

# Metacognitive and Meta-Emotional Styles in Patients With Alcohol and the Other Substance Dependence

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Received: November 4, 2014; Revised: December 17, 2014; Accepted: January 5, 2015

**Background:** Both alcohol and other substances are utilized for emotional and cognitive regulation.

**Objectives:** The purpose of the present study was to compare metacognitive styles and distress intolerance in patients with alcohol and other substance dependence.

**Patients and Methods:** According to DSM-IV TR criteria, 45 patients with alcohol dependence (AD), 44 patients with substance dependence (SD), and 43 volunteers without AD or SD (control group) were enrolled. Socio-demographic information form, Distress Tolerance Scale (DTS), and metacognitive questionnaire-30 (MCQ-30) were used to evaluate the participants.

**Results:** Patients with AD had significantly lower "tolerance" subscale and total DTS scores than those with SD and control group ( $P=0.008$  for SD sample and  $P=0.004$  for control group). Patients with SD had significantly higher scores in "appraisal" subscale DTS than control group ( $P=0.005$ ). Patients of both AD and SD groups had significantly higher scores in "positive beliefs" subscale of MCQ-30 than control group ( $P=0.012$  for AD group and  $P=0.001$  for SD group). There was no significant difference between AD and SD groups in any MCQ-30 subscale and total scores ( $P=0.440$ ).

**Conclusions:** Metacognitive regulation strategies are more considerable prediction than emotional regulation strategies in SD group than in AD group. Individuals with AD use alcohol as a means of both cognitive and emotional regulation strategy.

**Keywords:** Cognition; Emotions; Substance Dependence

## 1. Background

Self-reports and clinical observations suggest that alcohol affects emotion regulation. Many studies patients with alcohol dependence (AD) have comorbid psychiatric disorders, especially mood and anxiety disorders (1-3).

There are different studies about regulating emotions with alcohol (4-7). In addition to emotional regulation roles of substance and alcohol, Toneatto (8) reported that substances are used to regulate a wide range of cognitive events, especially unpleasant ones; thus, individuals use substance to regulate unpleasant cognitive events than pleasant ones. Although emotional and cognitive regulation has an important role in alcohol and substance dependence, there is a new issue regarding this phenomenon, i.e. metacognition.

Metacognitive theory and researches propose underlying mechanisms of psychological abnormalities and ways to treat these abnormalities (9-11). This theory suggests that psychological dysfunctions are due to some inappropriate thinking patterns, namely, worry and rumination (9-11). In addition, thinking patterns are attentional bias about threat-associated stimulus called threat monitoring. There are additional strategies to react to cogni-

tions, i.e., thought suppression and avoidance. All the strategies to deal with threat, self-discrepancies, and the emotion are called the cognitive attentional syndrome (CAS). These strategies constitutes increased amount of negative cognitions. When the components of the CAS are triggered by cognitive and emotional triggers, these strategies constitutes increased amount of negative cognitions (9). This process depends on dysfunctional metacognitions. Metacognition describes knowledge or belief about interpretation, monitoring and control of cognition. Metacognitions are also about internal feedback loops that cause persistent thinking process to achieve a goal (9, 12). There are two different content headline of metacognitive belief contributing to CAS, i.e. positive and negative metacognitive beliefs. Positive beliefs are about benefits of rumination, worry, threat monitoring, and avoidance. The negative beliefs have two broad sub-headings; one of them is uncontrollability of thoughts and the other is danger of thoughts (9).

Metacognitions are associated with depression (13), procrastination (14), obsessive-compulsive symptoms (15), perceived stress (16), hypochondriasis (17), pathologic post-

traumatic stress disorder (18), and test anxiety (19). Relatively new researches are about utilizing metacognitive theory in prediction and in determining the association between metacognitions and alcohol or substance use (20-23).

## 2. Objectives

In view of these findings, the purpose of the present study was to compare metacognitive styles and distress intolerance in patients with alcohol dependence (AD) and other substance dependence (SD). We also compared these individuals with healthy volunteers. We hypothesized that AD group had more distress intolerance levels and dysfunctional metacognitive styles than SD group and both of these groups had more distress intolerance and dysfunctional metacognitive styles than healthy volunteers.

