


Early maladaptive schemas in chronically depressed patients: A preliminary investigation

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Key words

chronic depression, depression, early maladaptive schemas, schema theory.

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Received 29 June 2017; accepted 20 February 2018.

doi:10.1111/cp.12151

Abstract

Background: Schema therapy has been proposed as a potentially effective treatment for chronic depression. However, little is known about early maladaptive schemas (EMSs), a key concept in schema therapy, in relation to chronic depression or chronic depression with comorbid personality pathology. The aim of the present study was to compare EMSs between currently chronically depressed patients with comorbid cluster C personality disorder (CD_{CPD}), currently chronically depressed patients (CD), and patients remitted from chronic depression (CD_R).

Methods: Based on data from a naturalistic follow-up study on psychiatric outpatients with major depressive disorder, three groups were formed according to Diagnostic and Statistical Manual of Mental Disorders-IV: CD_{CPD} ($n = 15$), CD ($n = 23$), and CD_R ($n = 13$). Groups were compared in terms of background information and measurements for depression (Beck Depression Inventory) and EMSs (Young Schema Questionnaire).

Results: Patients with CD_{CPD} and CD did not differ in terms of background variables or the severity of depressive symptoms, but patients with CD_{CPD} were more maladaptive with respect to the majority of EMSs. Patients with CD_R were less depressed than CD_{CPD} or CD patients, but did not differ in terms of EMSs compared with CD patients.

Conclusions: Comorbid cluster C personality disorder appears to be associated with more severe EMS endorsement in chronically depressed patients. Remitted patients show similar cognitive vulnerability factors in terms of EMSs compared to those currently chronically depressed. The findings suggest that EMSs may contribute to vulnerability to chronic depression. Focusing on EMSs may be beneficial in the treatment of chronic depression.

Key Points

1 Comorbid cluster C personality disorder is associated with elevated maladaptive cognitive schema endorsement in chronically depressed patients.

2 Patients with chronic depression in remission show similar early maladaptive schemas to those currently chronically depressed, indicating cognitive vulnerability to depression.

3 Addressing maladaptive cognitive schemas through psychotherapy may be beneficial in treating chronically depressed patients.

Funding: None.

Conflict of interest: None.

Background

Chronic depression is defined by depressive symptoms lasting for at least two years (Klein, 2008), and approximately one fifth of all depressed patients experience the chronic course of the disorder (Keller *et al.*, 1992). Chronic depression is associated with significant functional impairment (Klein & Santiago, 2003), a negative impact on quality of life (Wells, Burnam, Rogers, Hays, & Camp, 1992), and an economic burden (Stulz, Thase, Klein, Manber, & Crits-Christoph, 2010). Traditionally, four types of chronic depression have been distinguished in the literature: chronic major depressive disorder (MDD), dysthymic disorder, double depression (i.e., the co-occurrence of MDD and dysthymic disorder), and recurrent MDD without full recovery between episodes (Klein, 2010). These subtypes do not appear to represent aetiologically distinct disorders (Klein, Shankman, & Rose, 2006; McCullough *et al.*, 2003), and in the latest Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013), a single diagnostic category of persistent depressive disorder has replaced the DSM-IV categories of chronic MDD and dysthymic disorder.

Antidepressant medication and cognitive-behavioural therapies are typically used to treat chronic depression (Arnow & Constantino, 2003; Riso *et al.*, 2003; Steinert, Hofmann, Kruse, & Leichsenring, 2014; von Wolff, Hölzel, Westphal, Härter, & Kriston, 2013). Compared to episodic depression, chronic depression is more difficult to treat, and the initial remission is maintained only with extensive continuation and maintenance treatments (Renner, Arntz, Leeuw, & Huibers, 2013). Symptom-focused treatments may not appropriately address adverse childhood experiences and personality pathology, both of which are important distal risk factors for the persistence of depression (Renner *et al.*, 2013). Comorbid personality disorders, particularly borderline personality disorder and cluster C personality disorders, are common in chronic depression (Hayden & Klein, 2001; Klein & Santiago, 2003). In naturalistic longitudinal studies, comorbid cluster C personality disorder has been linked with poor treatment outcomes in chronic depression (Hayden & Klein, 2001; Klein *et al.*, 2006; Viinamäki *et al.*, 2003). Patients with chronic depression also report more adverse childhood experiences compared to those suffering episodic depression (Hayden & Klein, 2001; Wiersma *et al.*, 2009), and a history of childhood adversity has been shown to relate to lower responses to antidepressant medication (Klein *et al.*, 2009). To address these underlying vulnerability factors, schema therapy (Young, 1990; Young, Klosko, & Weishaar, 2003) has recently been proposed as a

potentially effective treatment for chronic depression (Malogiannis *et al.*, 2014; Renner *et al.*, 2013).

