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Can Psychological Interventions Reduce Perfectionism? A Systematic Review and Meta-analysis

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Background: Perfectionism is implicated in a range of psychiatric disorders, impedes treatment and is associated with poorer treatment outcomes. **Aims:** The aim of this systematic review and meta-analysis was to summarize the existing evidence for psychological interventions targeting perfectionism in individuals with psychiatric disorders associated with perfectionism and/or elevated perfectionism. **Method**: Eight studies were identified and were analysed in meta-analyses. Meta-analyses were carried out for the Personal Standards and Concern over Mistakes subscales of the Frost Multi-Dimensional Perfectionism Scale (FMPS) and the Self Orientated Perfectionism and Socially Prescribed Perfectionism subscales of the Hewitt and Flett MPS (HMPS) in order to investigate change between pre and postintervention. **Results:** Large pooled effect sizes were found for the Personal Standards and Concern over Mistakes subscales of the FMPS and the Self Orientated Perfectionism subscale of the HMPS, whilst a medium sized effect was found for change in Socially Prescribed Perfectionism. Medium pooled effect sizes were also found for symptoms of anxiety and depression. **Conclusions:** There is some support that it is possible to significantly reduce perfectionism in individuals with clinical disorders associated with perfectionism and/or clinical levels of perfectionism. There is also some evidence that such interventions are associated with decreases in anxiety, depression, eating disorder and obsessive compulsive symptoms. Further research is needed in order to investigate the optimal dosage and format of such interventions as well as into specific disorders where there is a lack of evidence for their effectiveness.

Keywords: Perfectionism, systematic review, meta-analysis, cognitive behavioural therapy.

Background

Perfectionism is a personality feature characterized by the setting of extremely high and demanding performance standards, which a perfectionist individual strives for and bases their self-evaluation upon (Frost, Marten, Lahart and Rosenblate, 1990). Despite ongoing debate regarding the most appropriate conceptualization, there is general consensus that perfectionism is best understood as a multi-dimensional construct (e.g. Frost et al., 1990; Hewitt and Flett, 1991; Dunkley, Zuroff and Blankstein, 2003).

In line with this, self-report multi-dimensional measures of perfectionism were developed by Frost et al. (1990) and Hewitt and Flett (1991). The Frost Multi-dimensional Perfectionism

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Scale (FMPS) assesses the following aspects of perfectionism: concern over mistakes, personal standards, doubts about actions, parental expectation, parental criticism and order. The Hewitt and Flett Multi-dimensional Perfectionism Scale (HMPS) measures self-oriented perfectionism, socially prescribed perfectionism, and other oriented perfectionism. Factor analyses of these widely used measures have identified two underlying factors: "maladaptive evaluative concerns" and "positive achievement striving" (Frost, Heimberg, Holt, Mattia and Neubauer, 1993; Cox, Enns and Clara, 2002). Maladaptive perfectionism is characterized by evaluative concerns, worry and socially prescribed aspects of perfectionism, whilst adaptive perfectionism concerns positive striving, high personal standards and self-oriented perfectionism (Enns and Cox, 1999; Bieling, Israeli, Smith and Antony, 2003; Rice, Ashby and Slaney, 1998).

Whilst there is some evidence that achievement striving aspects of perfectionism are associated with positive outcomes (Stoeber and Otto, 2006 for review), numerous studies have found a robust link between both positive achievement striving and maladaptive evaluative concerns perfectionism and eating disorders (EDs; Egan, Wade and Shafran, 2011) and both self-oriented perfectionism and personal standards have been found to be associated with negative outcomes and symptoms of depression and anxiety (Egan et al., 2011). In line with this, an alternative definition of perfectionism was proposed by Shafran, Cooper and Fairburn (2002). Within their cognitive behavioural model of perfectionism, "clinical perfectionism" is defined as "the overdependence of self-evaluation on the determined pursuit of personally demanding self-imposed standards in at least one highly salient domain despite adverse consequences." Within this model, personal standards are regarded as maladaptive when an individual's self-evaluation is based upon meeting these standards.

Perfectionism has important implications for clinical practice, having been implicated in the development and maintenance of a range of disorders including depression, anxiety, EDs and body dysmorphic disorder (BDD) (Shafran and Mansell, 2001; Egan et al., 2011). It is associated with suicidality (Jacobs et al., 2009); self-harm (O'Connor, Rasmussen and Hawton, 2010); insomnia (Vincent and Walker, 2000), social phobia (Juster et al., 1996) and Obsessive Compulsive Disorder (OCD; Frost and Steketee, 1997) and is proposed as an explanation for comorbidity across disorders (Bieling, Israeli and Antony, 2004; Egan et al., 2011). Perfectionism is also known to impede successful treatment of depressive disorder (Blatt, Quinlan, Pilkonis and Shea, 1995), anxiety disorders (Chik, Whittal and O'Neil, 2008) and EDs (Sutandar-Pinnock, Woodside, Carter, Olmsted and Kaplan, 2003). It has been suggested that targeting perfectionism may result in symptom reduction across a range of disorders (Bieling et al., 2004; Shafran et al., 2002).

Aims

The aim of this review was to determine the efficacy of interventions explicitly targeting perfectionism in reducing levels of perfectionism in adults or children with a primary problem of a psychiatric disorder and/or clinically significant perfectionism. Given the multi-dimensional conceptualization of perfectionism and limited knowledge on the extent to which perfectionism can be reduced through interventions, a further aim was to investigate which aspects of perfectionism are amenable to change. Due to the purported transdiagnostic nature of perfectionism and relevance to a range of disorders, this review also aimed to investigate change in other symptoms (e.g. anxiety, depression, ED symptoms).

Method

This systematic review was reported according to the "PRISMA statement" (Moher, Liberati, Tetzlaff and Altman, 2009).

