



Research paper

Associations between cognitive functioning, mood symptoms and coping styles in older age bipolar disorder



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ABSTRACT

Background: Older age patients with bipolar disorder (OABD) have often passive coping styles, generally considered as detrimental for functioning. The aim of the current study is to identify the contribution of cognitive functioning, subjective cognitive complaints and mood symptoms to passive and active coping styles in older age BD.

Methods: In 90 euthymic patients (age > 60) with BD I or II, we examined coping, neuropsychological profile including memory, attention, executive function and fluency, subjective cognitive complaints and mood symptoms.

Results: Better executive functioning and fewer depressive symptoms were associated with more active coping ($p = .02$ and $p = .001$ respectively). Associations between executive functioning and coping styles turned nonsignificant when combined with depressive symptoms in one model, indicating the importance of mood on coping styles. No associations were found between subjective cognitive complaints and coping styles.

Limitations: Cross-sectional data were used and no conclusions about causality can be made.

Conclusions: Even in euthymic patients, subclinical depressive symptoms may influence active coping negatively. Subjective cognitive complaints and objectified cognitive functioning seem to be of less importance for coping styles. Important implications are on the one hand optimizing treatment on reducing depressive symptoms and on the other hand focusing therapeutic interventions on coping in bipolar patients.

1. Introduction

Bipolar disorder (BD) is a highly disabling, chronic disorder that is characterized by both manic and depressive symptoms. In older age BD patients (OABD), coping with getting older, on top of coping with their chronic psychiatric disease, requires a broad spectrum of well-functioning, active coping styles (Grassi-oliveira et al., 2010; Ouweland et al., 2007). However, in line with earlier research, our previous study suggests OABD have a rather passive coping style (Schouws et al., 2015).

Coping can be described as a form of problem solving in which a person deals with, and tries to master demanding situations which he or she experiences as stressful (Innes and Kitto, 1989). Coping is thought of as a general disposition, research assumes coping styles to be relatively stable of the course of time and across different situations. Over the past few decades, research has classified coping in many different

dimensions, such as active versus passive, problem-focused versus emotion-focused and avoidance versus cognitive and behavioral coping styles. In general, active and problem-focused coping styles were considered more positive and helpful as compared to passive and emotion-focused coping styles (Blum et al., 2012). For patients, the coping styles that individuals use to deal with symptoms and consequences of chronic illness, can impact upon their psychological well-being (Felton and Revenson, 1984; Lam and Wong, 2005). Previous evidence in BD adults showed that relapse over an 18-month period depended upon how well patients coped with mania prodromes (Lam et al., 2001). Furthermore, the extent to which biological vulnerabilities are expressed in terms of mood dysregulation was shown to be influenced by maladaptive coping styles (Kuyken et al., 2007). This makes coping styles promising targets for psychological treatment, and insight in factors influencing coping of major importance.

We previously showed that personality is one important factor

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associated with coping (Schouws et al., 2015). We found the personality trait neuroticism to be associated to passive coping, whereas conscientiousness was associated to active coping. Another factor that is known to be associated to coping style is cognitive functioning (Hurt et al., 2012; Van den Bosch and Rombouts, 1997; Wilder-Willis et al., 2002). As OABD suffer from worse cognitive functioning as compared to elderly healthy controls (Schouws et al., 2016), cognitive impairment may be one of the more important factors associated with coping styles in this patient group. While in OABD research on coping styles is scarce, previous studies in patients suffering from schizophrenia, unipolar depression and Parkinson's disease suggest a relationship between worse cognitive functioning and less successful coping (Hurt et al., 2012; Van den Bosch and Rombouts, 1997; Wilder-Willis et al., 2002). As older adults also complain about declining cognitive abilities such as lower memory performance, it can be expected that these complaints trigger changes in coping styles. In mentally healthy elderly, both active coping styles (e.g. participate in memory training) (Ponds et al., 1997) as well as passive strategies (e.g. comparison with peers) (Heidrich and Ryff, 1993) are reported. Associations between subjective cognitive complaints and coping styles are also reported in other patient groups, although the direction of the association is still under debate: both positive (Van den Bosch and Rombouts, 1997), negative (Wells and Matthews, 1994) and indirect effects (Verhaeghen et al., 2000) of cognitive complaints on passive coping styles are found.

