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Does schema therapy change schemas and symptoms? A systematic review across mental health disorders

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Purpose. Schema therapy was first applied to individuals with borderline personality disorder (BPD) over 20 years ago, and more recent work has suggested efficacy across a range of disorders. The present review aimed to systematically synthesize evidence for the efficacy and effectiveness of schema therapy in reducing early maladaptive schema (EMS) and improving symptoms as applied to a range of mental health disorders in adults including BPD, other personality disorders, eating disorders, anxiety disorders, and post-traumatic stress disorder.

Methods. Studies were identified through electronic searches (EMBASE, PsycINFO, MEDLINE from 1990 to January 2016).

Results. The search produced 835 titles, of which 12 studies were found to meet inclusion criteria. A significant number of studies of schema therapy treatment were excluded as they failed to include a measure of schema change. The Clinical Trial Assessment Measure was used to rate the methodological quality of studies. Schema change and disorder-specific symptom change was found in 11 of the 12 studies.

Conclusions. Schema therapy has demonstrated initial significant results in terms of reducing EMS and improving symptoms for personality disorders, but formal mediation analytical studies are lacking and rigorous evidence for other mental health disorders is currently sparse.

Practitioner points

- First review to investigate whether schema therapy leads to reduced maladaptive schemas and symptoms across mental health disorders.

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- Limited evidence for schema change with schema therapy in borderline personality disorder (BPD), with only three studies conducting correlational analyses.
- Evidence for schema and symptom change in other mental health disorders is sparse, and so use of schema therapy for disorders other than BPD should be based on service user/patient preference and clinical expertise and/or that the theoretical underpinnings of schema therapy justify the use of it therapeutically.
- Further work is needed to develop the evidence base for schema therapy for other disorders.

Schema therapy is a psychological treatment which has had increasing popularity over the last 10 years (van Vreeswijk, Broersen, & Nadort, 2012). It is an integrative psychological therapy, which developed from a cognitive behavioural tradition, but draws heavily on interpersonal, psychodynamic, and experiential techniques. Young (1990) first described schema therapy to help treat pervasive, long-term psychological difficulties unresponsive to traditional cognitive therapy, such as personality disorders. Interest in applying schema therapy to other disorders has increased over recent years, with studies examining early maladaptive schemas (EMS) in other severe mental health conditions (e.g., psychosis; Bortolon, Capdevielle, Boulenger, Gely-Nargeot, & Raffard, 2013; Taylor & Harper, 2016). Case study and treatment chapters have included substance use (Ball & Young, 2000), eating disorders (Waller, Kennerley, & Ohanian, 2007), post-traumatic stress disorder (Gray, Maguen, & Litz, 2007), and obsessive compulsive disorder (Sookman & Pinard, 1999, 2007). Schema therapy is focused on how symptoms and difficulties have developed, and how they may be contributing as present maintaining factors. It aims to identify core emotional needs and help the individual find functional ways of having their needs met (Rafaeli, Bernstein, & Young, 2011). It has been delivered in both individual (Giesen-Bloo *et al.*, 2006; Nadort *et al.*, 2009) and group formats (Farrell, Shaw, & Webber, 2009). Although several studies have investigated schema therapy, and there have been reviews looking at whether schema therapy leads to symptom change, it is unclear whether schema therapy leads to change in the EMS/modes themselves as the mechanism for change. The present review aimed to address this by considering both EMS/modes change and symptom change for the first time.

A central concept in schema therapy is the EMS. This is a cognitive structure defined as negative beliefs regarding oneself, others, and the world, which is long-standing, and gives meaning to experiences (Young, 1990). Maladaptive schemas can be seen as consisting of cognitions, emotions, memories, and bodily sensations combined to form maladaptive schema. They are believed to develop in childhood and adolescence and be built upon in adulthood (Young, Klosko, & Weishaar, 2003). Eighteen EMS have been outlined and are believed to fall under five key domains: disconnection and rejection, impaired autonomy performance, undesirability, restricted self-expression, and impaired limits (Schmidt, Joiner, Young, & Telch, 1995).

A further element of the model is the schema mode approach. The schema modes were described to explain the changes in behaviour that individuals with borderline personality disorder (BPD) such as moving quickly between emotional states. The mode concept suggests that individuals experience these strong emotional shifts because an environmental cue triggers a regression into an intense emotional experience first encountered in childhood. At such times, a schema mode, 'an organized pattern of thinking, feeling, and behaving based on a set of schema relatively independent from other schema modes' (Arntz & van Genderen, 2009) is activated. It has been proposed, when an EMS is triggered, the individual's coping mechanism results in related schema mode activation. Therapy techniques focus on helping strengthen the 'healthy adult' and 'happy child'

modes. Thus, schema therapy can consist of therapeutic approaches which work with EMS (trait like concepts) and/or schema modes (state like, but also enduring concepts). The frequency of shifts of schema modes is important at the individual level, but is not what defines a schema mode. Modes have been described as either shifting frequently for a particular individual or remain relatively constant. Significant difficulties can arise for patients who experience either extreme (Young *et al.*, 2003).

However, despite the rising popularity among clinicians for the approach, only a small number of studies have tested schema therapy but those which have found promising results. A randomized trial comparing schema therapy versus transference-focused psychodynamic therapy in individuals with BPD ($N = 86$) demonstrated a significant symptom reduction (Giesen-Bloo *et al.*, 2006) and a more recent randomized controlled trial comparing schema therapy with clarification-oriented therapy (a form of client centred therapy developed for personality disorders) and treatment as usual for cluster C anxious, paranoid, histrionic, or narcissistic personality disorder ($N = 323$) demonstrated a significant greater proportion of patients recovered in the schema therapy group with 81% recovered in ST versus 61% recovered in clarification-oriented therapy versus 51% in treatment as usual (Bamelis, Evers, Spinhoven, & Arntz, 2014).