Eligibility criteria for selecting studies

Studies of interventions targeting perfectionism published in peer reviewed journals in English were included, in order that it was possible to access and fully review whole papers. Studies were eligible if they included an intervention explicitly targeting perfectionism. Studies involving interventions of either individual or group format and of any treatment modality were eligible. Studies of interventions involving multiple sessions were included. Studies including participants with any psychiatric disorder, and/or with clinically relevant levels of perfectionism, as defined by scores on an established perfectionism measure (e.g. semi-structured interview, score above a defined cut-off or in relation to a control sample) were eligible. See Table 1 for method of defining clinically relevant perfectionism for each study. Studies without a control group were included – as the focus was upon change between pre and postintervention – as were studies with any type of control group. Case series were included if group means and standard deviations were presented or sufficient data for these to be calculated. Studies were excluded if interventions did not explicitly target perfectionism. Studies were also excluded if participants did not have either a clinical disorder or elevated perfectionism.

Information sources and search strategy

Electronic databases of PsychInfo, PubMed, Medline, EMBASE, SCOPUS and Web of Knowledge were searched up to February 2014 using the following keywords: ("intervention" or "treatment" or "therapy") and "perfectionism". The search was repeated combining the names of established perfectionism measures with intervention terms.

Study selection

The search identified 1183 studies, with 32 studies identified as potentially relevant based upon title and abstract. Full papers were selected for 14 studies. Four studies were excluded as participants did not have either a psychiatric disorder or elevated perfectionism, or this was not specified (Wilksch and Wade, 2013; Wilksch, Durbridge and Wade, 2008; Kutlesa and Arthur, 2008; Kearns, Forbes and Gardiner, 2007). One study was excluded due to not including an intervention of multiple sessions (Aldea, Rice, Gormley and Rojas, 2010) and one study because it did not investigate change at group level (Ferguson and Rodway, 1994). Of eight eligible studies, several included multiple measures of perfectionism and were therefore included in more than one meta-analysis. A quality review of studies was conducted (see Table 2). Figure 1 shows a study flow diagram in line with PRISMA.

Summary of outcome measures: Perfectionism

Frost Multi-Dimensional Perfectionism Scale (FMPS; Frost et al., 1990) assesses multiple dimensions of perfectionism. A mean clinical cut-off of 24.7 on the CM subscale was established based upon the mean of anxiety disorder samples in a review by Egan et al. (2011).

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Table 1. Study characteristics for eligible studies

Study	Design	Total *N*	Treatment modality (*N*)	Control group(s) (*N*)	*N* sessions	Participant characteristics	Details of intervention	Perfectionism measure	Depression measure	Anxiety measure
Glover, Brown, Fairburn and Shafran (2007)	Case series	9	Individual CBT (9)	None	Range of 10 – 14 sessions of 50 minutes over range of 7 – 11 weeks.	Clinical level perfectionism, assessed using semi-structured interview for clinical perfectionism (Riley and Shafran, 2005) and scoring at least one SD above the mean of a non perfectionist non clinical group on CPQ. Participants also had a diagnosis of depression, anxiety, CFS, or BDD (N not specified).	Manualized intervention. Content: a personalized formulation in terms of clinical perfectionism; broadening the patient's scheme for self-evaluation; using behavioural experiments to test competing hypotheses; using cognitive-behavioural methods to address personal standards, self-criticism and cognitive biases that maintain clinical perfectionism.	CPQ, HMPS: all subscales	BDI-II	BAI

Table 1. Continued.

Study	Design	Total *N*	Treatment modality (*N*)	Control group(s) (*N*)	*N* sessions	Participant characteristics	Details of intervention	Perfectionism measure	Depression measure	Anxiety measure
Pleva and Wade (2007)	RCT	45	CBT based guided self-help (24)	Pure self-help (25)	8 sessions of 50 minutes, weekly.	Participants with clinical perfectionism defined as scoring above 84 on Frost MPS total score (based on previous study of clinical population by Frost and Steketee, 1997).	Therapist assisted participant in working through exercises, setting tasks and homework based upon self-help book *When Perfect Isn't Good Enough* (Antony and Swinson, 1998). Content: emphasis on identifying and challenging perfectionist thought and behaviours.	FMPS: all subscales	DASS	DASS

Table 1. Continued.

Study	Design	Total *N*	Treatment modality (*N*)	Control group(s) (*N*)	*N* sessions	Participant characteristics	Details of intervention	Perfectionism measure	Depression measure	Anxiety measure
Riley, Lee, Cooper, Fairburn and Shafran (2007)	RCT	20	Individual CBT (10)	Waiting list (10)	10 sessions of 50 minutes over 8 weeks.	Met criteria for clinical perfectionism, according to semi-structured interview (Clinical Perfectionism Examination, CPE) based on Shafran et al. (2002). 6 met criteria for Axis 1 diagnosis (not specified).	Manualized intervention adapted from module of CBT treatment for EDs (Fairburn et al., 2003). Content: identifying perfectionism as a problem and establishing maintaining mechanisms; conducting behavioural experiments; psycho-education and cognitive restructuring; broadened scheme for self-evaluation.	CPQ, FMPS	BDI-II	BAI

Table 1. Continued.

Study	Design	Total *N*	Treatment modality (*N*)	Control group(s) (*N*)	*N* sessions	Participant characteristics	Details of intervention	Perfectionism measure	Depression measure	Anxiety measure
Egan and Hine (2008)	Case series	4	Individual CBT (4)	None	8 sessions of one hour, weekly	Diagnosis of anxiety or depression plus elevated perfectionism determined by a score of 70 or above (based on findings of study by (Shafran and Mansell, 2001) of clinical sample with anxiety disorders. Anxiety = 2, depression = 1, mixed anxiety and depression = 1.	Cognitive behavioural techniques to target mechanisms responsible to maintaining perfectionism. Behavioural experiments to test negative cognitions about changing perfectionism; thought records to challenge selective attention hypervigilant monitoring of performance and self-criticism.	FMPS: total, CM, PS	BDI	BAI

Table 1. Continued.

