
COPING MECHANISMS ASSOCIATED WITH COGNITIVE IMPAIRMENT IN MAJOR DEPRESSED PATIENTS

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Abstract

Background: Several reports have described impairment in certain neurocognitive domains for patients with depression. The results are conflicting therefore numerous studies are trying to understand the connection between depression, cognitive impairment and coping strategies.

Objective: The aim of the present study was to explore the dysfunctional coping styles in major depressed patients and the association between coping mechanisms and different cognitive domains.

Method: A cross-sectional study included 65 patients diagnosed with recurrent major depressive disorder who were evaluated clinically, neurocognitively. Cognitive functions were measured with neuropsychological tests, coping mechanisms were assessed with the Brief COPE and the severity of depression was evaluated with the HAM-D-17 items. All patients' results were compared with 35 healthy controls.

Results: Depressed patients in comparison with controls displayed significant statistical differences ($p < 0.05$) showing greater use of self-distraction, denial, disengagement and self-blame coping styles. Statistically significant associations ($p < 0.05$) were found between the cognitive domains verbal fluency, attention and information processing speed and the use of problemfocused and emotion-focused coping domains.

Conclusions: Coping mechanisms used by individuals to adapt may have a role in cognitive functioning and depression. As the results indicated, depressed patients used more dysfunctional coping styles than healthy subjects.

Keywords: Cognitive impairment, Major depressive disorder, Coping strategies

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Background

Over the last years reports concluded that cognitive impairment emerges during the depressive episode while other studies found cognitive deficits that persist despite clinical recovery (Burt et al., 1995; Chamberlain & Sahakian, 2004). In a review, McIntyre et al. (2013) showed that the most frequent complaints reported by depressed patients were problems with memory use, diminished concentration and inability to find words, slow thinking and difficulties in problem solving. Another study reported the impact of cognitive functions on the diagnosis and management of depression, emphasizing the importance of understanding the disturbances in the field of cognitive functioning (Conradi, 2010). Because of these results, researchers tried to explore the underlying mechanisms and found connections between cognitive functions, coping strategies and depressive symptoms, such as how different subdomains of executive functions could influence the relation between using specific coping styles and symptoms of depression (Hammar, 2009; Snyder, 2013).

Coping is defined as a process that an individual makes use of in order to manage emotions, behaviors, cognitions so that he could develop strategies and adapt to different sources of stress. It remains stable over the course of time and relatively the same in different kinds of situations (Compas et al., 2001; Innes & Kitto, 1989). Literature classified coping mechanisms in different dimensions such as: primary or secondary control engagement coping style that are more favorable for adapting; disengagement coping that implies withdrawing from the stressor with avoidance and denial; depressive coping style described as always being overwhelmed by problems and represents a risk for the recurrence of depression (Connor-Smith et al., 2000; Ormel et al., 2004). Other classifications described coping as: active or passive, more prevalent in older aged subjects, or emotion focused coping that is also used more by the elderly, problem focused and dysfunctional coping behaviors (Schouws et al., 2015; Helvik et al., 2016). The association between life events, environment stressors and the risk of developing depressive disorder it is well known, but these influences could be mediated by the coping strategies (Paans et al., 2018). A study done on soldiers returning from combat found that the use of avoidance coping style was related to an increased rate of depression (Bartone & Homish, 2020). Coping mechanisms and the risk of developing depression were studied in association with different somatic disorders, such as patients suffering of type 2 diabetes, who were

found using more emotion-focused coping mechanisms (Féki et al., 2019). Also, it was established that beliefs held by patients with multiple sclerosis about their illness are mediated through engagement in specific coping strategies (Bassi et al., 2019).

Several studies investigated the relationship between cognitive domains, coping and mental illnesses, and concluded that the relapse risk for depression could depend on how well patients cope with their cognitive deficiencies. (Lam et

al., 2001; Lam & Wong, 2005; Wilder-Willis et al., 2002). Moreover, research provided evidence that specific coping styles, such as avoidant coping, represent a risk factor for recurrence in major depression disorder, offering the explanation that coping could represent a premorbid vulnerability that makes patients prone for relapse (de Jonge et al., 2018). In the same context, reports showed that earlier recurrence of depression can be predicted on the basis of using more avoidant coping mechanisms, but not all the studies found relevant associations and some of the results were inconclusive (Holahan et al., 2005; Bockting et al., 2006; Bockting et al., 2007). On the other hand, a new form of psychotherapy is emerging, called open dialectical behavior therapy that aims to address rigid coping styles. Promising results showed improvement in cognitive flexibility, emotional processing and less avoidant coping style. It is important to recognize the maladaptive coping mechanisms and changing them could influence the course of depression (Suh et al., 2019; Lynch et al., 2020).