As coping styles in BD patients can influence the course of their illness and the mood dysregulations (Kuyken et al., 2007; Lam et al., 2001), optimizing them could be important targets in treatment. For example, in cognitive behavioral therapy, a range of approaches is typically used to increase the use of adaptive coping responses and decrease the use of those associated with poor outcome. However, for this to work, it must be clear which other factors are influencing coping, as this could impact treatment effects and could require different approaches for different subgroups of patients. However, in OABD, research on factors influencing coping is scarce. The current paper is the first to study in OABD whether cognitive functioning and subjective cognitive complaints are associated with both active and passive coping styles. As studies show mood to be of influence on coping too (Thomas et al., 2007), it is important to also take into account the effects of mood symptoms even though the current study included an euthymic sample. We hypothesize that lower cognitive functioning is associated with less active, and more passive coping styles. Further, we hypothesize that more cognitive complaints and mood symptoms are associated with more passive coping.

2. Methods

2.1. Study sample

The current study used the convenience samples of two studies. First, thirty-five patients that completed the follow-up assessment from our study on cognitive functioning in OABD were included (Schouws et al., 2016, 2009). These patients were recruited from outpatient clinics in four regions of the Netherlands, and from the Dutch Bipolar Patient Association (Schouws et al., 2009). Patients were excluded from the study if they were unable to communicate in Dutch or English, were suffering from mental retardation (IQ below 70), or had a primary diagnosis of alcohol dependence or substance abuse. Patients with a clinical diagnosis of dementia or a MMSE (The Mini Mental State Examination) score below 18 were also excluded from the study. Eligible subjects were reported to be clinically euthymic for at least three weeks by their psychiatrist. More detailed information about this patient group can be found elsewhere (Schouws et al., 2016, 2009). In addition, 55 patients from the dynamic cohort of the Dutch Older Bipolars study (DOBi) were included (Dols et al., 2014). For this study, patients were recruited by searching the computerized records of the Mental Health Organization (GGZ inGeest, Amsterdam, the Netherlands) and were

selected when they received treatment during the time between January 1, 2012 and December 31, 2013. Patients unable to communicate in Dutch or English, mental retardation (IQ below 70), poor cognition (Mini-Mental State Exam below 18), patients with a primary diagnosis of alcohol dependence or substance abuse, or a highly unstable psychiatric condition (e.g., current compulsory admission) were excluded. A detailed description of the selection of this patient group can be found elsewhere (Dols et al., 2014). While both participant samples of Schouws et al. and Dols et al. have been studied earlier, this particular convenience sample as a combination of the above mentioned two studies has not been used before. Thereby the current study performs more in depth investigation of the available data.

Together these cohorts led to a study sample of ninety euthymic BD type I and II patients for the present study. The studies were both approved by the Medical Ethics Committee of the VU University Medical Center, Amsterdam, the Netherlands. Written informed consent was obtained from all participants.

2.2. Mood and sociodemographic variables

Bipolar disorder was diagnosed with the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (First et al., 1996), or the Mini-International Neuropsychiatric Interview Plus (MINI) (Sheehan et al., 1998). Current mania symptoms with the Young Mania Rating Scale (YMRS) (Young et al., 2011). The YMRS is scored on a scale from 0 to 60, with scores ≥ 12 indicating clinically relevant (hypo) mania. Current symptoms of depression were measured by the Center for Epidemiologic Studies Depression Scale (CES-D; (Radloff, 1977)). The CES-D is a self-report scale, consisting of 20 items. It measures depressive symptoms during the previous week, with scores ranging from 0 to 60. Scores ≥ 16 indicate clinically relevant depression. Age and sex were obtained from medical files. Premorbid intelligence was estimated using the Dutch Reading Test for Adults (NLV), the Dutch version of the New Adult Reading Test (NART) (Nelson and O'Connell, 1978). The MMSE (Folstein et al., 1975) was used to provide an overall assessment of cognitive functioning. Current medication use and number of psychiatric hospitalizations were asked during the interview. Also, current alcohol intake was investigated during the interview.