## 3. Patients and Methods

### 3.1. Participants

A total of 99 patients including 45 with AD and 44 with SD, (diagnosed according to DSM IV-TR criteria,) who applied to Bakirkoy Mazhar Osman Psychiatry and Neurological Science Research and Training Hospital Addiction Outpatient Clinic were enrolled. The mean age was  $42.7 \pm 9.9$  years for AD group and  $26.6 \pm 4.4$  years for SD. The comparison sample comprised of 43 participants without AD and SD with the mean age of  $34.4 \pm 12.7$  years.

### 3.2. Measures

Socio-demographic information form, developed by our department for determining age, sex, education level, etc., was used to collect basic characteristics of the participants.

Metacognitions questionnaire-30 (MCQ-30) (24) measures different domains of metacognitions on five separate subscales and consists of 30 items. The five subscales are as follows: 1) Positive beliefs about repetitive thinking, e.g. "Worrying helps me cope"; 2) Negative beliefs about repetitive thinking concerning uncontrollability and danger, e.g. "When I start worrying, I can't stop"; 3) Low cognitive confidence, e.g. "I have a poor memory"; 4) Need to control thoughts, e.g. "I am weak because I can't control my thoughts"; 5) Cognitive self-consciousness, e.g. "I am conscious about the way that my mind works".

The MCQ-30 and its subscales have good to excellent internal consistency with Cronbach's alpha of 0.93 for total scores and 0.72 to 0.92 for subscales. The overall Kaiser-Meyer-Olkin (KMO) measure for MCQ-30 is 0.90 and the exploratory factor analysis supported a five-factor solution. These five-factors explain 68% of the variance. The MCQ-30 total scores have strong association with both pathologic worry

(Penn State Worry Questionnaire) and trait-anxiety (Trait Anxiety Inventory) with  $r = 0.54$  and  $r = 0.53$ , respectively ( $P < 0.0005$ ), and shows strong convergent validity (24).

Distress tolerance scale (DTS) (25) measures different domains of distress response on four separate subscales and consists of 15 items. The four subscales of DTS are as follows: 1) Tolerance, e.g. "It is impossible for me to be with my distressing thoughts"; 2) Appraisal, e.g., "Being distressed is unbearable for me"; 3) Absorption, e.g. "When I feel distressed I can't think anything except"; 4) Regulation, e.g. "There is nothing to do when I feel distressed". Higher scores indicate better distress tolerance. The DTS has high internal consistency (Cronbach's alpha, 0.89) and appropriate convergence with other self-report ratings of affective distress and regulation. The scale also has adequate test-retest reliability after six months (25).

### 3.3. Procedure

Ethics approval for the study was obtained from our hospital's ethical committee. A written informed consent form was taken from each participant. Participation in the research project was voluntary. Participants were given writing instructions for answering the questionnaires. Participants completed the socio-demographic information form, MCQ-30, and DTS once.

## 4. Results

There was no significant difference between three groups in MCQ-30 total scores. Regarding five dimensions of MCQ-30, individuals with AD and SD had significantly higher scores in the "positive beliefs" subscale than control group ( $U = 702.0$  and  $P = 0.012$  for AD group;  $U = 532.0$  and  $P = 0.001$ , for SD group). In "belief about need to control thoughts" subscale of MCQ-30, individuals with AD and SD had higher scores than control group; however, this difference was not statistically significant. We found no significant difference in other subscales of MCQ-30 (Table 1).

Kruskal-Wallis test was used to see whether there was a significant difference between three groups in DTS total scores ( $\chi^2 = 6.281$ ,  $P = 0.001$ ). Then Mann-Whitney U-tests were used to determine which group had significant difference with others. Regarding DTS total scores, individuals with SD and control group had significantly higher scores than individuals with AD ( $U = 667.5$  and  $P = 0.008$  for SD sample;  $U = 643.5$  and  $P = 0.004$  for control group). There was no significant difference between individuals with SD and control group in DTS total scores (Table 2).