Study	Design	Total *N*	Treatment modality (*N*)	Control group(s) (*N*)	*N* sessions	Participant characteristics	Details of intervention	Perfectionism measure	Depression measure	Anxiety measure
Steele and Wade (2008)	RCT	48	CBT based guided self-help (15)	CBT for BN (17); Placebo (16)	8 sessions of 40 minutes, over 6 weeks.	Diagnosis of BN ($N = 10$) or EDNOS ($N = 7$).	Participants guided through content of self-help book *When Perfect Isn't Good Enough* (Antony and Swinson, 1998) by therapist. Content: details not given.	FMPS: CM, PS	DASS	DASS

Table 1. Continued.

Study	Design	Total *N*	Treatment modality (*N*)	Control group(s) (*N*)	*N* sessions	Participant characteristics	Details of intervention	Perfectionism measure	Depression measure	Anxiety measure
Arpin-Cribbie, Irvine and Ritvo (2012)	RCT	77	Web-based psycho-educational CBT (29)	General stress management (26); Waiting list (22)	Web-based materials available for 10 weeks	Elevated perfectionism, defined as PCI score greater than one SD above sample mean.	Materials available online with suggested order and homework. Content: exploring perfectionist interpretations, examining and re-evaluating expectations; recognizing distress causes by certain ways of thinking; dealing with negative moods; keeping perspective; dealing with academic and performance anxiety.	FMPS: CM; HMPS, APSR: D; PCI	CESD	BAI

Table 1. Continued.

Study	Design	Total *N*	Treatment modality (*N*)	Control group(s) (*N*)	*N* sessions	Participant characteristics	Details of intervention	Perfectionism measure	Depression measure	Anxiety measure
Radhu et al. (2012)	RCT	15	Individual CBT (7)	Waiting list (8)	12 weekly sessions, length not specified.	Elevated perfectionism, defined as PCI score ≥66.	Content: 13 modules around modifying perfectionist beliefs and associated effects on mood.	FMPS – CM, DA; HMPS–SOP, SPP; APSR: D, HS; PCI	CESD	BAI

Table 1. Continued.

Study	Design	Total *N*	Treatment modality (*N*)	Control group(s) (*N*)	*N* sessions	Participant characteristics	Details of intervention	Perfectionism measure	Depression measure	Anxiety measure
Steele, Waite, Egan, Finnigan, Handley and Wade (2013)	Case series	21	Group CBT (21)	Baseline period of self-help psycho-education (21)	8 sessions of 2 hours over 8 weeks.	Elevated perfectionism, defined as total FMPS score ≥22 or mean item score of ≥2.44. Also met criteria for Axis I disorder = 14 depression in remission = 5; major depressive disorder = 4, social phobia = 3, panic disorder = 2; dysthymia = 2, GAD = 2, OCD = 1.	Content based on self-help book *Overcoming Perfectionism* (Shafran, Egan and Wade, 2010). Included: costs and benefits of change, psycho-education, behavioural experiments to challenge perfectionist beliefs, identifying cognitive distortions, cognitive restructuring, relapse prevention.	CPQ; FMPS: CM, PS	DASS: com-bined	

Notes: APSR: Almost Perfect Scale Revised, D: Discrepancy subscale; HS: High Standards; CPQ: Clinical Perfectionism Scale; HMPS:Hewitt & Flett Multidimensional Perfectionism Scale. SOP: Self Orientated Perfectionism, SPP: Socially Prescribed Perfectionism; PCI: Perfectionism Cognitions Inventory; FMPS: Frost Multidimensional Perfectionism Scale. CM: Concern over Mistakes subscale, PS: Personal Standards subscale; BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; CESD: Centre for Epidemiologic Studies-Depressed Mood Scale; DASS: Depression Anxiety Stress Scale; BDD: Body Dysmorphic Disorder; CFS: Chronic Fatigue Syndrome; GAD: Generalized Anxiety Disorder

Table 2. Assessment of quality table for all included studies

Study	Randomization	Generation of random numbers	Allocation concealment	Blinding	Incomplete outcome data	Method for dealing with attrition
Glover, Brown, Fairburn and Shafran (2007)	No – multiple baseline case series.	N/A	N/A	N/A	None	N/A
Pleva and Wade (2007)	Yes	Computer generated block randomization.	Yes, revealed after participant consent and baseline measures.	No details given.	3 / 24 (12.5%)	Intention to treatment analysis
Riley, Lee, Cooper, Fairburn and Shafran (2007)	Yes	Allocation made using a computer generated random number list.	Yes, revealed after participant consent.	All measures and assessments conducted blind by assessor at pre-treatment, post-treatment, and follow-up.	2 / 20 (10%)	Intention to treatment analysis
Egan and Hine (2008)	No - case series experimental design	N/A	N/A	N/A	None	N/A

Table 2. Continued.

Study	Randomization	Generation of random numbers	Allocation concealment	Blinding	Incomplete outcome data	Method for dealing with attrition
Steele and Wade (2008)	Yes	Computer generated block randomization.	No	All EDE assessments were audio recorded and delivered by trained interviewers blind to treatment allocation.	2 / 17 participants (11.76%) didn't receive the intervention; 2 (11.76%) non completers.	Exclusion from analysis. Analyses revealed no significant differences between those receiving / not receiving treatment and treatment completers and non-completers.
Arpin-Cribbie, Irvine and Ritvo (2012)	Yes	Random assignment using random number table.	Yes, not possible for researcher to identify which group participant assigned based on questionnaire package.	Researcher blind to group allocation.	None	N/A
Radhu et al. (2012)	Yes	Details not given.	No	No	4/24 lost to follow-up (16.7%) lost to follow-up.	Exclusion from analysis.
Steele et al. (2013)	No	N/A	N/A	N/A	2 / 21 (9.5%) non completers.	Multi-level analysis