2.3. Coping

The UCL (Schreurs et al., 1993) examined the participants' coping skills. The UCL consisted of 47 items, measuring 7 independent subscales. For the current study the subscales Active approach and Avoidance were used. Using factor analyses, the subscales Active approach and Avoidance were chosen to represent active and passive coping, as these showed the highest factor loadings (data not shown). The scores on the subscale Avoidance could theoretically range from 8 to 32, scores on the subscale Active approach ranged between 7 and 28.

2.4. Cognition

All subjects completed a comprehensive battery of neuropsychological tests grouped into four cognitive domains:

- Attention: Digit Span subtest of the Wechsler Adult Intelligence Scale (WAIS-III) (Wechsler, 1981), Trail Making Test–part A (Reitan and Wolfson, 2004), and The Amsterdam Short Term Memory Test (ASTM) (Schmand and Lindeboom, 2005).
- Learning and memory: The 10 Word Test [a modified version of the Auditory Verbal Learning Test] (Rey, 1964).
- Executive functioning: Trail Making Test–part B (Reitan and Wolfson, 2004), a modified version of the Stroop Color Word Test (Golden, 1978), and the Mazes (1–4) subtest of the Wechsler Intelligence Scale for Children (WISC) (Wechsler, 1976).

– Verbal fluency: Control Oral Word Association Test (COWAT) (Benton and Hamsher, 1976) and Animal and Occupation Naming subtest of the Groningen Intelligence Test (GIT) (Luteijn and van der Ploeg, 1983).

Subjective cognitive complaints were measured by the Cognitive Failures Questionnaire (CFQ) (Broadbent et al., 1982) which was composed of 25 questions measuring self-reported problems in memory, perception and motor skills. Scores could theoretically range between 25 and 125, but no normative values have been established for cut-off points to differentiate between many and few complaints.

2.5. Statistical analyses

Data was first examined to check whether they fulfilled the assumptions for parametric analyses. Composite scores for each neurocognitive domain were calculated by converting the subject's raw scores to standardized z-scores. These were then summed in each domain to provide a single score. A higher score indicated better neurocognitive performance.

Baseline sample characteristics were described as means and standard deviations, or percentages. To study associations of cognition and mood with active and passive coping separately, multiple linear regression analyses were performed. These analyses were adjusted for age, premorbid IQ and BD type. Cognitive functioning, subjective cognitive complaints and mood were entered into the regression analyses separately first, variables found to be significantly ($p < .05$) associated with coping in the previous analyses were combined into a final regression model. These analyses were repeated for passive coping as an outcome. Finally, it was briefly checked whether results were independent of alcohol use or psychiatric hospitalizations.

All analyses were conducted using SPSS version 22.0 (IBM Corp., Armonk, NY, USA). A p value of 0.05 was considered statistical significant.

3. Results

3.1. Descriptives

Sample characteristics can be found in Table 1. The mean age of the participants was 67.3 (SD = 5.4), and 55.6% was female. The premorbid IQ was shown to be above average, and the mean MMSE score indicated no cognitive decline (Table 1). Participants obtained a mean score of 60.7 (SD = 17.1) on the cognitive failures questionnaire, indicating many cognitive complaints (Schouws et al., 2012). The mean scores on the YRMS ($M = 0.64$, $SD = 1.6$) and CES-D ($M = 12.0$, $SD = 7.4$) reflected no clinically relevant manic and depressive symptoms. 64.4% of the patients was diagnosed with BD I. 65.1% of the patients was currently using lithium, while 26.7% of the patients (also) used another mood stabilizer. Number of psychiatric hospitalizations ranged between 0 and 17, with a median of 1 (IQR = 4), 27.1% of the patients had never been admitted to a psychiatric hospital. Results indicated that most of the patients either never consumed alcoholic beverages, or consumed alcoholic beverages more than half of the week. The mean number of drinks however was rather low (Table 1).