Control and SD groups had significantly higher scores in the "tolerance" subscale of DTS than AD group ( $U = 583.5$  and  $P = 0.001$  for community sample;  $U = 649.5$  and  $P = 0.005$  for SD sample); SD group had significantly higher scores in the "appraisal" subscale of DTS than control group ( $U = 568.0$ ,  $P = 0.005$ ).

**Table 1.** Total and Subscale Scores of Metacognitive Questionnaire-30 of Alcohol Dependence Group, Substance Dependence Group, and Community Sample <sup>a</sup>

MCQ-30	No.	Mean of Ranks	Sum of Ranks	Mann-Whitney U	Z	P Value
<b>MCQ-30 Total scores</b>						
AD	45	48.24	2171.00	709.000	-1.922	0.065
CS	41	38.29	1570.00			
SD	43	46.03	1979.00	729.500	-1.361	0.173
CS	41	38.79	1590.00			
AD	45	46.56	2095.00	875.000	-0.773	0.440
SD	43	42.35	1821.00			
<b>Positive beliefs</b>						
AD	45	52.40	2358.00	702.000	-2.515	0.012
CS	45	38.60	1737.00			
SD	44	55.41	2438.00	532.000	-3.773	< 0.001
CS	45	34.82	1567.00			
AD	45	42.68	1920.50	885.500	-0.861	0.389
SD	44	47.38	2084.50			
<b>Cognitive confidence</b>						
AD	45	44.44	2000.00	965.000	-0.206	0.837
CS	44	45.57	2005.00			
SD	44	44.16	1943.00	953.000	-0.126	0.900
CS	44	44.84	1973.00			
AD	45	44.84	2018.00	983.000	-0.058	0.954
SD	44	45.56	1997.00			
<b>Uncontrollability danger</b>						
AD	45	47.58	2141.00	829.000	-1.160	0.246
CS	43	41.28	1775.00			
SD	44	42.63	1875.50	885.500	-0.517	0.605
CS	43	45.41	1952.50			
AD	45	49.50	2227.50	787.500	-1.667	0.095
SD	44	40.40	1777.50			
<b>Cognitive consciousness</b>						
AD	45	50.27	2262.00	798.000	-1.740	0.082
CS	45	40.73	1833.00			
SD	40	50.30	2010.50	959.500	-0.251	0.801
CS	44	35.41	1994.50			
AD	45	48.73	2193.00	822.000	-1.385	0.166
SD	44	41.18	1812.00			
<b>Need to control thoughts</b>						
AD	45	50.19	2258.50	756.500	-1.922	0.055
CS	44	39.69	1746.50			
SD	43	49.62	2133.50	704.500	-2.058	0.040
CS	44	38.51	1694.50			
AD	45	45.56	2050.00	920.000	-0.398	0.641
SD	43	43.40	1866.00			

<sup>a</sup> Abbreviation: AD, alcohol dependence; CS, community sample; MCQ-30, metacognitive questionnaire-30; and SD, substance dependence.

**Table 2.** Total and Subscale Scores of Distress Tolerance Scale in Alcohol Dependence Group, Substance Dependence Group, and Community Sample <sup>a</sup>

DTS	No.	Mean of Ranks	Sum of Ranks	Mann-Whitney U	Z	P Value
<b>Total scores</b>						
AD	45	35.97	1618.50	643.500	-2.854	0.004
CS	44	54.24	2386.50			
SD	44	44.52	1959.00	967.000	-0.008	0.993
CS	44	44.48	1957.00			
AD	45	37.83	1702.50	667.500	-2.648	0.008
SD	44	52.33	2302.50			
<b>Tolerance</b>						
AD	45	35.07	1618.50	583.500	-3.340	0.001
CS	44	54.24	2386.50			
SD	44	43.20	1901.00	911.000	-0.476	0.634
CS	44	45.80	2015.00			
AD	45	37.43	1684.50	649.500	-2.797	0.005
SD	44	52.74	2320.50			
<b>Regulation</b>						
AD	45	40.34	1815.50	780.500	1.883	0.060
CS	45	50.66	2279.50			
SD	44	44.39	1953.00	963.000	-0.223	0.823
CS	45	45.60	2052.00			
AD	45	40.72	1832.50	797.500	-1.588	0.112
SD	44	49.38	2172.50			
<b>Appraisal</b>						
AD	28	42.05	1177.50	460.500	-1.810	0.070
CS	44	32.97	1450.50			
SD	40	50.30	2012.00	568.000	-2.813	0.005
CS	44	35.41	1558.00			
AD	28	37.83	1702.50	512.000	-0.604	0.546
SD	40	52.33	2302.50			

