed	11 (57.9%)	Employed	4 (21.1%)
	Studying	4 (21.1%)		
Sex	Male	8 (42.1%)	Female	11 (57.9%)
Setting	EI services	13 (68.4%)	Other	6 (31.6%)
Diagnoses	Schizophrenia	5 (26.3%)	Unspecified non-organic psychosis	14 (73.7%)

Note. EI = Early intervention for psychosis.

Study retention and treatment engagement

Table 2 displays descriptive statistics for the primary and secondary outcome variables at the four time points of the study. As can be seen, study retention at the end of treatment was acceptable (26.3% drop out rate), but with greater missing data at the 6-month follow-up (36.8%). In terms of treatment engagement, three participants attended less than five therapy sessions. The remaining 16 participants attended an average of 17.6 sessions (range 5–24), with five participants attending all sessions offered as part of this case series.

### Does the intervention impact dissociation and voices?

A repeated measure ANOVA was carried out to examine differences in dissociation scores across baseline, mid-therapy, and end-of-treatment assessment points. The results indicated that DES significantly decreased over the course of treatment; $F(2, 14) = 15.681$, $p < .001$, partial $n^2 = .511$. Post-estimation tests indicated that that there were significant differences between baseline and mid-therapy DES scores ($p = .002$; $d_{rm} = 0.966$) as well as between baseline and end-of-treatment DES scores ($p < .001$; $d_{rm} = 1.230$).

As the PSYRATS-AH scores at the mid-therapy assessment were negatively skewed ($z_{skewness} = -3.97$), Friedman's test was used to examine changes in hallucinations severity over time. The results indicated significant reductions in the severity of auditory hallucinations over the course of the study; $\chi^2(2) = 17.93$, $p < .001$. Post-hoc analyses with Wilcoxon signed-rank tests indicated that PSYRATS-AH scores decreased significantly between baseline and mid-therapy assessments ($Z = -3.02$, $p = .003$; $d_{rm} = 0.656$), with a more robust difference being observed between baseline and end of therapy ($Z = -3.30$, $p = .001$; $d_{rm} = 1.087$).

Inspection of the descriptive statistics of 6-month follow-up DES and PSYRATS-AH scores indicated no deterioration in voices or dissociation, suggesting that treatment benefits were maintained.

Does the intervention impact secondary outcomes?