As interest in schema therapy has grown, there have been a few systematic reviews and meta-analyses published examining symptom reduction evidence (Jacob & Arntz, 2013; Sempértegui, Karreman, Arntz, & Bekker, 2013). These reviews have focused exclusively on schema therapy for BPD, and none have focused on whether schema therapy reduces EMS or dysfunctional schema modes. This issue is of key importance, as the model of schema therapy suggests that change in symptoms should be the outworking of change to maladaptive schemas. Numerous models of psychological therapy are based on clinical heuristics (Tarrier, 2007) which aid the development of individualized psychological formulations (Persons, 2012; Tarrier & Johnson, 2015). Schema therapy's focus is on EMS and schema modes, and their role in the maintenance of symptoms and distress. Thus, one would anticipate that a therapy which suggests schemas maintains distress in the assessment and formulation phases and would then target and change schemas in the intervention phase. Such change would be demonstrated in treatment studies and thus included in a systematic review such as this one. If symptoms reduce, while schema remains unchanged, this might indicate changes for how schema therapy is practised, providing new clinical guidance in terms of a focus on symptom reduction or schema reduction. Furthermore, if there are recurring design issues in the trials retrieved, then these will inform future studies.

To our knowledge, this is the first review which has examined the extent to which schema therapy changes schemas and symptoms across mental health disorders. The aim of this study was to systematically review the evidence for the efficacy and effectiveness of schema therapy for changing schemas and symptoms across disorders.

Methods

Studies evaluating schema therapy interventions were reviewed. To be included, studies needed to examine a schema intervention in a mental health disorder and use a validated schema questionnaire or inventory as a measure. Detailed inclusion criteria are listed below.

Searches

A search of electronic databases was conducted of EMBASE, PsycINFO, and MEDLINE. The search time frame was from 1990 to January 2016, the time frame over which schema therapy was first described. The references of eligible studies and the references of the most recent reviews of schema therapy for BPD (Jacob & Arntz, 2013; Sempértegui *et al.*, 2013) and a previous schema therapy review (Masley, Gillanders, Simpson, & Taylor, 2012) were also checked.

Inclusion criteria were as follows:

1. Single-blind randomized controlled trials (RCTs), open trials (without control groups), and, because of limited evidence base, case series.
2. Studies where schema therapy was the intervention or a component of the intervention being examined (no minimum number of sessions specified).
3. Studies where a schema questionnaire (EMS, mode) was used as a measure.
4. Studies where a specific Axis I and Axis II mental health disorder were included.
5. A measure of symptoms and symptom change was included in the study.

Exclusion criteria: studies were excluded if they were as follows:

1. Individual case studies.
2. Studies only using self-help schema therapy books (without therapist sessions).

We searched titles/abstracts for ('mental health', OR 'personality disorder', OR 'schizophrenia', 'psychosis' OR obsessive compulsive disorder, OR anxiety, OR depression, OR substance abuse, OR eating disorders, OR panic, OR agoraphobia, OR health anxiety OR social phobia OR hypochondriasis, OR post-traumatic stress disorder, OR trauma) AND (schema OR EMS OR schema mode OR Young's model OR mode).

Review and outcomes

Primary outcome was a change in EMS or schema modes as defined with each schema measure. Secondary outcomes were outcomes on symptoms/behaviour, depending on the study.

Assessment of studies

Methodological rigour was assessed using the Clinical Trial Assessment Measure (CTAM; Tarrier & Wykes, 2004). The CTAM is a dedicated scale for assessing the quality of psychological treatment trials in mental health. Previous trial quality measures are overly focused on medical or pharmacological trials and did not sufficiently cover psychological treatment trial design issues. It was developed with reference to the Consolidated Standards of Reporting Trial guidelines (Moher, Schulz, Altman & CONSORT Group, 2001) and a review of 25 trial assessment measures (Moher *et al.*, 1995). The CTAM offers an overall assessment of the methodological rigour on six subscales, assessing sample size, recruitment method, allocation to treatment, assessment of outcome, control groups, description of treatment, and analysis. The CTAM total score gives an overall quality indication. It has been used to assess numerous trials of cognitive behaviour therapy (CBT) including psychosis (Lobban *et al.*, 2013; Tarrier & Wykes, 2004; Wykes, Huddy, Cellard, McGurk, & Czobor, 2011; Wykes, Steel, Everitt, & Tarrier, 2008). A total CTAM score of 65 or above was chosen by Wykes *et al.* (2008) to describe adequate methodology. In developing the CTAM, Wykes *et al.* (2008) identified 65/100 as an arbitrary but valid,

cut-off, stating 'because there was no specific domain that was poor in all the studies, a cut-off score for the CTAM total of 65 was taken to indicate adequate methodology'.

Results

Study selection

The study selection is outlined in Figure 1.