<sup>a</sup> Abbreviation: DTS, distress tolerance scale; AD, alcohol dependence; SD, substance dependence; and CS, community sample.

## 5. Discussion

Our work was probably the first study that compared metacognitions and distress tolerance in patients with AD and other SD. Although some researches focused on metacognitions with problem drinking and substance use (8, 20-23), their samples consisted of participants with both AD and SD.

In the “positive beliefs” subscale of MCQ-30, results of present study showed that AD and SD groups had significantly higher scores than control group. Moreover, in “belief about need to control thoughts” subscale of MCQ-30, individuals with AD and SD had higher than scores than control group, with no significant difference. These findings are consistent with research results of Spada et al. (26) and Saed et al. (23). According to the metacognitive theory, individuals with addictive behaviors may worry or ruminate about triggers based on their positive metacognitive beliefs and this process leads to increased negative thoughts and emotions (9). These increased inter-

nal events can evoke the maladaptive coping behaviors such as suppression based on their existent beliefs about “need to control thoughts”. We know that positive metacognitive beliefs can affect drinking alcohol in order to regulate cognition and emotion (21). In our study, other subscales of MCQ-30 had no significant difference with previous researches. This inconsistency can be explained by our small sample size. Another possible explanation can be the existing psychologic disorders in our control group. As we know that dysfunctional metacognitive styles have been found to be related to psychologic disorders and our participants did not complete any scale to exclude other psychologic disorders (13-19, 27). Therefore, other psychologic disorders might have raised MCQ-30 subscales in controls.

We found no significant differences between individuals with AD and SD in metacognitive subscales. This finding shows that all of the patients with long-term alcohol

and substance use maintain higher metacognitive patterns such as “positive metacognitive beliefs” and did not have any healer effect on these beliefs.

In addition to researches on AD, we could not find any study focused on metacognitions in those with only SD. We hypothesized that in contrast to AD, individuals with SD have less distress intolerance than control group. Our results have shown that AD group had significantly lower scores in the DTS and “tolerance” subscale than SD group. “Tolerance” subscale of DTS focuses on individuals’ relation with distress and lower scores means intolerance of distress. According to our findings, we can conclude that individuals keep on alcohol use due to negative reinforcement. This is consistent with some researches that found associations between AD and emotional regulation (28, 29).

In contrast to AD, our results did not support the importance of emotion regulation processes in SD. It can be concluded that substance use may work through positive reinforcement rather than emotional regulation strategy as a negative reinforcement. Regarding our findings, we can suggest more focus on emotional acceptance interventions for AD and more focus on values and long-term goals-related interventions for SD during treatment process.

One limitation in our research was the small sample size for drawing certain conclusions. The lack of significant difference in MCQ-30 subscales between AD and SD groups may be about small size of our sample. Another one is about our study design. Because of descriptive and retrospective design, there is a need for longitudinal more valid trials to explore metacognitive processes of individuals with AD and SD. In addition, we did not include healthy volunteers to our study for examining the difference in psychologic disorders from healthy subjects. Lack of this data may be important for evaluations of our results.

Present study may suggest that in SD, cognitive regulation strategies are more common than emotional regulation strategies, which discriminates SD from AD. Individuals with AD use alcohol as a means of both cognitive and emotional regulation strategy.

## Authors’ Contributions

Okan Ufuk Ipek: Collection of data, analysis, interpretation of results, and writing the draft; Kaasim Fatih Yavuz and Sevinc Ulusoy: Research conception and design, revision of the manuscript, analysis, and interpretation of results; Oktay Sahin: Data collection of data; Erhan Kurt: Revision of the manuscript.

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