The analysis focusing on post-traumatic symptoms indicated that IES-R scores significantly decreased over the course of the study; $F(2, 13) = 16.02$, $p < .001$, partial $n^2 = .534$. Post-
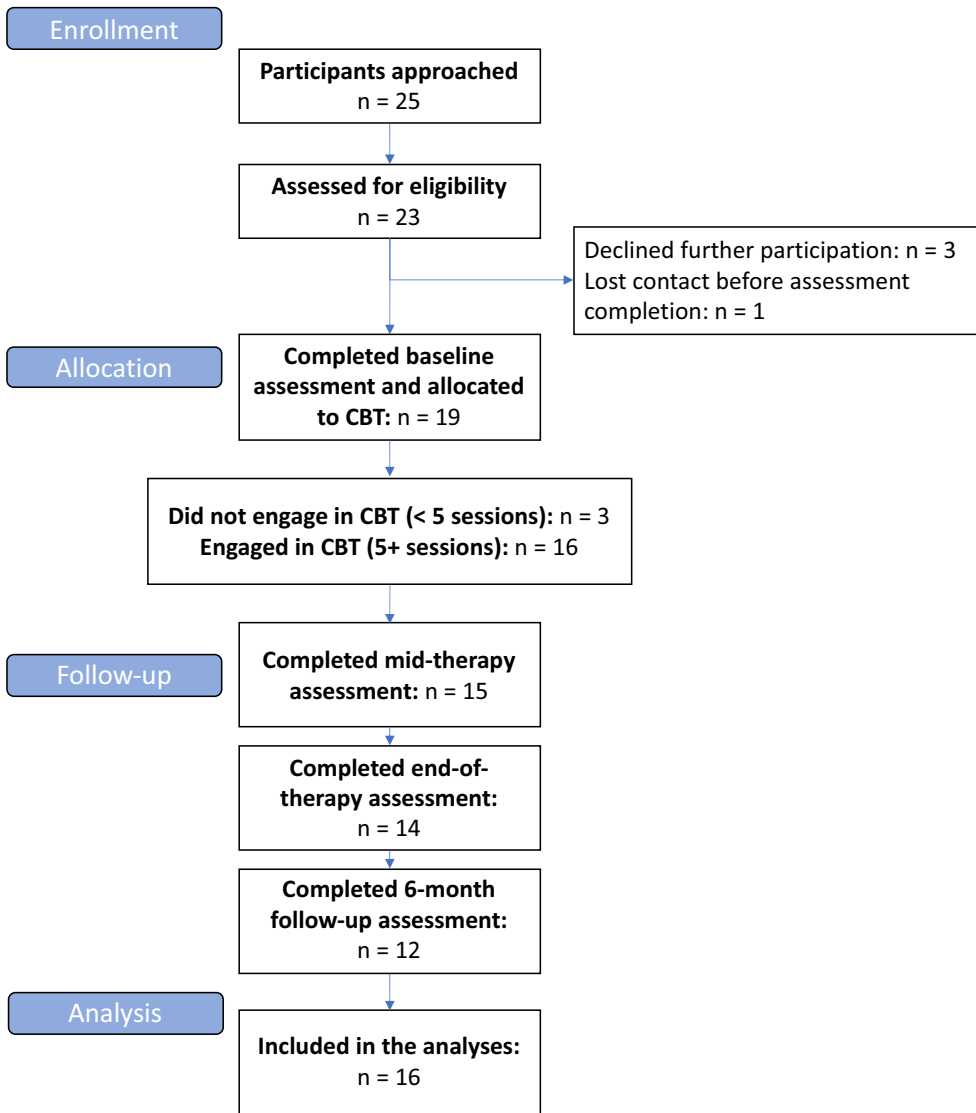
Figure 2. Flow diagram illustrating recruitment and retention of participants over the course of the study. [Colour figure can be viewed at wileyonlinelibrary.com]

estimation test found significant differences between baseline and mid-therapy scores ($p = .005$; $d_{rm} = 0.947$) as well as between baseline and end-of-treatment scores ($p < .001$; $d_{rm} = 1.195$).

As baseline PSYRATS-Del scores were negatively skewed ($z_{skewness} = -2.02$), Friedman's test was used to examine changes in delusion severity over time. The analysis found significant reductions in PSYRATS-Del scores over the course of the study; $\chi^2(2) = 18.74$, $p < .001$. Post-hoc comparisons with Wilcoxon signed-rank tests indicated that there were statistically significant improvements in delusion severity at both the mid-therapy assessment ($Z = -3.06$, $p = .002$, $d_{rm} = 1.234$) and the of end-of-treatment assessment ($Z = -2.94$, $p = .003$; $d_{rm} = 1.079$).

Table 2. Descriptive statistics (means and standard deviations; medians and interquartile range) across study assessment points