An initial search resulted in 1,555 results, with an additional eight records identified from reference checking of key articles. Seven hundred and twenty-eight duplicate records were removed, leaving 835 records. Of these, 792 were excluded on the basis of
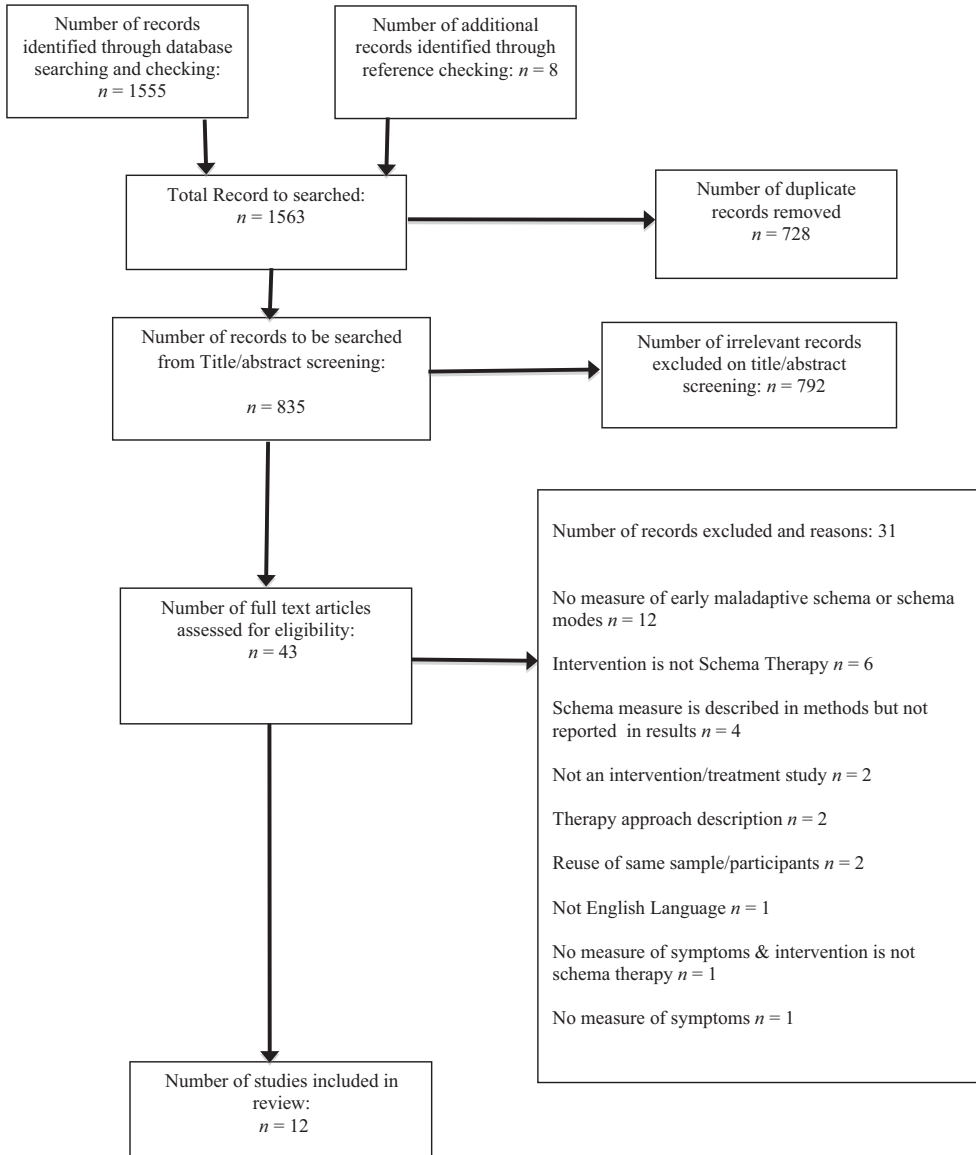

Figure 1. PRISMA flow diagram detailing article selection.

the information in the title and abstract. Forty-three full-text articles were read. Of these, 31 were excluded (see Appendix S1 for details on specific studies and exclusion reasons). Of these excluded studies, 12 did use a schema therapy intervention; however, they did not utilize a schema measure, and thus, these are not included. Only one study was excluded primarily on the basis of language. This resulted in a total of 12 studies which were eligible for inclusion which are outlined in Table 1.

Study characteristics and schema therapy treatment

The largest number of studies of schema therapy measuring schema change to date has been conducted in the treatment of BPD ($n = 7$), followed by eating disorders ($n = 2$), agoraphobia and personality disorders ($n = 1$), post-traumatic stress disorder in veterans ($n = 1$), and depression ($n = 1$). From the 12 studies identified, there were a total of 316 participants. The number of participants ranged from 6 to 62 (Mean 26.3; *SD* 19.8). Five studies were conducted in the Netherlands (Dickhaut & Arntz, 2014; Nadort *et al.*, 2009; Renner *et al.*, 2013; van Vreeswijk *et al.*, 2014; Videler, Rossi, Schoevaars, Van der Feltz-Cornelis, & Van Alphen, 2014), two in Norway (Hoffart, Versland, & Sexton, 2002; Nordahl & Nysæter, 2005), three in Australia (Cockram, Drummond, & Lee, 2010; George, Thornton, Touyz, Waller, & Beumont, 2004; Skewes, Samson, Simpson, & van Vreeswijk, 2015), one in Scotland (Simpson, Morrow, Vreeswijk, & Reid, 2010), and one in Greece (Malogiannis *et al.*, 2014). Interventions were either individual schema therapy ($n = 5$), group schema therapy ($n = 5$), or a combination ($n = 2$). Ten studies were conducted with outpatients, one with inpatients (Hoffart *et al.*, 2002) and one with participants who were initially inpatients and then outpatients (Cockram *et al.*, 2010). Generally, the studies were of low-quality design with three case series, eight open trials, and one randomized trial.

Schema therapy treatment

Schema therapy delivered in the studies was based on the treatment approaches of a number of authors. The original manual and subsequent versions were described by Young (1990, 1996, 1999) and Young *et al.* (2003) with the original focus on the identification and treatment of EMS and then later schema modes. Arntz and van Genderen's (2009) manual expanded the individual therapy schema mode approach specifically for BPD. Van Vreeswijk and Broersen's (2006, 2013) manual is a schema-focused group protocol with schema-focused CBT strategies, targeting schemas and schema modes. Finally, the Farrell and Shaw's (2012) group schema therapy approach has four components including emotional awareness training, BPD psychoeducation, distress management training, and schema change work. The intervention timescales also varied from 1 to 2 hr sessions weekly for 20 weeks to up to 60 sessions of individual therapy (see Table 1). Session number described in some studies was unclear. For example, this could range from an estimated 50–150 sessions (Nordahl & Nysæter, 2005) or sessions over 8 months (Dickhaut & Arntz, 2014) or longer. Where possible, sessions have been reported or estimated in Table 1.

Schema measures

Each included study used a version of the Young Schema Questionnaire (YSQ) in either the long form (Young & Brown, 1990; 1994), the short form (Young, 1998) or the Dutch version (Rijkeboer, van den Bergh, & van den Bout, 2005). Other schema measures

Table 1. Studies measuring schema change and symptom change and utilizing a schema therapy intervention approach

Authors	Clinical group	*n*	Mean age (SD)	Number women	Type of schema intervention	Design
Nordahl and Nysæter (2005)	BPD	Six participants with BPD	19–42	6	ST Young (1996) protocol with schema mode work	Single case series A–B design
Nadort *et al.* (2009)	BPD	62 BPD participants	ST + phone 31.81 (9.24) ST − phone 32.13 (9.01)	ST +phone (31) ST − phone (29)	ST Arntz and van Genderen (2009)	Randomized two-group design
van Vreeswijk *et al.* (2014)	Psychiatric outpatients: Axis I (mixed diagnosis)	63 at intake. 48 who completed	39.35 (8.05)	32	Group ST van Vreeswijk and Broersen (2006)	Naturalistic design – pre- and post - measures
Renner *et al.* (2013)	PD. DSM-IV Cluster B or Cluster C or mixed diagnosis group	26	22.5	17	Group ST; van Vreeswijk and Broersen (2006)	Open trial
Dickhaut and Arntz (2014)	Borderline personality disorder	18 (Group 1 = 8; Group 2 = 10)	25.8 (8.7)	18	Group ST and individual sessions; Arntz and van Genderen (2009) and Farrell and Shaw (2012)	Case series