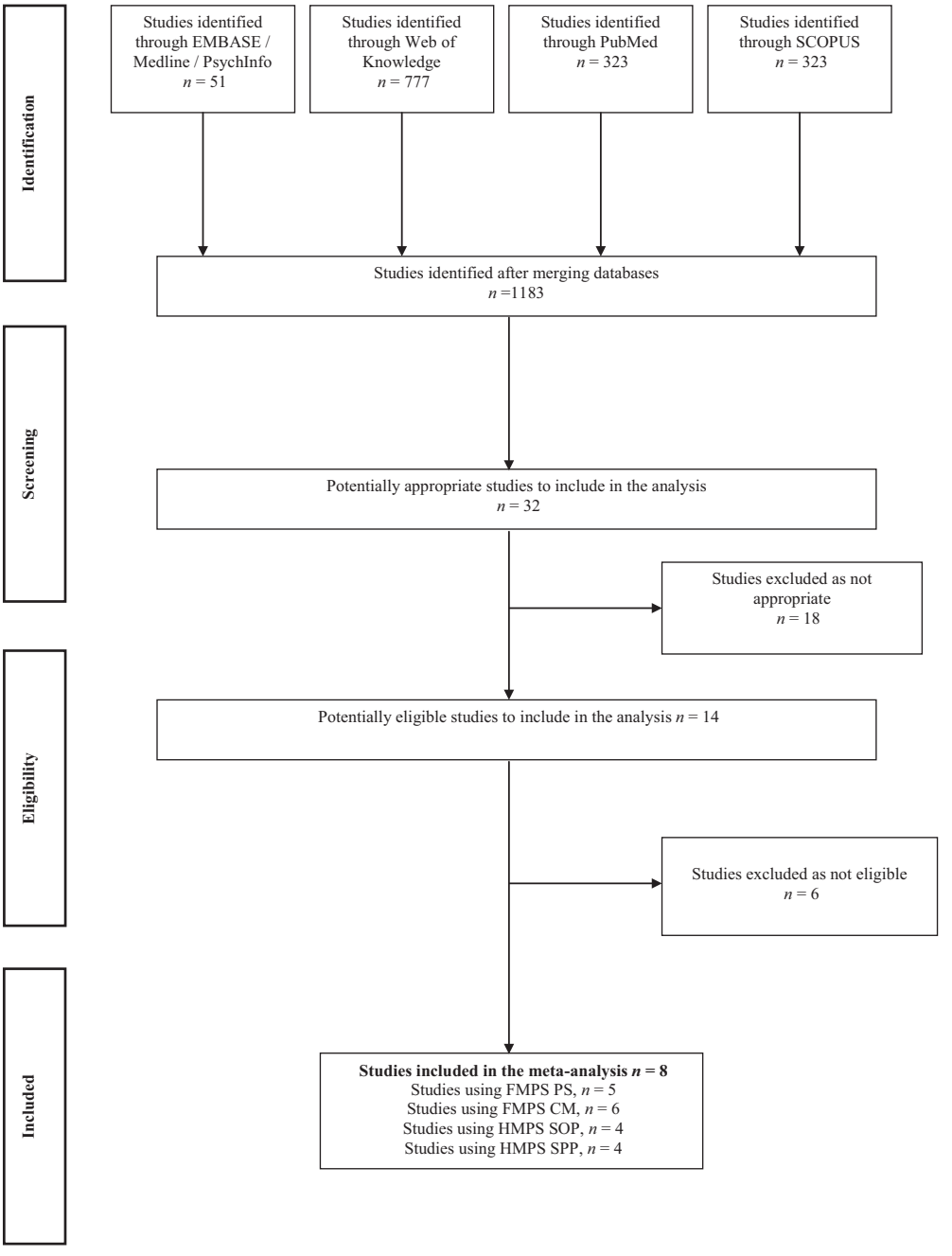

Figure 1. Study flow diagram in line with PRISMA

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Hewitt and Flett Multi-Dimensional Perfectionism Scale (HMPS; Hewitt and Flett, 1991) assesses three dimensions of perfectionism. Whilst no established clinical cut-offs exist, Hewitt, Flett, Turnbull-Donovan and Mikail (1991) found mean scores of 70 and 59 for the SOP and SPP scales in a clinical sample.

Clinical Perfectionism Scale (CPQ; Fairburn, Cooper and Shafran, unpublished, cited in Riley, Lee, Cooper, Fairburn and Shafran, 2007). Assesses cognitive, behavioural and affective aspects of perfectionist goal setting, striving and consequences for self-evaluation.

Almost Perfect Scale Revised (APS-R; Slaney, Rice, Mobley, Trippi and Ashby, 2001) assesses adaptive (High Standards) and maladaptive (Discrepancy) dimensions of perfectionism. Scores of 42 or above on discrepancy indicate clinical levels of perfectionism, with a cut-off of 37 established for HS (Rice and Ashby, 2007).

Perfectionism Cognitions Inventory (PCI; Flett, Hewitt, Blankstein and Gray, 1998) is a measure of the frequency of "automatic perfectionistic thoughts"; scores above 66 indicate clinical levels.

Symptom measures

Depression and anxiety. The following measures of anxiety and depression were included: Depression Anxiety Stress Scale (DASS; Lovibond and Lovibond, 1995); Center for Epidemiological Studies Depression Scale (CESD; Radloff, 1977); Beck Depression Inventory-II (BDI-II; Beck, Steer and Brown, 1996) and the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown and Steer, 1988). Increased scores on measures indicate higher symptom severity.

ED symptoms. The Eating Disorder Examination (EDE; Fairburn and Beglin, 1994) is a semi-structured interview assessing frequency of behavioural symptoms and ED related cognitions. It consists of four subscales assessing restraint, eating concern, shape concern, and weight concern. Higher scores indicate increased severity.

Obsessive compulsive symptoms. The following measures of obsessive compulsive symptoms were included in studies within the review: the Maudsley Obsessional-Compulsive Inventory (MOCI; Hodgson and Rachman, 1977); Padua Inventory-Washington State University Revision (PI-WSUR, Burns, Keortge, Formea and Sternberger, 1996) and the Responsibility Attitude Scale (RAS; Salkovskis et al., 2000). Higher scores indicate greater symptomatology.

