

## *Can Alexithymia and Metacognitions be Predictors of Treatment Approaches in Panic Disorder Patients?*

### *Panik Bozukluğu Hastalarında Aleksitimi ve Üstbilişler Tedavi Yaklaşımlarının Yordayıcıları Olabilir mi?*

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#### **Abstract**

**Objectives:** Alexithymia is characterized by difficulties in identifying and expressing emotions. Within the context of panic disorder, research suggests that individuals with alexithymia may be more susceptible to heightened anxiety and impaired emotional regulation. Metacognition, defined as the capacity to monitor and control one's own cognitive processes, plays a crucial role in emotional and psychological functioning. The present study aims to examine the differences in metacognitive beliefs between panic disorder patients with and without alexithymia and to investigate the predictive role of these beliefs in individuals with alexithymia.

**Materials and Methods:** This cross-sectional study included 61 individuals aged between 18 and 65 who were diagnosed with panic disorder. Participants were assessed using the Toronto Alexithymia Scale (TAS-20), the Metacognitions Questionnaire (MCQ-30), and the Panic and Agoraphobia Scale (PAS). A TAS-20 score of 61 or above was used as the cut-off point to identify the presence of alexithymia.

**Results:** A total of 61 patients were included in the study, comprising 14 men (23%) and 47 women (77%). Participants ranged in age from 18 to 65, with a median age of 40 years. Among the participants, 47.5% (n=29) of those with panic disorder were identified as having alexithymia. Statistical analyses revealed that, with the exception of the Panic Attack (PA), Cognitive Self-Consciousness (CS), and Externally Oriented Thinking (EOT) subscale scores, all other scale scores were significantly higher in panic disorder patients with alexithymia ( $p < 0.05$ ).

**Conclusion:** These findings indicate that a more comprehensive understanding of metacognitive theory, along with the implementation of metacognitive therapy, may provide significant therapeutic benefits for patients with panic disorder who also exhibit alexithymia.

**Keywords:** Panic disorder; alexithymia; metacognition

#### **Öz**

**Amaç:** Aleksitimi, duyguları tanımlama ve ifade etmede yaşanan zorluklarla karakterizedir. Panik bozukluk bağlamında, araştırmalar aleksitimik bireylerin artan kaygıya ve bozulmuş duygusal düzenlemeye daha yatkın olabileceğini düşündürmektedir. Kişinin kendi bilişsel süreçlerini izleme ve kontrol etme kapasitesi olarak tanımlanan üstbiliş, duygusal ve psikolojik işleyişte önemli bir rol oynamaktadır. Bu çalışmanın amacı, aleksitimi olan ve olmayan panik bozukluk hastaları arasındaki üstbilişsel inanç farklılıklarını incelemek ve aleksitimi olan bireylerde bu inançların yordayıcı rolünü araştırmaktır.

**Gereç ve Yöntemler:** Bu kesitsel çalışmaya yaşları 18 ile 65 arasında değişen ve panik bozukluğu tanısı almış 61 hasta katılmıştır. Katılımcılar Toronto Aleksitimi Ölçeği (TAS-20), Üstbilişler Anketi (MCQ-30) ve Panik ve Agorafobi Ölçeği (PAS) kullanılarak değerlendirilmiştir. TAS-20 skorunun 61 veya üzerinde olması aleksitimi varlığını belirlemek için kesme noktası olarak kullanılmıştır.

**Bulgular:** Çalışmaya 14 erkek (%23) ve 47 kadın (%77) olmak üzere toplam 61 hasta dahil edilmiştir. Katılımcıların yaşları 18 ile 65 arasında değişmekte olup ortalama yaş 40'tır. Katılımcılar arasında panik bozukluğu olanların %47,5'inde (n=29) aleksitimi olduğu tespit edilmiştir. İstatistiksel analizler, Panik Atak (PA), Bilişsel Özbilinç (CS) ve Dışa Yönelik Düşünme (EOT) alt ölçek puanları hariç, diğer tüm ölçek puanlarının aleksitimisi olan panik bozukluğu hastalarında anlamlı derecede yüksek olduğunu ortaya koymuştur ( $p < 0.05$ ).