Comparison condition	Number of intervention session	Schema measure	Other measures	Follow-Up (months)	Results	CTAM score
N/A	N not specified. Estimate 50–150 sessions	YSQ 2 1991, with four EMS subscales selected	SCID-I; SCID-II; BAI; BDI; IIP; SCL-90; GAF	20th, 40th session, post-treatment (65–120) sessions 12-month follow-up	Schema scores decreased with large ES of 1.8. Large ES symptom improvements for five participants – range = 1.8–2.9	19
ST Minus phone support	50 in 1st year (twice weekly), then once a week in Year 2	YSQ Dutch Version 2005	BPDSI-IV; EuroQol; WHOQOL; BPD-47; SCL-90	At 18 months	Significant reduction in schema scores in both groups $d = 0.69$. BPDSI indicated reduction in symptoms with ES = 1.55	81
N/A	20 sessions	YSQ; YAMI	SCL-90 (GSI)	N/A	EMS schema and schema modes significant reduction with medium-to-large ES (0.75 for schemas and 0.63 for maladaptive schema modes). Significant reduction in symptoms with SCL-90 GSI pre-treatment to end of treatment effect size = 0.66	19
N/A	20 sessions: 18 sessions plus two boosters	YSQ-SF Dutch Version (2008); SMI; SCQ	SCID-I; SCID-II; SCL-90	N/A	Schemas decreased with medium-to-large ES (0.88–0.98) Global distress from symptoms decreased significantly with ($d = 0.81$)	19
N/A	Group 1: 90-min group sessions combined with weekly 1-hr individual sessions. Group 2: 30 weekly sessions plus individual sessions over 8 months	YSQ Dutch Version 2005; SMI Dutch Version	BPDSI-IV; BPD checklist; SCL-90; WHOQOL; EuroQoL	6 month	SMI: Dysfunctional schema mode reduction in both groups ($d = 1.16$). Functional modes improved ($d = 1.48$). YSQ – schema scores decreased ($d = 1.64$). Significant reduction in BPDSI symptoms at follow-up ($d = 2.72$)	16

Continued

Table 1. *(Continued)*

Authors	Clinical group	*n*	Mean age (SD)	Number women	Type of schema intervention	Design
Videler *et al.* (2014)	Older adults with personality disorder features and/or mood disorders	31 treatment completers	68 (4.6)	22	Group ST (Broersen and Van Vreeswijk, 2012)	Open trial
Skewes *et al.* (2015)	Mixed personality disorders, predominant diagnosis avoidant personality disorder	8	33.8	Sex of participants not reported	Group ST (van Vreeswijk and Broersen, 2013)	Open trial
Other conditions						
George *et al.* (2004)	Anorexia nervosa	8	36	8	MI and Schema-focused CBT; Young (1994)	Open trial
Simpson *et al.* (2010)	Eating disorders and Axis I and Axis II conditions	8	32.6 (3.9)	8	Group schema therapy; van Vreeswijk and Broersen (2006)	Open trial
Hoffart *et al.* (2002)	Panic or agoraphobia and personality disorders (and/or personality traits)	35	40.1 (9.5)	28	6 week ST PD focused phase on EMS and agoraphobia intervention; Young (1990)	Open trial
Cockram *et al.* (2010)	War Veterans with PTSD	54	52 (11.1)	2	ST within a war related PTSD group Young (1999)	Open trial

Comparison condition	Number of intervention session	Schema measure	Other measures	Follow-Up (months)	Results	CTAM score
N/A	20 sessions: 18 sessions plus two boosters	YSQ-L-2 (Young & Brown, 1994; Dutch translation Sterk & Rijkeboer, 1997); SMI (Dutch Version Lobbestael, van Vreeswijk, Arntz, Spinhoven & 't Hoen, 2005)	BSI (De Beurs, 2011)	N/A	YSQ: schema scores decreased ($d = 0.54$). SMI: Parent modes decreased $d = 0.35$); child modes decreased ($d = 0.26$); and healthy modes increased ($d = -0.34$). BSI symptomatic distress improved ($d = 0.54$)	19
N/A	18 sessions plus two boosters plus five individual sessions	YSQ-SQ (Young, 1998); SMI (Young et al., 2007); Lobbestael et al. (2010)	MCMI-III: SCL-90	6 month	YSQ: schema scores decreased (pre- to post- $d = 2.20$; SMI maladaptive schema decreased ($d = 1.69$); SMI adaptive increased ($d = 1.32$); GSI from SCL-90 improved ($d = 1.06$)	34
N/A	2 days a week, two 1 hr groups, and one 90-min group for 6 months	YSQ (1st Edition)	ANSOCQ; ESLS; GHQ-28	6 month	No changes on YSQ. Slight increase in BMI ($d = 0.25$)	19
N/A	20 group sessions	YSQ-L2	EDE-Q; HADS; EQ5-D; ESS	6 month	YSQ schema scores were reduced ($d = 1.76$). ED symptom severity reduced ($d = 1.8$)	19
N/A	11 week in patient programme	YSQ-LF	MI-AAL; MI-ACC; BSQ; ACQ; PRS; STAI; BDI; SCID-I; SCID-II; ACI	1 year	Reduction in early maladaptive schemas ($d = 0.6$). No schema modes measured. MI-AAL ($d = 0.68$ PD-Cluster C Index ($d = 0.39$) MI-ACC reduction ($d = 0.47$)	24
N/A	190 hr of contact time ST or TCBT 6 session on SFT	YSQ-L3	PCL-M; HADS;	3 month	Significant reduction in 17 EMS scores from intake to follow-up in SFT grp (Mean $d = 33$) PTSD reduced in schema group ($d = 0.81$) versus comparison group ($d = 0.59$)	16