3.2. Predictors of active and passive coping

Table 2 shows the associations between cognitive functioning, mood symptoms and both active and passive coping adjusted for age, premorbid IQ and BD type (model 1). Significant associations were found between better executive functioning and more active coping, but no associations between subjective cognitive complaints and active coping were found. Depressive symptoms were associated with less active coping.

Combining the variables significantly associated with active coping

Table 1
Sample characteristics (N = 90).

Demographics	
Age (mean, sd)	67.3 (5.4)
Gender (% female)	55.6
Subjective cognitive complaints	60.7 (17.1)
Clinical characteristics	
Depression symptoms	12.0 (7.4)
Mania symptoms	0.64 (1.6)
BD type (% type I)	64.4
Medication use (%)	
Lithium	65.1
Other mood stabilizer	30.2
Number of psychiatric hospitalizations (median, IQR)	1 (4)
Alcohol use (%)	
Never	33.8
Monthly	7.4
2–3 times per week	13.2
≥ 4 times per week	45.6
Drinks/occasion (mean, sd)	1.52 (0.93)
Cognition (mean, sd)	
Memory	0.01 (0.81)
Attention	−0.02 (0.65)
Executive functioning	0.03 (0.76)
Fluency	0.003 (0.80)
MMSE	28.6 (1.3)
Premorbid IQ	112.0 (11.8)

^aComposite scores for each neurocognitive domain were calculated by converting the subject's raw scores to standardized z-scores. These were then summed in each domain to provide a single score. A higher score indicates better neurocognitive performance.

in a final model (model 2) showed executive functioning to no longer be significantly related to active coping. The association between depressive symptoms and active coping remained significant. For passive coping, no significant associations were found (Table 2).

Results showed that additional adjustment for alcohol use or psychiatric hospitalizations did not significantly changed the results (data not shown).

4. Discussion

The aim of this study was to examine the associations between cognitive functioning, subjective cognitive complaints, mood symptoms and both active and passive coping styles in older bipolar patients. We found better executive functioning and less depressive symptoms to be associated with more active coping. However, the association between executive functioning and coping styles became statistically non-significant after adding current depressive symptoms to the same model. This indicates that even in our euthymic sample, subclinical depressive symptoms are important in the association with an active coping style. No associations were found between cognitive functioning and mood, and passive coping style, and between subjective cognitive complaints and both coping styles.

As the current study is the first to examine associations between cognitive functioning, subjective cognitive complaints, mood symptoms and coping styles in OABD, results can only be compared with previous literature in other patient groups. Other studies in adult patients with schizophrenia or depression and older patients with Parkinson's disease found deficits in executive function and cognitive functioning in general to be associated with a less active coping style and greater use of passive coping styles, and better executive functioning to be associated to a more active coping style (Hurt et al., 2012; Van den Bosch and Rombouts, 1997; Wilder-Willis et al., 2002). However, previous studies did not correct for the effect of mood symptoms. Schizophrenia and Parkinson's disease are known to be associated with heightened depressive symptomatology (Pfeiffer, 2016; Uptegrove et al., 2017) and in depressive disorder subclinical symptoms are fairly common (Fava et al., 2007). Therefore it might be that part of the previous found

Table 2
Results of linear regression analysis predicting active coping and passive coping (N = 90).