**Sonuç:** Bu bulgular, üstbiliş kuramının daha derinlemesine anlaşılmasının ve üstbilişsel terapinin uygulanmasının, aleksitimisi olan panik bozukluğu hastalarının tedavisinde önemli terapötik faydalar sağlayabileceğini göstermektedir.

**Anahtar Kelimeler:** Panik bozukluk; aleksitimi; üstbiliş

## Introduction

Panic disorder (PD) is characterized by recurrent and unexpected panic attacks, accompanied by persistent concern about future attacks and their potential consequences (1). Panic disorder (PD) is associated with considerable personal distress, occupational impairment, and excessive utilization of medical services (2). Various theoretical models propose that PD arises from an interplay of biological, psychological, and environmental vulnerabilities, with particular emphasis on cognitive factors (3). However, current treatment approaches are not universally effective; relapse and the persistence of symptoms remain common challenges. Cognitive models, in particular, highlight the central role of maladaptive thought patterns and beliefs in the development and maintenance of PD (4).

It has been observed that cognitive factors alone are not sufficient to distinguish PD from other anxiety disorders (5). As a result, it is crucial for clinicians to consider additional therapeutic frameworks, such as Metacognitive Therapy (MCT) alongside Cognitive Behavioral Therapy (CBT), in the conceptualization and treatment of PD. Research indicates that both CBT and MCT yield long-term benefits for individuals with anxiety disorders. Notably, MCT may demonstrate greater effectiveness over time, potentially resulting in more stable and enduring improvements. Nonetheless, further research involving larger sample sizes is necessary to validate these findings (6).

The construct of alexithymia encompasses a cluster of symptoms, including difficulties in identifying and articulating subjective emotional experiences, a restricted imaginative capacity, and a marked focus on external events at the expense of internal mental processes (7).

Initially identified in psychosomatic patients, the concept of alexithymia has since evolved and extended beyond the psychosomatic context (8). Over the past five decades, researchers and clinicians have actively debated its conceptual nature—questioning whether alexithymia is unique to certain patient populations, whether it serves as a precursor to symptom development or constitutes a symptom itself, and whether it should be understood as primary or secondary, innate or acquired, a transient state or enduring trait, a defense mechanism, or a structural deficit (9). Alexithymia, as a distinct personality trait, is now understood to involve disruptions in cognitive-emotional processing and affect regulation (10). While the precise definition of alexithymia aligns more closely with a form of anomia than agnosia, for many clinicians and researchers, particularly those influenced by the work of Sifneos and Nemiah, it represents a multifaceted construct that goes beyond mere difficulty in verbalizing emotional states. Rather, it refers to the use of words that lack emotional significance. Alexithymia is also viewed as a significant defense mechanism against uncomfortable emotions, as well as a limitation in the capacity for emotional mental representation (11). Although alexithymia is not formally recognized as a clinical diagnosis in the Diagnostic and Statistical Manual of Mental Disorders (DSM) or the International Classification of Diseases (ICD), it is estimated to affect approximately 10% of the general population (12).

Metacognition encompasses a broad array of cognitive functions, including the ability to reflect on one's own thinking, recognize emotions, thoughts, and goals, and integrate these elements into coherent representations. As a result, individuals with well-developed metacognitive skills are able to address psychological and social challenges with greater efficiency and accuracy (13). An expanding body of literature suggests that metacognitive models play a significant role in understanding psychological vulnerability (14).

One of the most influential metacognitive models is the Self-Regulatory Executive Function (S-REF) model (15). This model was developed to address generalized anxiety disorder (GAD), panic disorder (PD), obsessive-compulsive disorder (OCD), and social anxiety disorder (SAD) (16). The S-REF model outlines the concept of cognitive-attentional syndrome (CAS), which includes the activation of dysfunctional beliefs, increased self-focused attention, threat monitoring, and ruminative processing (15).

To date, five key areas of metacognitive beliefs have been extensively explored in studies of mental disorders: (1) positive metacognitive views about worry; (2) negative beliefs about uncontrollability and risk; (3) positive beliefs about anxiety; (4) beliefs regarding the necessity of exerting control over one's thoughts; and (5) cognitive self-assurance and self-consciousness (17). According to the S-REF model, negative metacognitive beliefs play a crucial role in maintaining the cognitive-attentional syndrome (CAS). This connection, which involves the loss of mental control due to the misinterpretation of threatening mental events, has a significantly detrimental impact on mental well-being (18).