Schema therapy was originally developed to treat long-term psychological difficulties, particularly personality disorders (Young, 1990), and it is explicitly concerned with the development of current symptoms, rather than only the factors maintaining them (Rafaeli, Bernstein, & Young, 2011). The focus in therapy is to identify and alter trait-like, self-perpetuating cognitive patterns, early maladaptive schemas (EMSs), which lead to maladaptive coping behaviours such as avoidance, overcompensating, and surrendering. In the schema therapy framework, EMSs refer to the stable characteristics of a person that, together with coping styles and the current emotional state, activate continuously changing dominant states of mind, which are referred to as schema modes (Rafaeli *et al.*, 2011). According to Young *et al.* (2003), EMSs emerge from unmet basic needs and traumatic experiences during childhood, combined with an individual's emotional temperament. Eighteen EMSs have been defined, which are further categorised under five broader schema domains: disconnection and rejection, impaired autonomy and performance, impaired limits, other-directedness, and overvigilance and inhibition.

The schema model for chronic depression proposes EMSs as proximal cognitive risk factors, which mediate the effects of personality pathology and adverse life events on the persistence of depression and remain stable without appropriate intervention (Renner *et al.*, 2013). Specific, relatively stable EMSs characterise depression (Renner, Lobbestael, Peeters, Arntz, & Huibers, 2012; Wang, Halvorsen, Eisemann, & Waterloo, 2010) and differentiate the depressed from mentally healthy individuals (Halvorsen *et al.*, 2009; Riso *et al.*, 2006). The EMSs from the disconnection and rejection and impaired autonomy schema domains, in particular, have been associated with depression (Halvorsen *et al.*, 2009; Renner *et al.*, 2012). Although schema therapy is increasingly used to treat chronic depression (Malogiannis *et al.*, 2014; Renner, Arntz, Peeters, Lobbestael, & Huibers, 2016), the role of EMSs, specifically in chronic depression or chronic depression with comorbid personality pathology, has rarely been investigated. In one study, Riso *et al.* (2003) found that chronically depressed individuals show elevated EMS domain scores compared to non-chronically depressed persons, even after controlling for the concurrent severity of depressive symptoms and personality disorder symptoms. Other studies have associated cluster C personality features with greater maladaptive schema endorsement and poorer treatment outcomes in group therapy for panic disorder and agoraphobia (Carr & Francis, 2010;

Hoffart Lunding & Hoffart, 2016). To date, however, no study has specifically compared EMSs in chronically depressed individuals in relation to personality disorder or their remission status. Further knowledge of the associations between EMS, personality pathology, and chronic depression could offer valuable insights into cognitive aspects of chronic depression.

To elucidate the role of EMSs in chronic depression, the present study compared psychiatric outpatients with current chronic depression and comorbid cluster C personality disorder, current chronic depression and chronic depression in remission in terms of EMSs and schema domains. Based on the schema model for chronic depression, we hypothesised that (1) patients with comorbid personality disorder would be more maladaptive with regard to EMSs and schema domains compared to the other two groups, and that (2) patients with chronic depression in remission would show a similar schema structure to currently chronically depressed patients, indicating an underlying cognitive vulnerability to depression.

Methods

Participants and Procedure

This preliminary investigation was based on pre-existing data from a naturalistic follow-up study on Finnish psychiatric outpatients with MDD (aged 21–62 years) recruited from the Department of Psychiatry at Kuopio University Hospital. The study was carried out in 2011–2012. The recruitment setting was a university hospital tertiary care clinic, where participants received standard psychiatric outpatient care. The received care comprised treatment visits to both a physician (including evaluations for pharmaceutical therapy) and another health professional (psychiatric nurse, psychologist) who provided either supportive therapy or psychotherapy, based on consensus between the treating physician and the health professional assigned to treat the patient. The psychotherapy approaches utilised included psychodynamic psychotherapy and cognitive therapy, but no schema-focused approaches were used. The participants gave written informed consent before entering the study. The Research Ethics Committee of the Northern Savo Hospital District accepted the study protocol.

At baseline, the diagnosis of MDD was confirmed using the Structured Clinical Interview for DSM-IV (SCID-I) (First, Spitzer, Gibbon, & Williams, 1996). Patients suffering from epilepsy, bipolar disorder, psychotic disorder, and depression related to medical conditions or substance abuse were excluded from the study. Of the initial 99 patients (56.6% women; mean age 39.41 years; standard deviation (SD) 11.94), 78 participated in the follow-

up (mean duration between baseline and follow-up assessments was 8.40 months, SD 2.30). We observed no differences in gender ($p = .630$), marital status ($p = .594$), or severity of depression ($p = .585$) between participants of the present study phase and non-participants at baseline. However, participants were older than non-participants (mean age 40.53 years, SD 11.73 vs. 34.29 years, SD 12.20, $p = .034$).