Continued

Table 1. *(Continued)*

Authors	Clinical group	*n*	Mean age (*SD*)	Number women	Type of schema intervention	Design
Malogiannis *et al.* (2014)	DSM-IV chronic Depression and 15 or above on HRSD	12	42.6	12	Schema Therapy Mode approach – Arntz (2012)	Case series

Note. BPD = Borderline Personality Disorder; YSQ 2 = Young Schema Questionnaire (Young & Brown, 1994); SCID-I = Structured Clinical Interview for DSM-IV Disorders I (Spitzer, Gibbon, & Williams, 1997); SCID-I = Structured Clinical Interview for DSM-IV Disorders (Gibbon, Spitzer, & First, 1997);BAI = Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988); BDI = Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961); IIP = Inventory of Interpersonal Problems (Horowitz, Rosenberg, Baer, Ureño, & Villaseñor, 1988); SCL-90 = Symptom Checklist-90 Revised (Derogatis, 1992); GAF = General Adaptive Functioning Scale DSM-IV (American Psychiatric Association, 2000); ST = Schema Therapy; YSQ Dutch Version 2005 = Young Schema Questionnaire (Rijkeboer *et al.*, 2005); BPDSI-IV = Borderline Personality Disorder Severity Index (Arntz *et al.*, 2003); EuroQoL = Health-Related Quality of Life Measure (EuroQol, 1990); WHOQO-L = World Health Organization Quality of Life (Harper, 1998); BPD-47 = BPD Checklist (Giesen-Bloo *et al.*, 2006); YSQ-SF = Young Schema Questionnaire (Young & Brown, 1994; Young & Pijnakker, 1999); YAMI = Young–Atkinson Mode Inventory (Young & Atkinson, 2003); YSQ-SF Dutch Version (2008) = Young Schema Questionnaire Short Form Dutch Version 2008 (Rijkeboer, 2008); SMI = Schema Mode Inventory (Young *et al.*, 2007); SCQ = Schema Coping Questionnaire (van Vreeswijk & Broersen, 2006); SMI Dutch Version = (Lobbestael, van Vreeswijk, Spinhoven, Schouten, & Arntz, 2010); YSQ (1st Edition) = Young Schema Questionnaire First Edition (Young & Brown, 1994); Millon Clinical Multiaxial Inventory (MCMI-III; Millon, Davis, & Millon, 1997); ANSOCQ = Anorexia Nervosa Stages of Change Questionnaire; (Rieger, Touyz & Beumont, 2002); ESLS = Extended Satisfaction with Life Scale (Allison, Alfonso, & Dunn, 1991); GHQ-28 = General Health Questionnaire (Goldberg, 1972); BMI = Body Mass Index; YSQ-L2 = Young Schema Questionnaire Long Version (2nd Edition; Young & Brown, 1990); EDE-Q = Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994); HADS = Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983); EQ5-D = Health-Related Quality of Life Measure (EuroQol, 1990); ESS = Experience of Shame Scale (Andrews, Qian, & Valentine, 2002); YSQ-LF = Young Schema Questionnaire Long Form (Schmidt *et al.*, 1995); MI-AAL = Mobility Inventory for Agoraphobia Alone Version (Chambless, Caputo, Jasin, Gracely, & Williams, 1985); MI-ACC = Mobility Inventory for Agoraphobia Accompanied (Chambless, *et al.*, 1985); BSQ = Body Senzation Questionnaire (Chambless, Caputo, Bright, & Gallagher, 1984); ACQ = Agoraphobic Cognitions Questionnaire (Chambless, *et al.*, 1984); PRS = Panic Rating Scale (Clark *et al.*, 1994); STAI = State-Trait Anxiety Inventory (Spielberger, 1983); YSQ-L3 = Young Schema Questionnaire Long Form Version 3 (Young & Brown, 2003); PCL-M = PTSD Checklist Military (Forbes *et al.*, 2001); TCBT = Traditional Cognitive Behavioural Therapy; HRSD = Hamilton Rating Scale for Depression (Hamilton, 1967).

Comparison condition	Number of intervention session	Schema measure	Other measures	Follow-Up (months)	Results	CTAM score
N/A	Up to 60 sessions	YSQ, L3	SCID-I; SCID-II; HRSD	6 month	Modest and non-significant YSQ change from baseline to 24 sessions. However, large and significant YSQ change from baseline to follow-up ($d = 1.1$). Mean depression HRSD score reduced ($d = 2.2$)	31

utilized included the Young–Atkinson Mode Inventory (Young & Atkinson, 2003) and the Schema Mode Inventory (SMI; Young *et al.*, 2007). For a detailed review of the validation of the schema questionnaire and Schema Mode Inventory, see Rijkeboer (2012) and Lobbestael (2012). There were numerous additional measures of symptoms used across the studies, and these are reported in Table 1.

Schema change and symptom change outcomes

In relation to schema change, 11 of the 12 studies reported a reduction in EMS as a result of a schema therapy intervention across disorders. The study which did not demonstrate schema change was a group intervention for eating disorders with a small number of participants (George *et al.*, 2004). The remaining eleven studies did report a significant reduction in symptoms.

Personality disorder studies

Seven studies examined how effective schema therapy was in reducing EMS and in reducing symptoms of personality disorder (PD). Of these, two were case series studies (Dickhaut & Arntz, 2014; Nordahl & Nysæter, 2005), four were open trials (Renner *et al.*, 2013; Skewes *et al.*, 2015; van Vreeswijk *et al.*, 2014; Videler *et al.*, 2014), and one was an implementation-randomized trial (Nadort *et al.*, 2009). Four of the studies recruited individuals with BPDs, and three of the studies recruited those with other personality disorders, for example Cluster B or Cluster C PD or with PD features (Renner *et al.*, 2013; Skewes *et al.*, 2015; van Vreeswijk *et al.*, 2012). Of the seven PD studies, all reported significant reductions in PD symptoms. The studies which reported schema reduction also found symptom improvement. However, the majority of the PD studies scored poorly on the CTAM, and so the results should be interpreted cautiously.