The objectives of the present study were to explore the dysfunctional coping styles in patients with major depression and the association between coping mechanisms and different cognitive domains, in order to increase the understanding of this relationship and to identify new potential intervention targets that may help patients to cope with symptoms and improve mental health status. People tend to develop coping methods as a part of an adaptation processes to the new situation of having depression and cognitive deficits, but not all are equally efficient and can make matters worse. For this reason, it may be important to identify what coping strategies associate with cognition in major depressed patients and correct them. We expect in depression the coping mechanisms to have an effect on the cognitive functioning and dysfunctional coping styles to be used more by depressed patients with a direct link on affective symptoms.

Methods

The present study is a cross-sectional one and included 65 patients presenting a major depressive episode. Patients were clinically and neurocognitively evaluated, and the coping mechanisms were tested during the acute depressive episode. The patients' group was compared to 35 healthy control subjects who met the same

exclusion criteria and matched by demographic characteristics. All individuals who were admitted in the study gave a written informed consent. „Iuliu Hatieganu” University of Medicine and Pharmacy Ethics Committee approved the study.

Participants

Information about demographic data, including age, gender and education level was collected through a clinical interview. The patients were of both genders,

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with ages between 18 and 60, and had also a minimum level of 8 years of education. First the patients were clinically assessed upon admission for a major depressive episode and the diagnosis was made according to DSM IV-TR and ICD10 diagnosis criteria for recurrent depressive disorder and major depressive episode. A HAM-D score over or equal 8 represented an additional inclusion criteria. Subjects were excluded if they met criteria for mental retardation, dementia, chronic alcoholism or any other substance dependence, history of head trauma, or any current medical condition which could interfere with the level of cognitive performances. All of the patients that were included in the study were hospitalized in an acute emergency ward, this is the reason why they presented with more severe symptoms and episodes in comparison with an outpatient population.

Instruments

The cognitive domains were assessed using two batteries of neuropsychological tests. First applied was the Brief Assessment of Cognition in Schizophrenia (BACS) that was initially developed by Keefe et al. for clinical trials in schizophrenic patients. The battery includes six subtests for evaluating different cognitive domains: working memory assessed by the Digit sequencing test, attention and processing speed assessed with the Symbol coding test, verbal fluency tested by Category instances test and Controlled oral word association test, executive functions evaluated with Tower of London (Roca et al., 2015). Secondly the Trail Making Test, that is part of a larger battery of neuropsychological tests, the Halstead-Reitan tests, was performed for evaluating attention and executive functions (TMT A, TMT B) (Clark et al., 2005).

The severity of depression was evaluated with the 17 items Hamilton scale which is one of the most widely used clinician-administered depression assessment scale. It was designed to measure the effectiveness of antidepressant medication in clinical trials and became the gold standard measurement for depression (Crasovan & Sava, 2013).

The coping mechanisms were tested with the Brief COPE scale, the shorter version of the COPE inventory, using 28 items in order to assess multiple coping

domains: emotion-focused domain (acceptance, emotional support, humor, positive reframing, and religion), problem-focused domain (active coping, instrumental support, and planning), and dysfunctional coping domain (behavioral disengagement, denial, self-distraction, self-blame and substance use) (Carver et al., 1989; Carver, 1997; Lyne & Roger, 2000; Crasovan & Sava, 2013).

Procedure of statistical analysis

In the first step of the analysis, data was descriptively assessed, based on frequencies and percents for the nominal variables and on the most important descriptive statistics for the numerical ones. Means, medians and standard deviations are provided for these variables through the article. In order to evaluate

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the relationship between cognitive performances and coping mechanisms, the correlation analysis was conducted (using the Pearson's correlation coefficient), for the depressed patients. The methodology applied for comparison purposes was established based on the results of the normality testing procedures. Firstly, scale variables were evaluate for normality. As in most of the cases, the groups of subjects turned out not to be normally distributed, nonparametric test was employed: the Mann-Whitney test for independent samples comparisons. Due to the fact that a minor part of the groups were normally distributed based on some variables, the ANOVA and the t-test were also applied. Results were the same.