On follow-up, the SCID-I was repeated, together with the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II) (First, Gibbon, Spitzer, Williams, & Benjamin, 1997). Diagnostic information on personality disorders was obtained on follow-up due to findings that concurrent categorical diagnoses for personality disorders may be affected by an acute depressive episode (Melartin, Haukka, Rytsälä, Jylhä, & Isometsä, 2010); Stuart, Simons, Thase, & Pilkonis, 1992). At baseline and on follow-up, the participants completed a background questionnaire, the Beck Depression Inventory (BDI-21) and were assessed using the Global Assessment of Functioning (GAF). On follow-up, the participants also completed a measurement for EMSs, the Young Schema Questionnaire short form-extended (YSQ-S2-extended).

Three groups were formed from the follow-up data based on the following criteria: (1) current chronic depression with an Axis II diagnosis of cluster C personality disorder (CD_{CPD} , $n = 15$); (2) current chronic depression without personality disorder (CD , $n = 23$); and (3) chronic depression in remission without personality disorder (CD_R , $n = 13$). Current chronic depression was defined as a current MDD episode lasting more than two years and/or dysthymic disorder according to SCID-I. Chronic depression in remission was defined as a previous MDD episode lasting more than two years and/or dysthymic disorder at the time of the baseline assessment and remission during the follow-up phase. Thus, patients with current non-chronic depression ($n = 8$), non-chronic depression in remission ($n = 17$), and chronic depression with other than cluster C personality disorder ($n = 2$) were excluded from the study. The CD_{CPD} group included a patient with comorbid social phobia and another with alcohol dependence. The CD group included patients with comorbid generalised anxiety disorder ($n = 1$), panic disorder ($n = 1$), obsessive-compulsive disorder ($n = 2$), and alcohol dependence ($n = 2$). In the CD_R group there were no comorbid Axis-I diagnoses.

Measures

All diagnostic interviews, the background questionnaire, and self-report instruments were in the Finnish

language. Trained mental health professionals conducted SCID-I (First et al., 1996) and SCID-II (First et al., 1997) diagnostic interviews. The SCID-I and SCID-II have been shown to be valid and reliable assessments of pathology (Lobbestael, Leurgans, & Arntz, 2011). At the time of the diagnostic interviews, mental health professionals rated the functioning of the participants using the GAF (American Psychiatric Association, 1994). The GAF is a numerical scale used to rate the social, occupational, and psychological functioning of an individual. Scores range from 100 (extremely high functioning) to 1 (severely impaired). The GAF has shown satisfactory reliability and can be used to measure changes at group level (Söderberg, Tungström, & Armelius, 2005).

Participants completed a background questionnaire that collected information on demographics (age, sex, marital status, illness history) and the use of antidepressant medications. The use of antidepressant medications was double-checked from the prescription documents the patients provided at the study visit. Information on the duration of treatment contact and number of treatment visits was obtained from patient records.

The severity of depression was assessed at baseline and on follow-up using the Finnish version of the BDI-21 (Beck, Steer, & Carbin, 1988; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), and scores were analysed as a continuous variable. The BDI-21 is a self-report instrument consisting of 21 questions that are rated on a scale of 0–3. Higher total scores indicate more severe depressive symptoms. Total scores of 0–9 indicate minimal depression, 10–18 mild depression, 19–29 moderate depression, and 30–63 severe depression. The Finnish version of the BDI-21 has been shown to be valid and reliable (Viinamäki et al., 2004). In the present study, the internal reliability (coefficient alpha) was .88 at baseline and .91 on follow-up. The YSQ-S2-extended (Saariaho, Saariaho, Karila, & Joukamaa, 2009) was used to assess the EMS domains. The YSQ-S2-extended measures 18 EMSs grouped under five schema domains: disconnection and rejection (includes five schemas), impaired autonomy and performance (four schemas), impaired limits (two schemas), other-directedness (three schemas), and overvigilance and inhibition (four schemas). The questionnaire contains 90 self-statements (five for each schema), which respondents are asked to rate on a Likert scale ranging from 1 (completely untrue of me) to 6 (describes me perfectly). Scores for each EMS subscale are based on the mean of the five schema statements, and schema domains are calculated as the total sum of the schema scores for each domain. The factor structure and reliability of the Finnish version of the YSQ-S2-extended have been established (Saariaho et al.,

2009). In the present study, the internal reliability (coefficient alpha) for the YSQ-S2-extended was .81.