Synthesis of data

Means and standard deviations for pre and postintervention scores were taken from each paper. Where standard errors (SE) were reported, standard deviation (SD) was calculated. Mean differences between pre and postintervention scores were standardized by the pooled standard deviation to calculate Hedges' g (difference between pre and postintervention scores divided by pooled *SD*; Hedges, 1981). The following values correspond to relative effect sizes: small ($g = 0.2$), medium ($g = 0.5$) and large ($g = 0.8$). For studies that were commented on only, where effect sizes were reported as Cohen's d, Hedges' g was calculated to allow comparison between studies. Effect sizes for studies are shown in Tables 3 and 4.

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Table 3. Perfectionism measures: effect sizes[a] of each study included in the meta-analyses (FMPS CM, FMPS PS, HMPS SOP, HMPS-SPP)

	FMPS PS		FMPS CM		HMPS SOP		HMPS SPP	
Study	*g*	CIs	*g*	CIs	*g*	CIs	*g*	CIs
Glover et al. (2007)	–	–	–	–	0.94	− 0.05, 1.93	0.26	− 0.67, 1.19
Pleva and Wade (2007)	0.54	− 0.03, 1.12	1.31	0.68, 1.93	–	–	–	–
Riley et al. (2007)	–	–	–	–	0.68	− 0.23, 1.58	0.50	− 0.39, 1.39
Egan and Hine (2008)	0.69	− 0.77, 2.16	− 1.07	− 0.50, 2.64	–	–	–	–
Steele and Wade (2008)	0.53	− 0.20, 1.26	1.36	0.55, 2.16	–	–	–	–
Arpin-Cribbie, Irvine and Ritvo (2012)	–	–	1.40	0.82, 1.985	1.17	0.61, 1.73	0.75	0.21, 1.28
Radhu et al. (2012)	0.37	− 0.69, 1.43	1.22	0.04, 2.39	− 0.53	− 1.60, 0.54	− 0.03	− 1.03, 1.02
Steele et al. (2013)	1.62	0.91, 2.32	1.32	0.65, 2.00	–	–	–	–

[a]Standardized effect sizes according to weighting of studies in meta-analyses

FMPS CM: Frost Multidimensional Perfectionism Scale: Concern over Mistakes subscale; FMPS PS: Frost Multidimensional Perfectionism Scale: Personal Standards subscale; HMPS SOP: Hewitt and Flett Multidimensional Perfectionism Scale: Self Orientated Perfectionism; HMPS SPP: Hewitt and Flett Multidimensional Perfectionism Scale: Socially Prescribed Perfectionism

Table 4. Anxiety and depression measures: effect sizes[a] of each study included in the meta-analyses

	Anxiety		Depression	
Study	*g*	CIs	*g*	CIs
Glover et al. (2007)	0.32	− 0.61, 1.25	0.41	− 0.52, 1.35
Pleva and Wade (2007)	0.39	− 0.18, 0.96	0.73	0.14, 1.31
Riley et al. (2007)	0.15	− 0.73, 1.03	0.78	− 0.14, 1.69
Egan and Hine (2008)	0.86	− 0.65, 2.36	0.23	− 1.17, 1.62
Steele and Wade (2008)	2.68	1.66, 3.71	1.12	0.35, 1.90
Arpin-Cribbie, Irvine and Ritvo (2012)	0.21	− 0.31, 0.73	0.49	− 0.03, 1.01
Radhu et al. (2012)	0.56	− 0.52, 1.63	0.41	− 0.66, 1.47

[a]Standardized effect sizes according to weighting of studies in meta-analyses

Analyses were conducted using STATA 11 (Stata Corp, College Station, TX, USA) using the metan command (Bradburn, Deeks and Altman, 1998; Harris et al., 2008). Scales were included in the analyses where internal reliability of the measure was acceptable or above in the included studies (Cronbach's alpha = ≥ 0.70; Nunnally and Bernstein, 1994). Analysis for perfectionism measures was conducted separately for each subscale as we were interested in which aspects of perfectionism were found to change in response to interventions. For perfectionism outcomes, meta-analyses were carried out for PS and CM subscales of the FMPS and SOP and SPP subscales of the HMPS by pooling the standard effect sizes using a random effects model. Meta-analyses were also carried out to investigate change in depressive and anxiety symptoms across different measures.

Results

Study characteristics

All studies used a cognitive behavioural based intervention (for specific details see Table 1). Four studies involved individual interventions, two guided self-help, one web-based intervention and one group format CBT. Interventions varied in the number of sessions delivered, ranging between 8 BDD and 14 sessions. All studies involved adults. The samples of four studies included participants with clinical disorders, including depression, anxiety, chronic fatigue syndrome, OCD, BDD, bulimia nervosa and Eating Disorder Not Otherwise Specified (EDNOS). One study included a mixed sample of patients with clinical disorders and participants with elevated perfectionism. Three studies included participants with elevated perfectionism.

Heterogeneity

I^2 (Higgins, Thompson, Deeks and Altman, 2003) was calculated as a measure of heterogeneity between studies due to small sample sizes, based on Cochran's Q test: measure of heterogeneity, $I^2 = 100\%$ x (Q-*df*)/Q. I^2 ranges between 0% indicative of no inconsistency and 100% indicative of high heterogeneity. There was no evidence of heterogeneity between studies using the FMPS CM subscale, HMPS SPP subscale, or those reporting anxiety and