Statistical significance was evaluated at the standard level of 5%. Statistical analysis was performed using IBM Statistical Package for Social Sciences 24 (SPSS) software, Windows version.

Results

Demographic and clinical characteristics of the patients and control group

Table 1. Demographic and clinical data of depressed group (n = 65) and control group (n = 35).

Demographic and clinical aspects	Depressed patients (n = 65) mean/SD	Normal controls (n = 35) mean/SD
Age (in years)	48.48 (SD = 10.484)	41.20 (SD = 11.063)
Sex - Male	n = 13 (20.00%)	n = 8 (22.9%)
Sex - Female	n = 52 (80.00%)	n = 27 (77.1%)
Level of education (years)	11.86 (SD = 3.115)	11.55 (SD = 2.708)
1. Gymnasium	n = 5 (7.7%)	n = 2 (5.7%)
2. Vocational school	n = 6 (9.2%)	n = 2 (5.7%)

3. High school	n = 34 (52.3%)	n = 13 (37.1%)
4. University education	n = 20 (30.8%)	n = 18 (51.4%)
HAM-D scores (depression)	23.20 (SD = 5.423)	–

Note: HAM-D Hamilton Depression Rating Scale, SD standard deviation

Depressed patients and the healthy control group were matched for all demographic items (gender, age, level of education), all this information is summarized in Table 1.

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Instrumental support	5.5538	1.54142	Pears. Correl.	-0.134	0.276	0.011	-0.012	0.178	0.226	0.177	0.064	
			Sig. (1-tailed)	0.143	0.013	0.467	0.463	0.077	0.035	0.079	0.306	
Disengagement	4.6462	1.31614	Pears. Correl.	-0.165	0.018	-0.045	0.010	-0.045	0.105	0.177	0.103	
			Cognitive function	Sig. (1-tailed)	0.094	0.445	0.362	0.470	0.362	0.202	0.080	0.207
			Pears. Correl.	0.190	0.025	-0.028	0.144	0.167	-0.116	0.020	-0.098	
			Sig. (1-tailed)	0.065	0.423	0.414	0.126	0.092	0.178	0.437	0.219	
			Pears. Correl.	-0.240	0.188	0.098	-0.105	-0.042	0.366	0.230	0.173	
			Sig. (1-tailed)	0.027	0.067	0.218	0.203	0.370	0.001	0.033	0.084	
			Pears. Correl.	-0.122	0.218	-0.007	-0.070	-0.002	0.217	0.172	0.144	
			Sig. (1-tailed)	0.167	0.040	0.478	0.290	0.492	0.041	0.086	0.126	
			Pearson Correl.	-0.114	-0.170	0.124	0.044	-0.029	0.108	0.015	-0.004	
			Sig. (1-tailed)	0.183	0.088	0.163	0.364	0.410	0.196	0.451	0.489	

Coping styles	Mean	SD	Statistic Test	Attention	Attention	Working	Ex.F TMT-B	Ex.F	Vb. Fluen.	Vb. Fluen.	Vb. Fluen.
				processing speed	processing speed	memory		Tower	Category instances	Contr. oral word assoc	Contr. oral word assoc
				TMT-A	coding	test		London	test	test-1 try	test-2 try

Venting	4.1538	1.58342	Pears. Correl.	-0.157	0.163	0.236	-0.260	-0.134	0.166	0.174	0.195	
			Sig. (1-tailed)	0.105	0.098	0.029	0.018	0.144	0.093	0.083	0.060	
Positive reframing	4.0462	1.33967	Pears. Correl.	-0.185	0.040	0.376	0.261	-0.063	-0.279	0.120	0.086	0.142
			Sig. (1-tailed)	0.070			0.018	0.310	0.012	0.171	0.248	0.129
Planning	5.3385	1.52353	Pears. Correl.	0.107	0.173	-0.106	0.066	0.057	-0.087	-0.129	-0.204	
			Sig. (1-tailed)	0.198	0.084	0.200	0.301	0.327	0.245	0.154	0.052	
Humor	3.4154	1.26110	Pears. Correl.	-0.099	-0.044	0.297	-0.134	0.002	0.020	0.125	0.146	
			Sig. (1-tailed)	0.217	0.365	0.008	0.144	0.495	0.436	0.160	0.123	
Self-blame	4.9692	1.56094	Pearson Correl.	-0.116	0.184	0.055	-0.129	-0.042	0.099	0.050	0.015	
			Sig. (1-tailed)	0.178	0.071	0.331	0.152	0.371	0.216	0.346	0.453	
Acceptance	4.4769	1.34754	Pears. Correl.	0.180	-0.117	-0.153	0.145	0.262	-0.176	-0.149	-0.149	
			Sig. (1-tailed)	0.076	0.177	0.112	0.125	0.018	0.081	0.118	0.118	
Religion	5.5692	1.53062	Pears. Correl.	0.100	0.265	0.014	-0.192	-0.047	0.002	0.069	0.069	
			Sig. (1-tailed)	0.213	0.017	0.455	0.062	0.355	0.493	0.292	0.292	