In regard to schema change, all seven PD studies demonstrated a reduction in schemas at therapy end or follow-up. Nordahl and Nysæter's (2005) case series study received a CTAM rating of 19/100 and so is defined as low-quality evidence, with a small sample size, lack of a comparison group, and no randomization, and does not report rater blinding which could inflate the effect size. However, the study did report large changes in schema and symptoms. There were reductions from pre-treatment to follow-up scores on four measured maladaptive schemas for the six participants with a large effect size (1.8).

Schema modes, both maladaptive and healthy, were not measured. Symptom changes pre-treatment to follow-up had large effect sizes from 1.8 to 2.9. The Nadort *et al.*'s study (2009) found significant reductions across the whole group ($N = 62$) for maladaptive schemas from baseline to 1.5-year end of treatment with an effect size of 0.69 using the YSQ. This study was well designed, scoring 81 on the CTAM, indicating adequate methodology. The reduction in symptoms measured by the Borderline Personality Disorder Severity Index had an effect size of 1.55.

van Vreeswijk *et al.* (2014) examined group schema therapy for a mixed group of personality disorder outpatients ($N = 63$ at baseline, $n = 48$ completed). This study evaluated a naturalistic outpatient clinic, without a follow-up, and lacked a comparison group, randomization, and independent blind rater assessments. The CTAM score was 19/100. Overall, YSQ maladaptive schema scores that change from pre-treatment to end of treatment had a medium-to-large effect size of 0.75. Maladaptive schema modes were also measured in this study using the SMI and demonstrated a pre-treatment to end of treatment effect size of 0.63. There were improvements in healthy mode scores as measured by the SMI with effect sizes of −0.58 (as this is a positive schema mode, it increased from pre-treatment to end of treatment, resulting in the negative effect size reported). Symptom change as measured by the Symptom Checklist-90 (SCL-90; Derogatis, 1992) Global Severity Index demonstrated a pre-treatment to end of treatment reduction with a medium effect size of 0.66.

Renner *et al.* (2013) also examined group schema therapy for a mixed group of personality disorder outpatients ($N = 26$). The CTAM score was also 19/100, suggesting low-quality trial design, examining pre- and post-intervention scores. Maladaptive schemas measured on the YSQ short form and maladaptive schema modes on the SMI decreased with medium-to-large effect sizes (0.88 and 0.98). Global symptomatic distress measured on the Symptom Checklist-90 (SCL-90) decreased significantly (0.81).

Dickhaut and Arntz (2014) piloted schema therapy for BPD in both combined individual and group format. There were two cohorts ($n = 8$; $n = 10$) whose results were combined. The study was a pilot and so did not use randomization or additional comparison groups, and the sample size within each cohort was small. The trial design quality CTAM score was 16/100. The YSQ measured maladaptive schema scores which were reduced from baseline to final assessment at month 30, with a large effect size of 1.64. The dysfunctional schema mode scores measured by the SMI demonstrated a reduction with an effect size of 1.16. Functional, healthy modes also measured by the SMI improved with a large effect size of 1.48. The Borderline Personality Disorder Severity Index demonstrated a reduction with a very large effect size of 2.72 from baseline to last observation at 2.5-year follow-up.

Videler *et al.* (2014) conducted a proof of concept study applying group schema therapy to older outpatients with personality disorder features and mood disorders. Thirty-one participants completed. The study scored 19/100 on the CTAM measure. The YSQ total demonstrated a significant pre-therapy to end-of-therapy reduction in EMS, with a medium effect size of 0.38. Maladaptive schema modes, measured on the SMI, demonstrated reductions in parent modes, with an effect size of 0.35, and child modes, with an effect size of 0.26. There were improvements in healthy adult modes, with effect size of −0.34 (a positive schema mode that has increased from pre-treatment to end of treatment results in the negative effect size reported). General symptomatic distress, as measured by the Brief Symptom Inventory (BSI; Beurs, 2011) also demonstrated positive improvement, with an effect size of 0.54.

Skewes *et al.* (2015) examined the feasibility and acceptability of group schema therapy with a mixed personality disorder group, mainly consisting of avoidant personality disorder participants. Eight patients participated, with two dropping out early. The study scored 34/100 on the CTAM, strengthened by independent assessment of participants but weakened by a lack of randomized comparison group and small sample size. At end of therapy, four participants no longer met criteria for personality disorder, increasing to five by follow-up. There were significant reductions in EMS, reducing from baseline to end of therapy with an effect size of $d = 2.20$, and with maladaptive schema modes also reducing ($d = 1.32$). The healthy adult mode strengthened during treatment ($d = 1.06$) and clinically significant change on the GSI of the SCL-90 (Derogatis, 1992) also improved at follow-up ($d = 1.06$).

Eating disorders

Two studies were retrieved which examined schema change in schema therapy interventions for eating disorders. Both studies were group interventions with open trial designs. George *et al.* (2004) conducted a group intervention of motivational enhancement and schema-focused CBT for eight individuals with chronic anorexia nervosa. The study scored 19/100 on the CTAM measure as a result of being a naturalistic evaluation, with no comparison or control group, lack of randomization, independent rater assessments, and a small sample size. In terms of schema change outcomes, at 6 months (end of intervention), there were no changes on the subscales of the YSQ. Schema modes were not measured or reported. In terms of symptom changes, the authors found a small improvement in one key eating disorder outcome (body mass index $d = -0.25$), but little change on the General Health Questionnaire and the Eating Attitudes Test measures.

In a second study, Simpson *et al.* (2010) examined group schema therapy in eight participants with chronic eating disorders (four with bulimia nervosa or eating disorder not otherwise specified and four with anorexia nervosa). The CTAM score was also low at 19/100, due to a small sample size, absent randomized comparison group, and lack of independent raters assessments. Schema severity was reduced when comparing pre- and post-therapy scores with an effect size of 1.76 for maladaptive schema scores measured for one of the first versions of the YSQ, the Young Schema Inventory. They found clinically significant improvements in the reduction of scores on the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) in four of six completers with a pre-treatment to follow-up effect size $d = 1.8$, in addition to a reduction in schema severity. These studies provide mixed, low-quality evidence for schema change and reduction in symptoms in group schema therapy for anorexia nervosa.