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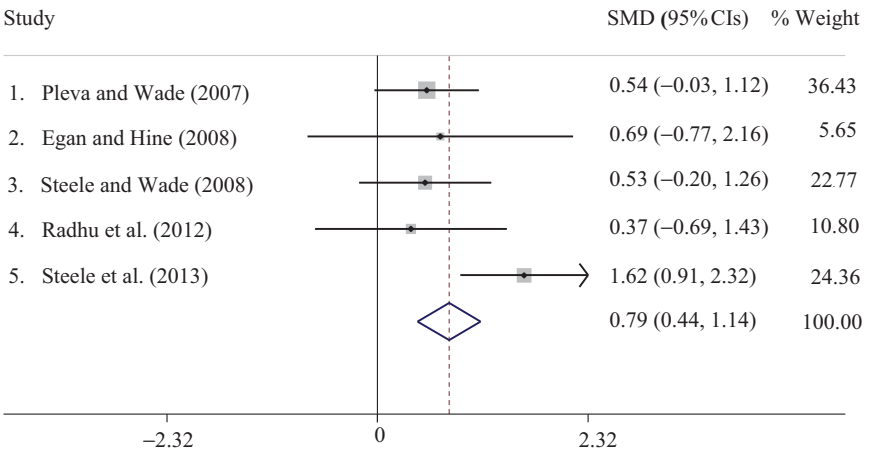

Figure 2. (Colour online) Forest plot for FMPS PS subscale: standardized effect sizes for change between pre and postintervention

depression outcomes (all I^2 = 0.0%). There was evidence of heterogeneity for the FMPS PS subscale ($I^2 = 43.8\%$) and HMPS SOP subscale ($I^2 = 61.3\%$).

Publication bias

Egger tests (Egger, Smith, Schneider and Minder, 1997) were carried out using the user contributed STATA command meta bias and funnel plots generated to investigate the presence of publication bias for perfectionism outcomes. No evidence was found for FMPS CM and PS subscales ($p = .22$; 0.939 respectively), nor HMPS SOP ($p = .25$). For the HMPS SPP a trend was detected ($p = .07$). These results should be interpreted with caution due to the small number of studies.

Synthesis of results

Perfectionism: FMPS. The FMPS was the most widely used measure (seven studies). Three studies reported all subscales. Two studies reported the CM and PS subscales only, one study reported total score plus these two subscales combined and one study reported CM only. Meta-analyses were carried out separately on the five studies reporting PS and six studies reporting CM. Riley et al. (2007) was excluded from the meta-analysis as the two subscales were not reported separately. Two studies included the DA subscale and are commented upon only.

Personal Standards (PS). Five studies used the PS subscale ($N = 71$), with the meta-analysis showing a pooled standardized mean difference between pre and postintervention of $g = 0.79$, a large effect size (CIs = 0.44 – 1.12). Figure 2 shows the pooled and individual effect sizes for relevant studies.

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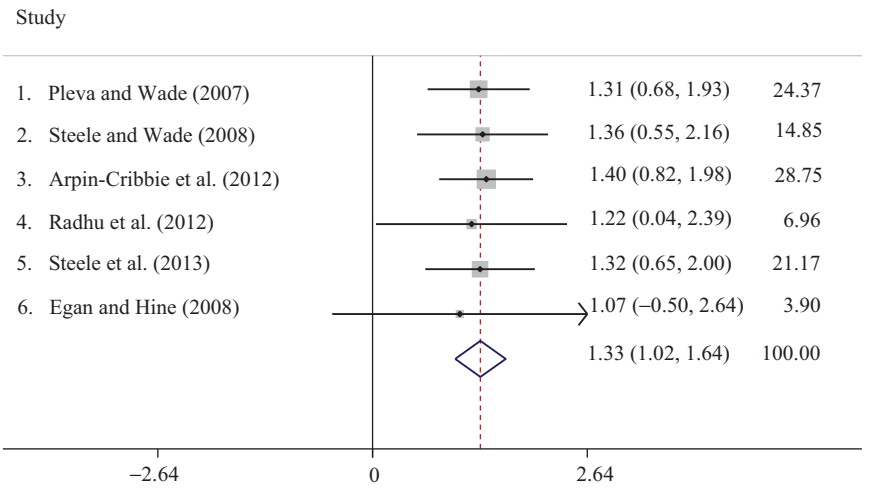

Figure 3. (Colour online) Forest plot for FMPS CM subscale: standardized effect sizes for change between pre and postintervention

Concern over Mistakes (CM). Six studies used this subscale of the FMPS (N = 100). The meta-analysis showed a pooled standardized mean difference between pre and postintervention of $g = 1.32$, a very large effect size (CIs = 1.02 – 1.64). Figure 3 shows the effect size of studies using the FMPS CM subscale and the pooled estimate.

Doubts about Actions (DA). Two studies used the FMPS DA subscale: Pleva and Wade (2007) found significant change during treatment, $p < .01$, $g = 0.61$, a medium effect size, whilst Radhu et al. (2012) did not observe any change over treatment (p not reported).

HMPS: Self Oriented Perfectionism (SOP). Four studies used the SOP subscale of the HMPS ($N = 55$). The meta-analysis showed a pooled standardized mean difference between pre and postintervention, g = 0.81 (CIs = 0.41 – 1.20), a large effect size. Figure 4 shows the effect size for each study and the pooled estimate.

H-MPS: Socially Prescribed Perfectionism. Four studies used the SPP subscale of the HMPS ($N = 55$). The meta-analysis showed a pooled standardized mean difference between pre and postintervention of $g = 0.52$ (0.13 – 0.90), a medium effect size. See Figure 5 for individual effect sizes and the pooled estimate.

CPQ. The CPQ was used in three studies. Glover, Brown, Fairburn and Shafran (2007) and Riley et al. (2007) reported significant differences in scores between pre and posttreatment ($p = .01$, $p < .01$ respectively), very large effect sizes ($g = 1.13$, 1.24). Steele et al. (2013) also reported significant change ($p = < .05$), a large effect size ($g = 0.90$).

PCI. Two studies (Arpin-Cribbie, Irvine and Ritvo, 2012; Radhu et al., 2012) used this measure, with significant change observed for both studies ($p = < .01$, $<.05$ respectively), large ($g = 1.01$) and very large ($g = 1.41$) effect sizes.