Note: SD standard deviation, Mean scores mean scores for each group, TMT- A Trail Making test A, TMT- B Trail Making test B, Ex. F. Executive Functions, Vb. Fluen. Verbal Fluency, Contr. Control.

During a depressive episode, correlations between cognitive performances and coping mechanisms, including emotion focused coping domain, problemfocused and dysfunctional coping domains, were obtained using Pearson correlation test. Results are presented in Table 2.

For attention and information processing speed statistically significant association ($p < 0.05$) was found. Trail making test A showed a negative association with active coping and emotional support. The symbol coding test was positive associated with religion mechanism, instrumental support and selfdistraction coping style.

Working memory, evaluated by the sequencing test, was the cognitive domain that showed significant statistical association ($p < 0.05$) with positive reframing, venting and humor coping styles. Pearson correlation coefficient = 0.297 for humor and Pearson correlation coefficient = 0.261 for positive reframing showed a positive association which demonstrated that patients who used more Emotion-focused coping mechanism had higher scores at the sequencing test.

Correlation analyses showed that for executive functions, assessed with Trail making test B, no statistically significant associations have been found with any of the coping styles evaluated. But, for the Tower of London cognitive test, negative Pearson correlation coefficients were found for active coping (Pearson correlation coefficient = -0.253) and positive reframing (Pearson correlation coefficient = -0.279), which demonstrated that patients with the minimum number of errors at Tower of London test had a greater use of functional coping styles.

Statistically significant associations ($p < 0.05$) were found between verbal fluency cognitive domain and emotional support, instrumental support and active coping behaviors. For all of these associations positive Pearson correlation coefficients were identified, that showed patients with better performance on semantic and phonemic fluency evaluation to have a greater use of problem focused and emotion focused coping domains. The only exception with significant results ($p < 0.05$) was for self-distraction coping style from the domain of dysfunctional coping.

Comparison of the descriptive statistics of coping mechanisms between depressed patients and controls

The majority of research found that specific types of coping are associated with depressive symptoms and because of this fact we have chosen to examine the dysfunctional coping domain between a group of depressed patients and healthy controls.

Table 3. Comparison of coping mechanisms between depressed patients and control group.

Coping mechanism	Group	Mean scores	Median	Std. dev.	Mann-Whitney U	Wilcoxon W	Z	Assumption Sig. (2-tailed)
Self-distraction	Patients	5.23	5	1.739	544.500	1174.500	-4.355	0.000

	Control	3.57	4	1.267				
	Patients	4.08	4	1.661				
Denial					850.000	1480.000	-2.129	0.033
	Control	3.34	3	1.349				
Substance use cope	Patients to Control	2.78	2 2	1.152				
		2.20		0.473	891.500	1521.500	-2.252	0.024
	Patients	3.83	4	1.645				
Disengagement					772.000	1402.000	-2.756	0.006
	Control	2.94	2	1.413				
	Patients	5.55	5	1.786				
Self-blame					718.500	1348.500	-3.105	0.002
	Control	4.46	4	1.197				

Note: Mean scores mean scores for each group, Median scores median scores for each group Std. dev standard deviation, Z Z test, Sig significance

The difference of coping strategies between depressed patients and healthy controls was obtained using Mann-Whitney test for independent groups.

Results displayed in Table 3 found significant statistical differences ($p < 0.05$) for all dysfunctional coping tests applied showing for depressed patients a greater use of self-distraction, denial, disengagement and self-blame. Descriptive analyzes presented that for the self-distraction, denial and self-blame coping domains depressive patients obtained higher mean scores, which decreased in healthy controls.