Statistical Analysis

All statistical analyses were conducted using SPSS 24.0 for Windows. Differences between the three groups were examined using the χ^2 test and Freeman–Halton extension of Fisher’s exact test for categorical variables and one-way analysis of variance (ANOVA) for continuous variables. Post hoc Bonferroni corrections were used for pairwise comparisons when an overall difference was demonstrated in ANOVAs. Continuous variables were first screened for the assumptions of ANOVA. All variables were normally distributed according to visual inspection and Shapiro–Wilk tests. All variables apart from mean age and age at the time of the first depressive episode met the assumption of homogeneity of variance. Because the mean age and age at the time of the first depressive episode had a heterogeneous variance, the Welch statistic was used to determine significance. Effect sizes for continuous variables were calculated as ω^2 . The effect size was considered small if $\omega^2 = .01$, medium if $\omega^2 = .06$, and large if $\omega^2 = .14$ (Field, 2013). For categorical tests, effect sizes were calculated as Cramer’s V and interpreted for $df = 2$ as small if $V = .07$, medium if $V = .21$, and large if $V = .35$. For $df = 4$, effect sizes were considered small if $V = .05$, medium if $V = .15$, and large if $V = .25$.

Results

The demographic characteristics and clinical variables of patients with CD_{CPD} , CD, and CD_R are presented in Table 1. The patient groups did not differ in terms of age, gender, or marital status. The number of lifetime depressive episodes did not differ between the groups. The mean age at the first depressive episode was lower for the patients with CD_{CPD} ($M 20.4$, $SD 8.1$) than for those with CD ($M 29.4$, $SD 15.9$), and CD_R ($M 29.0$, $SD 14.3$), but the differences were not statistically significant. Nearly all of the patients with CD_{CPD} and CD had a comorbid current MDD episode and dysthymic disorder at the time of the follow-up assessment. The current treatment contact at the outpatient clinic was significantly longer for patients with CD_{CPD} than those with CD_R , but the mean number of monthly treatment visits during the treatment time did not differ between the groups. The use of antidepressant medication at the time of the baseline or follow-up assessment did not differ between the groups.

At the time of the baseline assessment, the groups did not differ in terms of the severity of depressive

Table 1 Demographic and clinical variables in current chronic depression with comorbid cluster C personality disorder (CD_{CPD}), current chronic depression (CD), and chronic depression in remission (CD_R)

	CD _{CPD} (<i>n</i> = 15)	CD (<i>n</i> = 23)	CD _R (<i>n</i> = 13)	Test statistics	Effect size	Contrast
Demographics						
Sex (% women)	60.0%	65.2%	38.5%	$\chi^2(2) = 2.51, p = .285$	$V = 0.222$	–
Mean age (SD) in years	46.1 (10.1)	41.0 (8.2)	37.2 (15.3)	$F(2, 48) = 2.44, p = .106$	$\omega^2 = 0.053$	–
Marital status (% of total)				$\chi^2(4) = 7.02, p = .135$	$V = 0.262$	–
Single	46.7%	39.1%	38.5%			–
Married	20%	52.2%	53.8%			–
Divorced	33.3%	8.7%	7.7%			–
Clinical characteristics						
Mean number of lifetime depressive episodes (SD)	2.7 (2.1)	2.8 (2.3)	2.3 (1.7)	$F(2, 48) = 0.27, p = .769$	$\omega^2 = -0.029$	–
Mean length of current treatment contact in months (SD)	53.5 (23.5)	40.1 (19.0)	30.3 (17.0)	$F(2, 48) = 4.72, p = .014$	$\omega^2 = 0.127$	CD _{CPD} > CD _R
Mean number of monthly treatment visits (SD)	2.17 (1.19)	1.95 (0.95)	1.86 (0.90)	$F(2, 48) = 0.37, p = .693$	$\omega^2 = -0.025$	–
Antidepressant medication baseline (% of total)	73.3%	87.0%	100%	Exact test, $p = .257$	$V = 0.224$	–
Antidepressant medication follow-up (% of total)	73.3%	82.6%	84.6%	Exact test, $p = .737$	$V = 0.117$	–
Mean age at first depressive episode (SD)	20.4 (8.1)	29.4 (15.9)	29.0 (14.3)	$F(2, 48) = 3.23, p = .056$	$\omega^2 = 0.080$	–
Current major depressive disorder (% of total)	93.3%	100%	–	–	–	–
Current dysthymic disorder (% of total)	100%	95.8%	–	–	–	–
Primary Axis-II diagnosis (% of total)						
Obsessive–compulsive personality disorder	60%	–	–	–	–	–
Avoidant personality disorder	40%	–	–	–	–	–
Mean BDI-21 (SD)	33.3 (9.7)	26.3 (11.0)	17.3 (7.8)	$F(2, 48) = 9.25, p < .001$	$\omega^2 = 0.244$	CD _{CPD} , CD > CD _R
Mean GAF (SD)	49.5 (7.3)	54.4 (7.3)	74.6 (11.7)	$F(2, 48) = 33.9, p < .001$	$\omega^2 = 0.563$	CD _{CPD} , CD < CD _R