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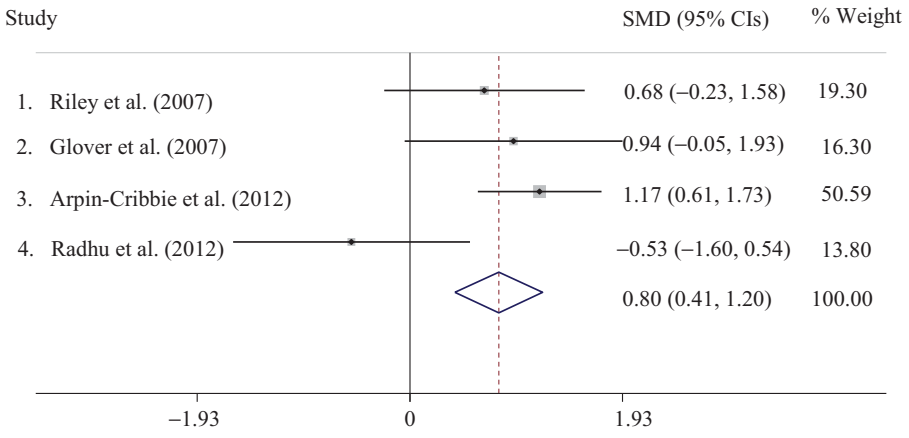

Figure 4. (Colour online) Forest plot for the HMPS SOP subscale: standardized effect sizes for change between pre and postintervention

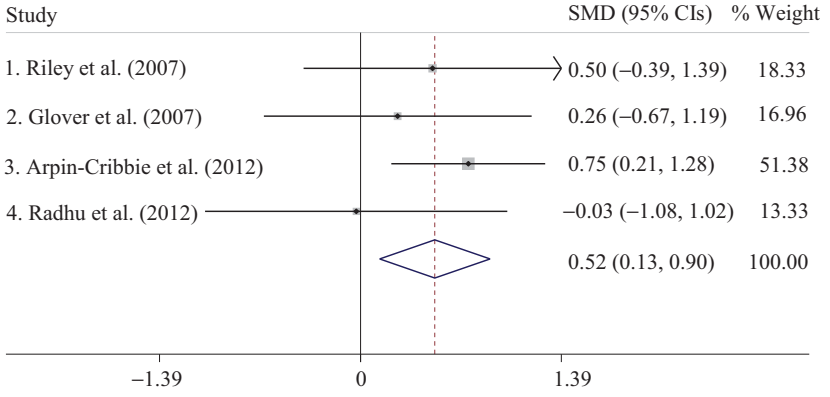

Figure 5. (Colour online) Forest plot for the HMPS SPP subscale: standardized effect sizes for change between pre and postintervention

APS-R: discrepancy. Two studies used this scale. Arpin-Cribbie et al. (2012) reported significant change between pre and posttreatment ($p = <.01$), a medium effect size ($g = 0.72$). However Radhu et al. (2012) found no significant change.

APS-R: High Standards. One study (Radhu et al., 2012) used this subscale and reported significant change between pre and posttreatment ($p = < .05$), a very large effect size ($g = 1.3$).

Anxiety

Seven studies reported changes in symptoms of anxiety ($N = 98$). The meta-analysis showed a pooled standardized mean difference between pre and postintervention of $g = 0.52$ (CIs

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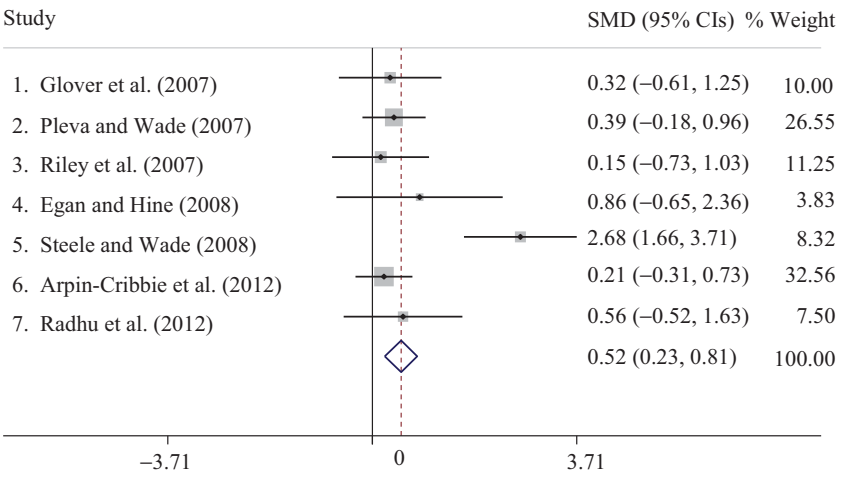

Figure 6. (Colour online) Forest plot for anxiety measures: standardized effect sizes for change between pre and postintervention

= 0.23 – 0.81), a medium effect size. Figure 6 shows the effect size for each study and the pooled estimate.

Depression

Seven studies reported changes in symptoms of depression ($N = 98$). The meta-analysis showed a pooled standardized mean difference between pre and postintervention of $g = 0.64$ (CIs = 0.35 – 0.92), a medium effect size. Figure 7 shows the effect size for each study and the pooled estimate.

One study (Steele et al., 2013) reported negative affect overall (anxiety, depression and stress measured by the DASS total score) and found significant change ($p = < .05$) between pre and postintervention, a large effect size ($d = 0.98$). Table 3 shows the effect sizes for each study reporting anxiety and depression scores.

Eating disorder symptoms

One study investigated changes in ED symptoms (Steele and Wade, 2008) and found significant changes at $p < .05$ for objectively reported episodes of bingeing ($g = 0.31$, small effect size), vomiting ($g = 0.48$, medium effect size) and concerns with shape and weight ($g = 3.83$, very large effect size). No difference was found between pre and postintervention for subjectively measured bingeing, laxative use or excessive exercise.

Obsessive compulsive symptoms

One study (Pleva and Wade, 2007) reported significant change ($p < .001$) of very large effect size on the MOCI ($g = 1.73$), PI-WSUR ($g = 1.90$) and RAS ($g = 1.77$).