Agoraphobia with personality disorder

One study has examined schema change with ST in co-occurring agoraphobia and personality traits and disorder (Hoffart *et al.*, 2002). There were 35 participants in the study (although not all met criteria for Cluster C PD). CTAM assessment demonstrated a lack of control group and independent randomization, and a lack of blinding gave a low score of 24/100. However, the study did give a description of treatment and review therapy sessions for adherence. Significant changes were found during the schema-focused phase in reducing panic/agoraphobia symptoms. There were significant improvements in panic/agoraphobia symptoms comparing assessment to follow-up on the Mobility Inventory for Agoraphobia Alone version (MI-AAL; Chambless *et al.* 1985)

$d = 0.68$ and the accompanied version (MI-ACC; Chambless, *et al.*, 1985) $d = 0.47$ with small-to-medium effect sizes. The PD-Cluster C Index also demonstrated reductions in symptoms which met criteria for Cluster C PD (SCID-II; First, Spitzer, Gibbon, Williams & Benjamin, 1994) with a small effect size $d = 0.39$.

There were also reductions in schema ratings on the schema questionnaire with a medium effect size ($d = 0.6$). This study is the first to examine schema reduction and symptom reduction with a group format approach for agoraphobia for individuals with personality disorder in a combined CBT and ST intervention.

Post-traumatic stress disorder (PTSD) in war veterans

Only one study met inclusion criteria which used schema therapy in PTSD. Schema-focused therapy was piloted in individuals with PTSD who were veterans of the Vietnam War and inpatient and outpatient participants (Cockram *et al.*, 2010). In this study, individuals with PTSD participated in a group treatment which included schema-focused therapy. The CTAM assessment for this study highlighted the use of a historical comparison group, rather than a contemporary control group, a lack of randomization, and an absence of independent rater assessment resulting in a score of 16/100. However, seventeen schemas decreased significantly after treatment on the long form schema questionnaire (mean $d = 0.33$). PTSD improved significantly for the schema-focused group ($d = 0.81$) on the PTSD military checklist (Forbes, Creamer, & Biddle, 2001) compared to the comparison group ($d = 0.59$) from intake to 3-month follow-up. This is the first study to explore schema change and symptom reduction with ST for veterans with PTSD.

Depression

Similar to PTSD, only one study met inclusion criteria to focus on schema therapy for depression. Malogiannis *et al.* (2014) examined schema therapy for chronic depression in a case series study. The study was rated using the CTAM and scored 31/100, due to absence of a control or comparison group and a lack of randomization, and although an independent rater of outcome was used, it was not possible for this to be blinded. There were modest and non-significant changes for schema when comparing baseline to end-of-therapy session scores. However, the schema scores demonstrated large and significant change when comparing baseline to follow-up, with an effect size of 1.1. The depression scores reduced from baseline to 6-month follow-up on the Hamilton Rating Scale for Depression, with an effect size of 2.2. This is the first study to examine the use of schema therapy in individuals with chronic depression.

Other disorders not retrieved

There were no studies which met inclusion criteria examining schema therapy and schema change in any other Axis I or Axis II disorders.

Schema change and symptom change correlation

Of the twelve studies identified, only three report correlational analyses between schema and outcome measures (Hoffart *et al.*, 2002; van Vreeswijk *et al.*, 2014; Videler *et al.*, 2014). van Vreeswijk *et al.* (2014) conducted synchronous correlations which demonstrated a significant association between pre-therapy to mid-therapy changes in YSQ with

pre-therapy to mid-therapy changes in the Global Severity Index, $r(59) = .44; p = .001$. This was also the case for mid-therapy changes to end-of-therapy changes in the YSQ scores with mid-therapy to end-of-therapy changes in the GSI, $r(45) = .72; p = .001$. Videler *et al.* (2014) found a significant correlational association between pre-therapy to mid-therapy changes in YSQ with pre-therapy to mid-therapy changes in BSI, $r(31) = .58; p < .01$. This was also the case for mid-therapy to end-of-therapy changes in YSQ with mid-therapy and end-of-therapy changes in BSI scores, $r(31) = .700 p < .01$. Finally, Hoffart *et al.* (2002) report correlations between the slopes across sessions of post-therapy schema belief change and distress and post-therapy and mid-therapy change in relation to schema belief change and distress. They found that post-sessional distress and post-sessional schema belief were significantly associated $r(35) = .50 p < .001$.

CTAM scores

The CTAM was used to assess each of the studies' methodological quality. The total scores ranged between 16 and 81, with a mean score of 26.3 ($SD = 18.1$; see Table 1). One study examining BPD scored above the cut-off of 65 was proposed as being indicative of an adequately designed study (Nadort *et al.*, 2009). As the remaining studies in other disorders were designed as case series or open trials, they were limited from achieving high scores on the CTAM measure. The majority of studies had small sample sizes, and only one (Nadort *et al.*, 2009) reported a power calculation. The majority lacked independent rater assessment and by virtue of the design lacked single rater blinding to reduce risk of bias and inflation of effect sizes. Only two studies had a control or comparison group (Cockram *et al.*, 2010; Nadort *et al.*, 2009), both of which were historical comparison groups (one to a published trial and the other a historical clinic group).

Discussion

This review aimed to assess whether schema therapy interventions changed schemas and symptoms across disorders. The results of the search found twelve studies meeting inclusion criteria. Eleven of these studies suggested that schemas changed as part of the schema therapy interventions. Furthermore, symptom change was also found in each of these 11 studies. One study did not demonstrate schema change (George *et al.*, 2004) but did demonstrate some symptom improvement. Three studies examined correlations between schema change and symptom change. While these correlations do not offer strong evidence for mediation (i.e., the indirect effect of schema therapy on outcomes mediated by schema change), they do at least suggest some relationship between schema change and symptom change.

Measures of schema

There were a variety of measures of schema utilized across the studies. These included the Young Schema Questionnaire (YSQ; Young, 1990) in 11 studies, although the versions described varied from the short form (1998) to the long form (Young & Brown, 1990). The third version of the YSQ added three schemas due to revisions to the theoretical model. Two studies also used the Schema Mode Inventory (SMI; Young *et al.*, 2007). The YSQ and SMI measure different aspects of the schema model, offering differing evidence of change as a result of schema therapy. This makes it more difficult to carefully compare the results

of different studies. The schema measures also varied in how they were reported. For example, some studies reported the overall schema scores, while others were more detailed in reporting subscales of specific EMS or dysfunctional schema modes. Future studies would benefit from including both the YSQ and SMI. Alternatively, future studies would benefit from a consensus developing on which measure best reflects the targeted processes which schema therapy seeks to change. Reporting on both overall scores and individual subscales would also be beneficial and add to theoretical understanding in specific disorders.