BDI-21, 21-item Beck Depression Inventory; GAF, Global Assessment of Functioning; SD, standard deviation.

symptoms according to the BDI-21 ($F(2, 48) = 1.15, p = .325, \omega^2 = .006$) or in social, occupational, and psychological functioning according to the GAF ($F(2, 48) = 1.38, p = .261, \omega^2 = .015$). At baseline, the BDI means were 33.33 (SD 9.81), 28.75 (9.56), and 28.08 (11.76) and the GAF means were 45.67 (SD 6.10), 47.87 (4.35), and 48.92 (6.14) for CD_{CPD}, CD, and CD_R groups, respectively. At the time of the follow-up assessment, there were statistically significant and, in terms of effect sizes, large differences between the groups. Post hoc analysis demonstrated that patients with CD_R were less depressed and had higher GAF scores than those with CD_{CPD} or CD. The two currently depressed groups did not differ in terms of BDI-21 or GAF scores at the time of the follow-up.

EMS subscales and schema domains of patients with CD_{CPD}, CD, and CD_R are presented in Table 2. There were statistically significant and, in terms of effect sizes, medium to large differences between the groups in four of the five EMS domains and 12 of the 18 EMS

subscales. Patients with CD_{CPD} had higher scores than patients with CD or CD_R in the schema domains of disconnection and rejection, impaired autonomy and performance, impaired limits and overvigilance and inhibition. Although patients with CD_R were significantly less depressed than those with CD, there were no significant differences in EMS subscales or schema domains between the groups. Patients with CD_{CPD} had significantly higher scores with large effect sizes, compared to patients with CD or CD_R, in the EMS subscales of “defectiveness/shame” and “social isolation/alienation” from the disconnection and rejection domain, and “dependence/incompetence” and “failure” EMSs from the impaired autonomy and performance domain. Similarly, large significant differences were found in the EMSs “negativity/pessimism,” “emotional inhibition,” and “punitiveness” from the overvigilance and inhibition domain and the “subjugation” EMS from the other-directedness domain. Patients with CD_{CPD} showed higher scores with medium effect size, compared to the

Table 2 Early maladaptive schema subscales and schema domains (YSQ-S2-extended) in current chronic depression with comorbid cluster C personality disorder (CD_{CPD}), current chronic depression (CD), and chronic depression in remission (CD_R)