Grounded in the perspective that cognitive factors alone are insufficient to distinguish PD from other anxiety disorders, the present study aimed to examine differences in metacognitive beliefs between individuals with PD with and without alexithymia and to explore the extent to which these beliefs predict alexithymic traits among those who exhibit such characteristics.

## **Materials and Methods**

### **Subjects and Study Design**

Our target population consisted of outpatients diagnosed with PD. A sequential sampling method was employed by enrolling patients in the order they arrived for mental evaluation. Inclusion criteria were: ages 18 to 65, both genders, and the ability to complete the surveys independently. Exclusion criteria included the presence of additional somatic or mental health conditions. As a result, the study sample comprised 61 patients diagnosed with PD. A qualified psychiatrist, during a clinical interview, diagnosed the patients according to the ICD-10 criteria, which was further validated using the Panic Disorder Severity Scale (PDSS) for PD patients. The same psychiatrist administered the PDSS. Both the clinical interview and a self-report questionnaire developed specifically for this study were used to screen participants for exclusion criteria, including comorbidities. Prior to enrollment, a power analysis was conducted. Expected TAS-20 values were drawn from the study by Cucchi et al. (19), with the significance level set at  $p < 0.05$ , the required power at 80%, and the minimal detectable difference set to match the findings of the referenced study. The TAS-20 scale required the largest sample size,  $n = 60$ .

The participants were assessed using the Toronto Alexithymia Scale (TAS-20), the Metacognition Questionnaire (MCQ-30), and the Panic and Agoraphobia Scale (PAS). This cross-sectional study was conducted at the Faculty of Medicine, Bandırma Onyedi Eylül University. Ethical approval for this study was obtained from the Bandırma Onyedi Eylül University Health Sciences Non-Interventional Research Ethics Committee on 14.03.2023 under decision number 2023/45. Written informed consent was obtained from each participant, and their identities were kept confidential through the use of a coding system. Completed questionnaires and signed informed consent forms were stored separately. The study's goals and purpose were explained to participants in the informed consent form. The research adhered to the principles set forth in the 2013 Declaration of Helsinki by the World Medical Association (20).

## **Measures**

### **Panic and Agoraphobia Scale (PAS)**

The Panic and Agoraphobia Scale (PAS) is used to assess the severity of panic disorder in patients, considering factors such as panic attacks, disability, anticipatory anxiety, agoraphobic avoidance, and health concerns.

The scale evaluates the characteristics of panic attacks (PA), agoraphobic avoidance (AA), anticipatory anxiety (AA<sup>2</sup>), disability (D), and health concerns (HC). The scale was originally developed by Bandelow (1999) (21). Turkish adaptation of the scale was conducted by Tural et al. (2000) and the Cronbach's alpha coefficients for the Turkish version were reported to range between 0.86 and 0.88. (22).

### **Metacognition Questionnaire (MCQ-30)**

The Metacognition Questionnaire (MCQ), developed by Cartwright-Hatton and Wells, consists of five conceptually distinct but interrelated factors. These factors are: Positive Beliefs about Worry (PBAW), Cognitive Confidence (CC), Negative Beliefs about Uncontrollability and the Danger of Worry (NBAU), Cognitive Self-Consciousness (CS), and the Need to Control Thoughts (NCT) (23). The reliability of the Metacognition Questionnaire (MCQ) was supported by a Cronbach's alpha coefficient of 0.86, as reported in the Turkish adaptation by Tosun and Irak (2008) (24).

### **Toronto Alexithymia Scale (TAS-20)**

The Toronto Alexithymia Scale (TAS-20) is a Likert-type self-report scale consisting of twenty items, scored on a range from 1 to 5, used to assess alexithymia, defined as the inability to identify one's own emotions. A score of 61 or higher on the TAS-20 are considered to be within the alexithymia range (25). The scale includes three subscales: difficulty identifying feelings (DIF), difficulty describing feelings (DDF), and externally oriented thinking (EOT). Higher scores on the scale indicate higher levels of alexithymia (26). The Turkish adaptation, validity, and reliability of the TAS-20 were established by Güleç et al. (2009) and the Cronbach's alpha coefficient for the total TAS-20 scale was reported as 0.78. For the three subscales—Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), and Externally Oriented Thinking (EOT)—the coefficients were 0.80, 0.57, and 0.63, respectively (27).