Measures	Baseline (n = 19)		Mid-Treatment (n = 15)		End of Treatment (n = 14)		Post-Treatment (n = 12)	
	M (SD)	Median (IQR)	M (SD)	Median (IQR)	M (SD)	Median (IQR)	M (SD)	Median (IQR)
DES	54.12 (13.93)	49.64 (24.64)	37.14 (14.35)	37.86 (18.75)	27.19 (14.66)	23.04 (21.61)	28.42 (21.16)	23.57 (42.68)
PSYRATS-AH	33.79 (4.25)	33.50 (7.00)	29.00 (9.16)	31.00 (9.00)	23.64 (11.04)	25.50 (15.00)	24.50 (10.67)	28.50 (15.00)
IES-R	60.17 (16.96)[a]	68.00 (45.00)	51.07 (16.46)	57.00 (38.00)	38.36 (18.09)	37.00 (30.00)	36.33 (27.80)	36.00 (29.00)
PSYRATS-Del	16.44 (7.13)[a]	17.00 (15.00)	8.67 (8.33)	5.00 (16.00)	8.86 (8.43)	7.00 (17.00)	5.83 (7.25)	0.00 (10.00)
DASS-21	42.58 (5.61)	41.00 (9.00)	28.67 (14.04)	28.00 (26.75)	25.71 (12.30)	29.00 (17.25)	25.67 (11.39)	29.00 (20.25)
QPR	17.41(11.01)[b]	13.00 (18.50)	32.53 (10.53)	30.00 (16.50)	34.38 (7.79)	35.00 (13.50)	33.83 (10.14)	30.00 (15.00)
CHOICE	26.89 (17.40)	26.00 (19.25)	46.20 (21.40)	38.50 (46.00)	54.93 (23.46)	59.50 (31.75)	55.08 (16.57)	56.50 (25.50)

Note. CHOICE = the CHoice of Outcome in Cbt for psychosEs; DASS-21 the short Depression and Anxiety Stress Scale; DES = Dissociative experiences scale, time bound; IES-R = Revised Impact of Events Scale; PSYRATS-AH = Auditory hallucination scale of the PSYRATS; PSYRATS-DEL = delusions subscale of the PSYRATS; QPR = Questionnaire about the Process of Recovery.
[a]*n* = 18.; [b]*n* = 17.

There were significant improvements in symptoms of anxiety, depression, and stress assessed through the DASS-21; $F(2, 14) = 17.687$, $p < .001$, partial $n^2 = .541$. Post-estimation tests indicated that that there were significant differences between baseline and mid-therapy DASS-21 scores ($p = .001$; $d_{rm} = 1.007$) as well as between baseline and end-of-treatment scores ($p < .001$; $d_{rm} = 1.527$).

Finally, analyses focusing on QPR scores indicated that perceived recovery significantly increased over the course of treatment; $F(2, 12) = 22.31$, $p < .001$, partial $n^2 = .632$, with statistically significant improvements observed at both mid-therapy ($p < .001$; $d_{rm} = 1.344$) and end-of-treatment assessments ($p < .001$; $d_{rm} = 1.582$) relatively to baseline scores. Comparable results were observed in our analyses of the CHOICE, which indicated significant overall improvements over the course of treatment, $F(2, 15) = 15.08$, $p < .001$, partial $n^2 = .485$, with noticeable and statistically significant gains at both mid-therapy ($p = .001$; $d_{rm} = 1.031$) and end-of-treatment follow-up assessments ($p < .001$; $d_{rm} = 1.446$).

In all cases, inspection of the 6-month follow-up scores found no evidence of deterioration in any of the secondary outcome measures above, suggesting that treatment benefits were maintained beyond the end of treatment.

Discussion

Our work purposefully and specifically targeted dissociation and voice hearing in people with psychosis with a history of trauma and adversity. The intervention examined in this case series led to a range of promising findings. First, our primary analyses found large and statistically significant improvements on measures of dissociation and auditory hallucination severity. Of note, these improvements were already noticeable at the mid-therapy follow-up assessment, and by the end-of-therapy assessment, they were large in magnitude (i.e., $d_{rm} > 0.80$; Cohen, 1988). Furthermore, treatment gains remained robust at the final follow-up assessment conducted six months after the end of therapy. Second, our secondary analyses found similarly large and statistically significant improvement on a range of other relevant outcome measures, including delusions severity, post-traumatic symptoms, symptoms of anxiety, depression and stress as well as service user-led measures of CBTp outcomes and perceived recovery from psychosis-related difficulties.