	CD _{CPD} (n = 15), Mean (SD)	CD (n = 23), Mean (SD)	CD _R (n = 13), Mean (SD)	Test statistics	Effect size	Contrast
Disconnection and rejection domain	20.61 (4.94)	14.80 (5.26)	12.82 (3.75)	$F(2, 48) = 10.37, p < .001$	$\omega^2 = 0.269$	CD _{CPD} > CD, CD _R
Abandonment/Instability	3.65 (1.45)	3.03 (1.48)	2.55 (0.97)	$F(2, 48) = 2.31, p = .111$	$\omega^2 = 0.049$	–
Mistrust/Abuse	3.68 (1.45)	2.62 (1.26)	2.45 (1.00)	$F(2, 48) = 4.27, p = .020$	$\omega^2 = 0.114$	CD _{CPD} > CD, CD _R
Emotional deprivation	4.49 (1.01)	3.43 (1.54)	3.08 (1.44)	$F(2, 48) = 4.21, p = .021$	$\omega^2 = 0.112$	CD _{CPD} > CD _R
Defectiveness/Shame	4.11 (1.54)	2.43 (1.16)	2.18 (1.08)	$F(2, 48) = 10.47, p < .001$	$\omega^2 = 0.271$	CD _{CPD} > CD, CD _R
Social isolation/Alienation	4.68 (1.00)	3.29 (1.50)	2.55 (0.96)	$F(2, 48) = 10.84, p < .001$	$\omega^2 = 0.278$	CD _{CPD} > CD, CD _R
Impaired autonomy and performance domain	12.97 (3.34)	9.87 (3.30)	8.94 (3.20)	$F(2, 46) = 6.1, p < .001$	$\omega^2 = 0.172$	CD _{CPD} > CD, CD _R
Dependence/Incompetence	3.45 (1.02)	2.46 (1.02)	2.05 (0.88)	$F(2, 46) = 6.27, p = .004$	$\omega^2 = 0.177$	CD _{CPD} > CD, CD _R
Vulnerability to harm or illness	3.24 (1.34)	2.56 (1.15)	2.42 (1.31)	$F(2, 47) = 1.86, p = .166$	$\omega^2 = 0.033$	–
Enmeshment/Underdeveloped self	2.00 (1.04)	2.01 (1.24)	1.78 (0.69)	$F(2, 48) = 0.22, p = .806$	$\omega^2 = -0.032$	–
Failure	4.28 (1.53)	2.78 (1.29)	2.69 (1.43)	$F(2, 48) = 6.40, p = .003$	$\omega^2 = 0.175$	CD _{CPD} > CD, CD _R
Impaired limits domain	5.43 (1.60)	4.28 (1.25)	4.12 (1.29)	$F(2, 47) = 4.09, p = .023$	$\omega^2 = 0.110$	CD _{CPD} > CD, CD _R
Entitlement/Grandiosity	2.27 (0.91)	1.86 (0.64)	1.72 (0.59)	$F(2, 48) = 2.29, p = .112$	$\omega^2 = 0.048$	–
Insufficient self-control/ self-discipline	3.16 (0.95)	2.40 (0.87)	2.40 (0.93)	$F(2, 47) = 3.66, p = .033$	$\omega^2 = 0.096$	CD _{CPD} > CD, CD _R
Other-directedness domain	10.56 (2.80)	9.12 (2.06)	9.18 (1.90)	$F(2, 48) = 2.07, p = .136$	$\omega^2 = 0.040$	–
Subjugation	3.45 (1.05)	2.00 (0.92)	2.03 (0.67)	$F(2, 48) = 13.48, p < .001$	$\omega^2 = 0.329$	CD _{CPD} > CD, CD _R
Self-sacrifice	3.53 (1.32)	4.02 (1.19)	3.45 (0.73)	$F(2, 48) = 1.37, p = .263$	$\omega^2 = 0.014$	–
Approval-seeking/Recognition-seeking	3.57 (1.32)	3.71 (1.27)	3.10 (0.82)	$F(2, 48) = 1.51, p = .231$	$\omega^2 = 0.020$	–
Overvigilance and inhibition domain	17.37 (3.60)	11.80 (3.97)	12.51 (3.21)	$F(2, 48) = 11.23, p < .001$	$\omega^2 = 0.286$	CD _{CPD} > CD, CD _R
Negativity/Pessimism	4.92 (0.92)	3.59 (1.24)	3.82 (1.14)	$F(2, 48) = 7.55, p = .001$	$\omega^2 = 0.204$	CD _{CPD} > CD, CD _R
Emotional inhibition	3.73 (1.79)	2.16 (1.12)	2.40 (0.87)	$F(2, 48) = 7.06, p = .002$	$\omega^2 = 0.192$	CD _{CPD} > CD, CD _R
Unrelenting standards/ Hypercriticalness	4.39 (1.16)	3.32 (1.44)	3.31 (1.08)	$F(2, 48) = 3.71, p = .032$	$\omega^2 = 0.096$	CD _{CPD} > CD, CD _R
Punitiveness	4.33 (1.12)	2.84 (1.25)	2.98 (1.42)	$F(2, 48) = 7.03, p = .002$	$\omega^2 = 0.191$	CD _{CPD} > CD, CD _R

Note: The cells vary slightly due to missing data. SD, standard deviation; YSQ-S2-extended, Young Schema Questionnaire short form-extended.

other two groups, in the EMSs “mistrust/abuse” from the disconnection and rejection domain, “insufficient self-control/self-discipline” from the impaired limits domain, and “unrelenting standards/hypercriticalness” from the overvigilance and inhibition domain. Patients with CD_{CPD} were more maladaptive with regard to the EMS “emotional deprivation” from the disconnection and rejection domain compared to patients with CD_R.

Discussion

The aim of the present study was to compare EMSs between chronically depressed patients with and without cluster C personality disorder and patients remitted from chronic depression. Consistent with our first hypothesis, comorbid cluster C personality disorder was associated with elevated EMS scores compared to the other two groups without personality disorder. Comorbid cluster C personality disorder was associated with higher maladaptive schema endorsement in at least one EMS subscale from all the EMS domains, and overall schema endorsement was higher in four of the five schema domains: (1) disconnection and rejection, (2) impaired autonomy, (3) impaired limits, and (4) overvigilance and

inhibition. Our second hypothesis, which stated that remitted patients would show underlying cognitive vulnerability to depression, was also supported. Even though patients with CD_R were significantly less depressed and had a higher degree of functioning, there were no differences in EMSs compared to patients with CD.