	Active coping			Passive coping		
	B (SE)	95% CI	p-value	B (SE)	95% CI	p-value
Model 1^a						
Cognition						
Memory	0.49 (0.55)	−0.61; 1.95	.38	−0.22 (0.49)	−1.19; 0.75	.65
Attention	0.10 (0.74)	−1.39; 1.58	.90	−0.12 (0.70)	−1.52; 1.29	.87
Executive functioning	1.70 (0.68)	0.34; 3.06	.02	−0.28 (0.63)	−1.53; 0.96	.65
Fluency	0.36 (0.57)	−0.77; 1.49	.53	−0.15 (0.51)	−0.86; 1.16	.77
Subjective cognitive complaints	−0.02 (0.03)	−0.08; 0.04	.51	0.02 (0.03)	−0.04; 0.07	.56
Depression symptoms	−0.16 (0.05)	−0.27; −0.09	.003	0.04 (0.05)	−0.11; 0.15	.39
Mania symptoms	−0.10 (0.23)	−0.57; 0.37	.67	0.17 (0.21)	−0.24; 0.57	.42
Model 2^a						
Executive functioning	1.26 (0.71)	−0.16; 2.68	.08	–	–	–
Depression symptoms	−0.11 (0.06)	−0.22; −0.002	.04	–	–	–

Characteristics are entered into the regression analyses separately first (Model 1). Thereafter, variables found to be successfully contributing to active or passive coping at the previous analyses are entered in the multivariate model simultaneously (Model 2).

^a Corrected for age, premorbid IQ and BD type.

associations could be driven by mood symptoms. The current results indicate that in OABD, depressive symptoms are an important factor associated with coping styles, and that mood symptoms are more important than cognitive functioning for coping behaviour. This can be clinically relevant, and stresses the fact that even in euthymic patients attention is warranted for subclinical mood symptoms.

While the current study failed to find significant associations between cognition and coping strategies, earlier studies do suggest a role of cognitive function in specific real life and overall disability in adults with BD (Bowie et al., 2010; Nitzburg et al., 2016). Results show however the role of cognition to be rather modest and indirect. One study found cognitive functioning to be directly associated to household activities, and to be indirectly associated to work skills and interpersonal relationships via social and adaptive competence (Bowie et al., 2010). In another study, maladaptive coping styles and verbal learning, but no other cognitive functions, were associated to functional disability (Nitzburg et al., 2016). Both studies did confirm direct associations between depressive symptoms and specific and overall functional disability, also demonstrating the importance of mood for disability. This strengthens the message of the current study that therapeutic interventions should always take into account mood symptoms.

The strengths of this study were the inclusion of a relatively large group of patients, the careful selection of patients in a euthymic state, and the extensive neuropsychological test battery used. However, some limitations should also be noted. First, although the used coping questionnaire has good psychometrical characteristics, when using self-reported data there is always a risk of social desirable answers. Moreover, George et al. (2003) point out that BD patients normally tend to underestimate their pathology and the potential consequences of their illness (George et al., 2003). Second, we were unable to include a healthy control group, while comparisons between patients and healthy controls would have been clinically relevant. Third, the two UCL subscales that were included as active and passive coping styles were chosen by factor analyses, which has not been validated yet. A fourth limitation is the use of a convenience sample. One disadvantage of this particular convenience sample is that there is relatively more time between data collection and publication of the results. Finally, as we used a cross-sectional design, no conclusions about causality can be made. Prospective studies are needed to establish temporal relationships between cognitive functioning, mood and coping styles.

Overall, important implications from our study are on the one hand optimizing treatment on reducing depressive symptoms, as these symptoms might be easier overlooked in euthymic patients, and on the other hand focusing on therapeutic interventions for promoting active

coping by also taking mood into account. Our results can increase our understanding on how patients react and manage major events. Future longitudinal research is necessary to assess causal pathways between cognitive functioning and mood symptoms with coping. Also randomized controlled trials are needed to establish whether treatment options, for example cognitive behavioural therapy strategies, are really successful in adapting coping in OABD. When the complex interactions between cognitive functioning, mood and coping styles are well understood, care for bipolar disorder in older people can be improved to optimise their functioning and quality of life.

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Contributors

NP, SS and AD wrote the analysis plan. NP Managed literature searches, statistical analyses, wrote the first draft of the manuscript. All co-authors (AD, HC, MS and SS) contributed to the interpretation of the data and contributed to earlier and final drafts of the manuscript. All authors have approved the final article.

Conflict of interest

The authors of this paper do not have any commercial associations that might pose a conflict of interest in connections with this manuscript.

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Supplementary materials

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