The signals of efficacy summarized above are particularly striking given the complex clinical characteristics of the participants in this study. All participants had experienced multiple traumatic events in both childhood and adulthood, including prolonged emotional maltreatment, severe physical abuse, and sexual assaults. Over half of the sample were survivors of childhood sexual abuse. At baseline, participants presented not only with distressing psychotic symptoms, but most had post-traumatic symptoms sufficiently severe to warrant a diagnosis of PTSD and levels of dissociation greater than those generally observed in previous studies with participants with psychosis (Lyssenko *et al.*, 2018). Of note, participants' baseline scores on the QPR were considerably lower than those observed in previous clinical trials with complex psychosis clients, such as patients with diagnoses of schizophrenia who do not respond to clozapine treatment (Morrison *et al.*, 2018). Hence, the sample would seem to be representative of those of clients with psychosis and complex trauma found in EI services and other secondary care mental health services. Furthermore, as the intervention considered in this case series was delivered in the context of practitioners' routine clinical practice, the findings of this case

series may generalize, pending future replication, to the treatment of clients in secondary care mental health settings. The treatment appeared to be acceptable, with only three clients (15% of the sample) dropping out early in the intervention (i.e., before completing less than five therapy sessions); this figure is comparable to those observed in previous CBTp clinical trials (Dunn *et al.*, 2012).

Our findings suggest that it is possible to achieve substantial improvements in dissociation-related outcomes in clients with psychosis during relatively brief treatment periods and are consistent with other recent clinical studies, such as ongoing investigations evaluating the use of brief treatment protocols to treat comorbid depersonalization disorder in clients with psychosis (Farrelly, Peters, Azis, David, & Hunter, 2016). The observation of substantial improvements in hallucination severity during treatment phases predominantly focused on the use of strategies to manage dissociative experiences is consistent with proposals that dissociation may represent an important factor in the maintenance of hallucinatory experiences and a valuable treatment target in psychological interventions for distressing voices (Pilton *et al.*, 2015; Berry, Bucci & Varese, 2019). It is notable, however, that the treatment gains for other secondary outcomes considered in this case series were substantial, and in several cases larger, than those observed for voices. These results are therefore consistent with the notion that dissociation is not uniquely linked to hallucinations and might be involved in the maintenance of other symptoms of psychosis, such as delusions and paranoia (e.g., Longden *et al.*, 2020; Pearce *et al.*, 2017). An implication of these findings is that the treatment of dissociation should not be regarded as relevant only in the context of clients with distressing voices as it may also benefit clients presenting with other psychotic experiences.

Other recently published case series have evaluated other trauma-focused intervention techniques, in particular imagery rescripting, that have been adapted to specifically ameliorate distressing hallucinations in people with psychosis (Brand, Bendall, Hardy, Rossell, & Thomas, 2020; Paulik, Steel, & Arntz, 2019). These case series have also uncovered promising treatment effects, comparable to those reported in our investigation. Future research and intervention development work could focus on evaluating to what extent these interventions could be integrated into a single treatment protocol that could suit the varied needs of individuals with lived experience of voices and a history of trauma. Furthermore, in the light of the multiple 'routes' from trauma to psychotic symptoms that have been highlighted in recent studies (Williams *et al.*, 2018), research could be conducted to understand whether specific trauma-focused intervention strategies may be better suited for targeting specific trauma-related mechanisms involved in the maintenance of psychotic symptoms (e.g., whether imagery rescripting might be more indicated when hallucinations are clearly trauma-related in content and linked to trauma intrusions; whether dissociation-focused work might be acceptable and beneficial only to clients with high levels of dissociative experiences).

In the present case series, the rationale for embedding dissociation-focused therapeutic work within CBTp was to improve treatment outcomes for voices in clients with histories of trauma. In line with this overarching objective, and to maximize both intervention acceptability and likelihood of benefit, our treatment protocol permitted the use of cognitive behavioural change strategies that could directly impact voices and voice-related distress (e.g., challenging maladaptive appraisals of voices). Therefore, we cannot exclude the possibility that the effects on voices observed in this case series might be attributable to these 'voice-specific' strategies rather than the additional dissociation work we aimed to evaluate. Future studies aiming to investigate the value of therapeutic work considering dissociation in clients with distressing voices may benefit from using more

specific intervention protocols which solely target dissociation. Alternatively, researchers could employ more sophisticated research designs, such as dismantling studies, to examine more specifically this component of the intervention.