Discussions

The results obtained in our study showed statistically significant correlations between coping mechanisms and all of the cognitive domains evaluated, which included attention functioning, working memory, executive functions and verbal fluency. Our findings are supported by other results that have described the association between coping mechanisms and the role they play on cognitive performances (Hurt et al., 2012). Also, because recent research provided evidence that specific types of coping could represent risk factors for depression, we compared depressed patients with healthy subjects and obtained significant differences in the use of dysfunctional coping strategies (Bassi et al., 2019).

Emotion focused coping domain

Results found that emotion focused coping strategies presented stronger correlations with all of the cognitive functions tested and this aspect is supported by the findings of another study which suggested that depressive patients are more likely to adopt emotion-focused coping styles (Féki et al., 2019). Our results show that emotional support and positive reframing were the two coping mechanisms, from the

emotion focused coping strategies, identified as having significant associations with the good performance in attention, working memory, executive functions and verbal fluency assessment tests. Because of this aspect we can assume that these coping strategies could become a possible target intervention for determining better cognitive functioning. In a study conducted by Compas (2006), it was proposed to consider different cognitive domains as playing an important part in using multiple coping behaviors. These cognitive functions included working memory, cognitive flexibility, planning and having a proper inhibitory control; all of these findings support our results: that significant correlations are present between executive functions, working memory and emotion-focused coping mechanisms (Compas, 2006). Attention and information processing speed were the only cognitive domains positive associated with religion mechanism to cope. Our results are sustained by a Nigerian study which demonstrated that higher levels of religiosity were associated with functional coping styles (Amadi et al., 2015).

Dysfunctional coping domain

The results of our study show that from all the dysfunctional coping tests applied, only for self-distraction coping style was a statistically significant association ($p < 0.05$) identified with two cognitive domains, verbal fluency and attention processing speed. On the other hand, Campbell et al. (2008) found negative association between disengagement coping style and good performance on executive functioning tests. Moreover, another study showed that patients who use more disengagement coping behavior associate cognitive dysfunctions and more severe depressive symptoms (Arnett et al., 2002). Our results and the studies presented support the idea of recognizing the maladaptive coping strategies and try to change them in more adaptive and functional coping styles.

Problem-focused coping domain

Our results revealed that the greater use of problem-focused coping domain, represented by active coping style, was positively associated with better functioning on verbal fluency and executive functions. This primary control engagement coping strategy is more characteristic to males than females and is linked to a lower level of depressive symptoms and better adjustment to stressful situations (Compas et al., 2001). Instrumental support was the second coping mechanism from the problem-focused coping domain that was statistically significant associated with higher scores at evaluating attention and verbal fluency. From this point of view if depressive patients would response to the cognitive dysfunctions with a greater use of problem-focused coping mechanisms this could play a significant role in the course of depression and maybe also on the persistence of the cognitive impairment in the euthymic phase of recurrent depression. A possible explanation of contradictory results on the topic of coping mechanisms and their effect on cognitive functions and

depression could be explained by different cultural beliefs (Peyrot & McMurry, 1992).

Patients during depression phase displayed significant statistical differences ($p < 0.05$) in comparison with healthy subjects, using more dysfunctional copings strategies. A possible explanation for these results could be the fact that functional coping strategies that include active coping styles usually require a higher level of energy and depressed patients are feeling fatigue or with low level of energy as one of the core symptoms during the acute depressive episode. The same results were presented in a study that showed self-blame coping style to be positively associated with the severity of depression (Horwitz et al., 2011). Furthermore, another study showed that disengagement coping behavior could predict future suicidal ideation in depressed individuals, but not suicidal behavior and one reason for this aspect is that disengagement could be considered a passive form of coping that do not imply fulfilling the attempt (Horwitz et al., 2014).

Conclusions

Comparative analyzes for dysfunctional coping mechanisms showed statistically significant differences between depressed patients and healthy subjects, but no important differences between the phases of depression. Depressed patients showed greater use of self-distraction, denial, disengagement and self-blame, obtaining higher scores than controls. Patients who had better performance on semantic and phonemic fluency evaluation had a greater use of problem focused and emotion focused coping behaviors. Also, a greater use of emotion-focused coping mechanism revealed good performance on working memory cognitive domain.

Competing interests: I hereby declare that there are no potential conflicts of interest associated with this publication, and that any financial support has been noted in the Acknowledgment section.

Source of funding: The study was not sponsored.

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