Young et al. (2003) propose that EMSs are particularly related to enduring psychological difficulties, and similar EMSs may contribute to different forms of long-term clinical psychopathology. Overall, we found that patients with CD_{CPD} endorse largely similar EMSs to those previously associated with depression (Halvorsen et al., 2009; Riso et al., 2003), with greater intensity than patients with CD or CD_R. EMSs differentiating patients with CD_{CPD} from the other two groups also include several themes that are consistent with clinical representation of cluster C personality disorders, in which anxiety dominates functioning (Arntz, 2012). According to the schema model, the disconnection and rejection domain deals with beliefs related to inadequate acceptance or security (Young et al., 2003). From this domain, patients with CD_{CPD} showed higher endorsement in the EMSs “defectiveness/shame,” which refers to feeling that one

is unwanted or inferior and “social isolation/alienation,” which is described as feeling that one is isolated from others (Young et al., 2003). Compared to the other two groups, patients with CD_{CPD} were also characterised by the “mistrust/abuse” EMS, which refers to beliefs that one will be hurt or humiliated by others, and showed higher endorsement of beliefs related to a lack of emotional support from others (“emotional deprivation” EMS) compared to patients with CD_R. The impaired autonomy and performance domain concerns beliefs related to an impaired ability to survive and cope (Young et al., 2003). From this domain the EMS subscales differentiating patients with CD_{CPD} from patients with CD and CD_R were “dependence/incompetence,” which refers to the belief that one is unable to handle responsibilities without considerable help from others, and “failure,” which concerns feelings of inadequacy and failure in personal life (Young et al., 2003). The impaired limits domain concerns difficulties in setting internal limits and long-term goals, and from this domain, CD_{CPD} patients endorsed the “insufficient self-control” EMS, which presents as discomfort-avoidance at the expense of personal fulfilment (Young et al., 2003). The overvigilance and inhibition domain overemphasises the suppression of one’s feelings (Young et al., 2003). Patients with CD_{CPD} showed uniformly higher endorsement in all the EMSs belonging to this domain, including views related to general pessimism about one’s life, excessive inhibition of feelings, and high internal standards. In addition, patients with CD_{CPD} were more maladaptive compared to the other two groups in the EMS “subjugation” from the other-directedness domain. Young et al. (2003) define the “subjugation” EMS as excessive surrendering of control to others to avoid anger, retaliation, or abandonment.

Schemas are thought to represent the deepest level of dysfunctional cognitions (Segal, 1988) and EMSs have demonstrated notable stability in depressed patients (Renner et al., 2012; Wang et al., 2010). Our findings are consistent with the schema model for chronic depression, which suggests that cluster C personality pathology is related to higher maladaptive cognitive schema endorsement (Renner et al., 2013). Similar findings have also been reported in non-clinical samples and patients with anxiety disorders (Carr & Francis, 2010; Hoffart Lunding & Hoffart, 2016). The schema domains of disconnection and rejection, impaired autonomy, and overvigilance have been previously shown to differentiate chronic depression from episodic depression, regardless of the severity of the depression or personality disorder symptoms (Riso et al., 2003). In Riso et al. (2003) study, personality disorder symptoms were assessed based on dimensional scores obtained from the

SCID-II on all DSM-IV personality disorders, rather than based on diagnostic categories as was done in the current study. Taken together, the findings point to the increasing severity of EMSs depending on persistence of depression and presence of personality pathology. The schema model for chronic depression suggests that recovery from depressive symptoms itself would not affect EMSs without specific schema intervention (Renner et al., 2013). We found similar EMSs in patients with CD and CD_R. Our findings highlight the possibility that EMSs may be an important part of cognitive vulnerability to chronic depression. Previously, similar results have been found in a mixed sample of previously and currently depressed subjects with a history of single-episode or recurrent MDD (Halvorsen et al., 2009).

According to the schema model, EMSs develop early in life as a combination of temperament and adverse life events and act as a proximal risk factor that mediates the effects of these on the persistence of depression (Renner et al., 2013; Young et al., 2003). Although no causal conclusions can be made based on the present study on the origins or development of EMSs in relation to chronic depression, there are several possible explanations for the results. The higher schema endorsement associated with cluster C personality disorders could be related to certain temperament characteristics, such as high harm avoidance, which has previously been associated with cluster C personality disorders (Svrakic, Whitehead, Przybeck, & Cloninger, 1993) as well as the severity of depression and EMSs (Halvorsen et al., 2009). A chronic course of depression has been shown to be associated with early-life adversities (Hayden & Klein, 2001; Wiersma et al., 2009), and one possible mechanisms by which adverse life events may affect depression in adulthood could be through the development of EMSs. This could, in particular, be the case with EMSs from the disconnection and rejection and the impaired autonomy and performance domains, which are most commonly associated with depression (Hawke & Provencher, 2011). According to Young et al. (2003), these EMSs develop in an early environment that is characterised as rejecting, detached, lonely, and undermining, and particularly themes from the disconnection and rejection domain are commonly observed in people with high psychological vulnerability.