Other limitations should be considered when interpreting the findings of this research. First, the lack of a control group is a significant limitation; our design cannot clarify whether the treatment gains we observed are specifically attributable to the intervention rather than to the passage of time. Compounded with the fact that the case series design we employed did not allow for the masking of outcome assessments, it is likely that the effects observed in our study are inflated. Second, we conducted multiple statistical tests on a range of outcome variables, leading to the possibility of inflated type 1 errors (i.e., false positives). We note, however, that the effects observed in our study are highly significant; most would survive the use of very conservative corrections for multiple testing, such as the application of the Bonferroni correction to the entire set of inferential tests conducted in the study (21 tests, leading to a threshold of $p = .0024$). Only three follow-up tests would not survive the application of this conservative correction. These include the follow-up comparison between baseline and mid-treatment PSYRATS-AH scores ($p = .003$), baseline and mid-treatment IES-R scores ($p = .005$), and baseline and mid-treatment PSYRATS-Del scores ($p = .003$).

Given the promising findings and acceptable attrition rates observed in this study (which are in line with those of previous definitive efficacy trials of CBTp; e.g., Morrison *et al.*, 2018), a future clinical trial using a randomized controlled design is warranted and needed to evaluate more robustly the approach piloted in this case series. Future studies may also employ more comprehensive and sensitive assessments of the primary and secondary outcomes considered in this investigation. For example, the assessment of dissociation could benefit from the use of recently developed and carefully validated state measures of dissociative symptoms, such as the Dissociative Symptoms Scale (Carlson *et al.*, 2018). Furthermore, as dissociation may be involved in the maintenance of psychotic experiences other than voices, future trials could benefit from assessing hallucinations in other sensory modalities (e.g., Dudley, Aynsworth, Cheetham, McCarthy-Jones, & Collerton., 2018; Longden, House, & Waterman, 2016) as well as other positive symptoms of psychosis such as paranoia (e.g., Pearce *et al.*, 2017).

In summary, the findings of this case series suggest that dissociation is a valuable target in psychological interventions for psychosis, but further research is required to corroborate these early findings. Our results can inform future clinical trials of both this specific treatment approach and broader interventionist-causal trials aimed at improving treatment outcomes for distressing psychotic experiences reported by trauma survivors (e.g., Brand *et al.*, 2017). The findings of this case series suggest that when voices are reported during clinical assessments, it is advisable to routinely enquire about the experience of dissociation and trauma. When relevant, clinicians should include information about dissociative experiences and traumatic life events in psychological formulation developed collaboratively with clients and offer interventions that include strategies aimed at improving the management of dissociation.

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Conflicts of interest

All authors declare no conflict of interest.

Author contribution

Filippo Varese, PhD, ClinPsyD (Conceptualization; Formal analysis; Investigation; Methodology; Project administration; Supervision; Writing – original draft) Maggie Douglas (Investigation; Resources; Writing – review & editing) Robert Dudley (Conceptualization; Data curation; Formal analysis; Investigation; Project administration; Supervision; Writing – original draft) Samantha Bowe (Conceptualization; Writing – review & editing) Thomas Christodoulides (Investigation) Stephanie Common (Investigation) Tim Grace (Investigation) Victoria Lumley (Investigation) Laura McCartney (Investigation) Sonia Pace (Investigation) Thomas Reeves (Investigation) Anthony P. Morrison (Conceptualization; Resources; Supervision; Writing – review & editing) Douglas Turkington (Investigation; Project administration; Supervision; Writing – review & editing)

Data availability statement

The data that support the findings of this study are available on request from the corresponding author, FV.

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Supporting Information

The following supporting information may be found in the online edition of the article:

Table S1. Descriptive statistics (means and standard deviations; medians and interquartile range) for the last observation carried forwards analyses ($n = 16$)