Number of therapy sessions

The number of sessions in some studies was not clearly reported. However, both briefer and longer versions of schema therapy resulted in change. Estimating sessions over a number of weeks was more challenging and did not account for any sessions, which may be missed as a result of leave arrangements, illness, etc. This meant trying to compare the number of sessions across studies was more challenging, and additional questions of interest, such as how many sessions resulted in schema change, were more difficult to explore. The variable length observed in intervention administration is an important finding, as some of the shorter studies also appeared to demonstrate benefits for some disorders. This suggests that schema change and symptom change may be possible with a more modest number of sessions, patient, and economic benefits.

Clinical trial assessment measure

The CTAM was used to assess the quality of each study, and overall, study quality was low, limiting the application of current evidence base to clinical practice where schema change is a specific goal. Future work would benefit from rigorously conducted trials that ensure appropriate comparison groups, randomization, independent rater blinding, and large participant groups.

From the studies reviewed, particularly for personality disorders, effect sizes for change of EMS and maladaptive schema modes were promising (particularly, the Nadort *et al.*, 2009 study), suggesting the potential for ST as a treatment. However, a common finding across many treatment studies is that early phase pilots report large effect sizes which have been noted to decrease in magnitude when evaluated in more rigorously designed RCTs (Wykes *et al.*, 2008). A number of highlighted CTAM criteria being used would have improved the methodological rigour of the smaller studies.

Limitations of the review process

This is the first review to examine the effect of schema therapy on schema change and symptom change in a range of mental health disorders. The review was limited by a small number of studies which met inclusion criteria, only one of which was a randomized trial. The review may also have been limited by publication bias that the studies conducted which found an effect were more likely to be published, while those which did not may not have been published. However, such biases are not uncommon in systematic reviews and rely on the quality and reporting of the primary studies. Also, several studies described have quite small standard deviations reported. This is important to consider, as small standard deviations tend to inflate the effect sizes and future studies should reflect this issue when reporting results.

Future directions

There are a number of ways that future studies of schema therapy could be designed to allow empirical questions of efficacy, mediators, and moderators of schema therapy to be examined. In addition to well-designed randomized controlled trials demonstrating that schema therapy is clinically effective and significantly affects schemas, the next stage would be to establish if schema change as part of schema therapy mediates outcomes and if this schema change indirectly affects outcomes. Such a study design would include a two-group comparison and at least three assessment time points to determine whether schema change precedes any later clinical improvement (Kraemer, Wilson, Fairburn, & Agras, 2002). Thus, future studies which incorporated a control or comparison group and measured schema change at multiple time points would allow schema change to be established as the mechanism for change.

We would propose a number of suggestions together as a strategy to resolve some of the issues identified. Firstly, ensure that all studies measure both schemas and symptoms, ideally with both a measure of EMS and a measure of schema modes. Secondly, underpowered trials are common and so given recruitment and funding issues, collaborative studies across more than one site and with more than one team working with the same treatment manual, and protocol would help to ensure that trials have sufficient participants to detect an effect. Thirdly, recruiting additional participants to have a treatment as usual comparison group, independent randomization to reduce allocation bias, and using blind assessors would all enhance the robustness of the findings (and CTAM scores for such trials). Fourthly, few of the studies were preregistered in a publically available database, and thus, preregistration would ensure studies with unfavourable results are not lost and reduce other possible biases (e.g., outcome switching). Fifthly, given that individual schema therapy can be a longer-term and more resource-intensive psychotherapy approach, future studies may specifically wish to test schema therapy for patients where standard CBT treatment has failed (i.e., patients with residual symptoms). Sixthly, inclusion criteria may also include a specific level or threshold of EMS schema or negative schema modes, given that it is problematic schemas which are targeted. Seventhly, trials should follow CONSORT best practice to improve quality of reporting, including any future therapy-specific reporting guidelines to ensure clear description and to reduce ambiguity around how a trial was conducted (e.g., Mayo-Wilson *et al.*, 2013). Eighthly, given increasing pressures on healthcare funding, large-scale studies should include health economic measures to inform evaluation and allow cost-effective analyses. Ninthly, despite historical assumptions of the safety of psychological treatments, schema therapy trials, as with all trials of new psychotherapy interventions, should monitor any potential adverse effects of the therapy (Hutton, 2016; Jonsson, Alaie, Parling, & Arnberg, 2014).

Clinical implications

This review focused upon schema change and symptom change in schema therapy, rather than a wider review specifically focused on efficacy of all studies of schema therapy, regardless of whether schema change was measured or not. The Sempértegui's *et al.* (2013) review found wider evidence that schema therapy may be an effective treatment for clinicians looking to reduce distress in clients with personality disorder. However, the current review has demonstrated that there is limited existing evidence that schema therapy may be a useful tool for schema change

in other mental health disorders such eating disorders, agoraphobia, post-traumatic stress disorder, and chronic depression.

Conclusion

In conclusion, this review found initial low-quality evidence for schema change in schema therapy interventions in studies of personality disorder and that symptom change appeared to accompany schema change. Thus, schema therapy appears to achieve change in the problematic EMS, and schema modes proposed as maintaining distress in personality difficulties and other wider reviews confirm that it is a promising approach. However, as demonstrated in this current review, only three studies conducted correlational analyses and there is a lack of formal mediation analytical studies to support schema change as an underlying mechanism of schema therapy. There is very limited good quality evidence of schema therapy and schema change being associated for eating disorders, agoraphobia, PTSD and chronic depression. In its current form, the evidence is insufficient to inform and advance evidence-based intervention. Preliminary evidence is available, and clinicians and service users engaging in using schema therapy should do so under the proviso that service user/patient preference, clinical expertise, and/or the theoretical underpinnings of schema therapy warrant its use rather than on being based on demonstrable evidence of efficacy at this time.

Funding

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Supporting Information

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

Appendix S1. Excluded studies.