There are a number of potential areas for future research. First, the role of disorders other than cluster C personality disorders in EMSs in chronic depression should be determined. Second, the basic concepts of schema therapy need to be studied with regard to chronic depression. Especially the theoretical mediating effect of early adversity or temperament characteristics on the development of EMSs and the influence on

chronic depression should be examined. Future studies should also focus on other dysfunctional cognitions and their relationship to EMSs in chronic depression in terms of the hierarchical model of generality (Segal, 1988). Cognitive factors, such as dysfunctional attitudes, and cognitive-behavioural and emotional avoidance differentiate chronic depression from episodic depression (Brockmeyer, Kulesa, Hautzinger, Bents, & Backenstrass, 2015; Riso et al., 2003), but there is still limited research on the possible interplay between the different cognitive aspects of chronic depression. There is preliminary evidence on the feasibility and acceptability of schema therapy for patients with chronic depression (Malogiannis et al., 2014; Renner et al., 2016), but no research demonstrating changes in EMSs during schema therapy for chronic depression. Given that the schema model emphasises altering EMSs as a key mechanism for change in therapy, the relief in EMSs should be expected as an outcome of treatment. A recent systematic review (Taylor, Bee, & Haddock, 2016) found that overall there is only limited evidence that EMSs change during schema therapy, as the majority of studies have not included assessment of EMSs as a treatment outcome. Furthermore, one study found that schema therapy results in similar symptomatic relief in MDD patients to that in traditional cognitive-behavioural therapy (Carter et al., 2013), and that other forms of psychotherapy might be beneficial in altering EMSs (Halford, Bernoth-Doolan, & Eadie, 2002; Wegener, Alfter, Geiser, Liedtke, & Conrad, 2013). Future randomised trials should include an assessment of EMSs to demonstrate whether schema changes occur during therapy, and whether the possibly observed changes are specific to schema therapy or result from the successful treatment of chronic depression.

This study has limitations that need to be addressed. Most importantly, the sample size was small; therefore, the results should be interpreted with caution and need to be replicated in larger samples. A larger sample size would have increased our statistical power and possibly allowed for more detailed analysis, such as controlling for the effects of the concurrent severity of depression or background variables on EMS endorsement across groups. Further research is particularly important from a clinical perspective, as this could lead to a more fine-grained understanding of the differences between the investigated groups and possibly help to improve clinical interventions through the recognition of specific EMSs that could be targeted in treatment. Although limited by the sample size, the design of the study offered a possibility to reliably compare chronically depressed and remitted patients and to exclude acute forms of depression. The assessment of personality disorders was also

conducted on follow-up, which should positively affect the diagnostic accuracy (Stuart et al., 1992). However, because the study sample was collected in 2011, the DSM-IV criterion was applied for all diagnoses. Several changes have been made to the diagnostic criteria for personality disorders in the DSM-5 (American Psychiatric Association, 2013), and future studies using DSM-5 criteria for personality disorders are needed. For instance, in DSM-5 strict stability criterion of personality pathology has been eliminated in order to better reflect the fluctuating nature of personality disorder symptoms over time (Porter & Rislser, 2014). Therefore, it is possible that diagnosis of comorbid personality pathology may differ in the case of chronic depression using DSM-5 compared to criteria used in the current study. In addition, research using the alternative DSM-5 trait model for personality disorders (American Psychiatric Association, 2013) is needed to explore how EMSs are related to personality traits in chronic depression with or without personality pathology. The current study did not include assessment of EMSs at baseline, and as this observational study was conducted in a naturalistic setting in a tertiary care university hospital setting, the participants were not allocated to specific psychotherapy groups. Therefore no conclusions can be drawn on possible changes in EMSs during outpatient care. The current study did not include comparisons with non-chronic depression or healthy controls, which would have further improved the interpretability of our findings. Nevertheless, the differences between depressed and healthy individuals, as well as non-chronic and chronic depression, have previously been well established.

In conclusion, comorbid cluster C personality disorder was associated with higher maladaptive schema endorsement than that of chronically depressed patients without personality disorder. Even though patients remitted from chronic depression were significantly less depressed and had a higher degree of functioning, they showed similar maladaptive schema endorsement to currently chronically depressed individuals, indicating underlying cognitive vulnerability to chronic depression. Future research is needed to replicate the findings in larger samples and to further explore the role and development of EMSs in chronic depression.

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