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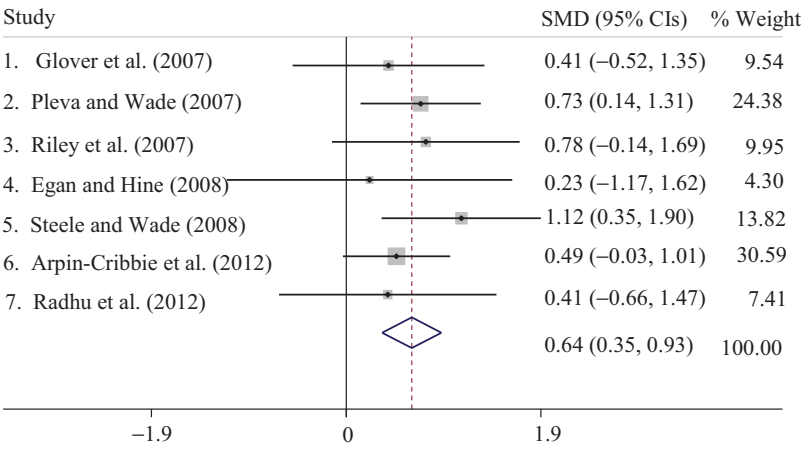

Figure 7. (Colour online) Forest plot for depression measures: standardized effect sizes for change between pre and postintervention

Discussion

The purpose of this systematic review and meta-analysis was to assess research evidence for interventions targeting perfectionism. There is support that it is possible to significantly reduce aspects of perfectionism using a cognitive behavioural approach with short interventions in adults with perfectionism as a primary problem or in addition to a psychiatric diagnosis. Meta-analyses demonstrated large pooled effect sizes for change between pre and postintervention on Personal Standards and Concern Over Mistakes subscales of the FMPS. Meta-analyses also found a large pooled effect size for the Self Oriented Perfectionism subscale of the HMPS and medium effect size for the Socially Prescribed Perfectionism subscale. Medium pooled effect sizes were found for changes in symptoms of anxiety and depression. Individual studies not included in the meta-analyses also reported significant change of medium effect size for eating disorder related measures and very large effect sizes for obsessive compulsive symptoms.

These findings are promising as perfectionism is found to impede treatment across a range of disorders. The efficacy of cognitive behavioural interventions in reducing perfectionism is in line with theory implicating biased cognitive processes in the development and maintenance of perfectionism. This review included studies involving participants with a range of psychiatric diagnoses, with evidence not only for reductions in perfectionism but also symptoms of anxiety, depression and EDs. These findings build upon evidence concerning the transdiagnostic nature of perfectionism (Egan et al., 2011) and support theory suggesting that targeting perfectionism may be effective in reducing symptoms across a range of disorders (Bieling et al., 2004; Shafran et al., 2002).

Observed changes in Self Oriented Perfectionism and Personal Standards reflect changes in aspects of perfectionism considered by some theorists as benign or adaptive. However, within a model of clinical perfectionism (Shafran et al., 2002) it is argued that positive achievement striving is toxic when combined with self-evaluation based upon the meeting

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of these standards. Therefore, in order to sustain clinically relevant changes in perfectionism, arguably both maladaptive evaluative concerns and positive achievement striving aspects of perfectionism need to be modified. This is particularly the case with individuals with ED symptoms, depression and anxiety where robust links with both aspects of perfectionism have been established.

Further research is needed to investigate the most effective format of perfectionism interventions, optimal dosage, and into specific disorders where there is currently a lack of evidence. Only one study included an ED sample and there are currently no published studies investigating interventions targeting perfectionism in Anorexia Nervosa (AN). Research in this area is needed given the implication of perfectionism in AN and its presence at elevated levels relative to other disorders (e.g. Egan et al., 2011). There may be important differences that need to be addressed in the treatment of perfectionism in EDs compared with other disorders.

Future research would benefit from inclusion of outcome measures assessing disability, handicap and distress associated with perfectionism. This would prove particularly useful in studies involving participants with different disorders, in order to allow comparison across disorders.

There are a number of limitations to this review. Differences between measures make it difficult to draw conclusions based upon available literature. There were also design features that were heterogeneous across studies and may account for differences in outcomes. Included studies varied in intervention format and dosage and although all studies involved a CBT based intervention, content varied. It is difficult to speculate why studies were associated with different effect sizes. For example, whilst it might be hypothesized that more intensive interventions – e.g. individual therapy versus self-help, or an increased number of sessions – would be associated with larger effect sizes, this was not the case. Differences in participants between studies are another potential confounding variable and it is possible that some disorders may be more amenable to change in perfectionism. Unfortunately, some studies with mixed samples gave limited details of numbers of participants with each diagnosis, making it difficult to draw conclusions regarding the generalizability of interventions. A further limitation is that some studies included participants with elevated perfectionism who were not patients and therefore self-selected to participate. This is a potential source of bias and confounding factor between those choosing to take part and those referred to studies. Those self-selecting may be hypothesized to have higher motivation to change. Motivation to change will be important to address in future studies and has been highlighted as being relevant to perfectionism (Egan, Piek, Dyck, Rees and Hagger, 2013).

Caution must be taken especially when interpreting the findings of the FMPS PS subscale and the HMPS SOP subscale given indications of heterogeneity between studies. The small sample sizes meant it was not possible to control for study differences using a random effects model, or to explicitly explore factors affecting outcome. The small number of studies included in the meta-analyses is a limitation of the study. This is a threat to validity and results should therefore be interpreted with caution.

However, this review provides initial evidence that a cognitive behavioural approach may be effective in reducing perfectionism in individuals with a psychiatric diagnosis or elevated of perfectionism. Given existing research demonstrating an association between perfectionism and poorer prognosis in several disorders, these findings have clear clinical implications.

However, further research is needed into specific disorders not yet investigated, including AN and BDD.

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