## **Statistical Analyses**

The data collected for the study were analyzed using the Statistical Package for the Social Sciences (SPSS) version 29.0 for macOS, developed by IBM Corp, Armonk, NY. Frequencies and percentages were reported for categorical data, while descriptive statistics such as median, minimum, and maximum values were provided for continuous data. The "Chi-Square or Fisher's Exact Test" was used to compare categorical variables, while the "Mann-Whitney U-Test" was employed for group comparisons. To assess the relationship between continuous variables, "Spearman's Correlation Analysis" was performed. A p-value of less than 0.05 was considered statistically significant.

**Results**

A total of 61 patients, consisting of 14 men (23%) and 47 women (77%), were included in the study. The participants' ages ranged from 18 to 65, with a median age of 40. Of the panic disorder patients, 29 (47.5%) were diagnosed with alexithymia.

Table 1 presents the distribution of clinical and demographic characteristics based on the presence of alexithymia. Upon reviewing the table, it was found that there were no statistically significant differences between the groups in terms of demographic and clinical variables.

**Table 1:** Distribution of Demographic and Clinical Characteristics According to Toronto Alexithymia Scores

Variables	Total (N=61)	Non-Alexithymic (n=32)	Alexithymic (n=29)	p-value
	n (%) Median (Min-Max)	n (%) Median (Min-Max)	n (%) Median (Min-Max)	
<b>Age (years)</b>	40 (18-65)	40 (20-65)	38 (18-65)	0.925
<b>Gender</b>				0.481
Woman	47 (77)	23 (71.9)	24 (82.8)	
Male	14 (23)	9 (28.1)	5 (17.2)	
<b>Marital Status</b>				0.818
Single	23 (37.7)	13 (40.6)	10 (34.5)	
Married	38 (62.3)	19 (59.4)	19 (65.5)	
<b>Educational Background</b>				0.276
Primary Education	24 (39.3)	10 (31.3)	14 (48.3)	
High School	19 (31.1)	10 (31.3)	9 (31)	
University and Above	18 (29.5)	12 (37.5)	6 (20.7)	
<b>Working Status</b>				0.161
Not Working	42 (68.9)	19 (59.4)	23 (79.3)	
Working	19 (31.1)	13 (40.6)	6 (20.7)	
<b>People Living with</b>				0.118
With family	54 (88.5)	26 (81.3)	28 (96.6)	
With friend(s)	3 (4.9)	2 (6.3)	1 (3.4)	
Alone	4 (6.6)	4 (12.5)	0 (0)	
<b>Physical Illness</b>				1.000
Yes	24 (39.3)	13 (40.6)	11 (37.9)	
No	37 (60.7)	19 (59.4)	18 (62.1)	
<b>Known Physical Illness</b>	24 (39.3)	13 (40.6)	11 (37.9)	1.000
Cardiac	6 (25)	4 (30.8)	2 (18.2)	
Respiratory	4 (16.7)	2 (15.4)	2 (18.2)	
Others	14 (58.3)	7 (53.8)	7 (63.6)	
<b>Diagnosis of Panic Disorder in a First-Degree Relative</b>	18 (29.5)	10 (31.3)	8 (27.6)	0.974

Table 2 presents the distribution of scale scores based on the presence of alexithymia in patients. Upon reviewing the table, a statistically significant difference was observed between the groups in all scale scores, except for the Panic Attack (PA), Cognitive Self-Consciousness (CS), and Externally Oriented Thinking (EOT) scores ( $p < 0.05$ ). Patients with alexithymia exhibited higher scale scores compared to those without alexithymia.

**Table 2:** Distribution of Metacognition Questionnaire (MCQ-30), Panic and Agoraphobia Scale (PAS) Total and Subscale Scores According to Toronto Alexithymia Scores (TAS-20)

Total and Subscale Scores	Total (N=61)	Non-Alexithymic Patients (n=32)	Alexithymic Patients (n=29)	p-value
	n (%) Median (Min-Max)	n (%) Median (Min-Max)	n (%) Median (Min-Max)	
PA	7 (1-13)	7 (1-11)	8 (5-13)	0.055
AA	6 (0-11)	3 (0-11)	7 (0-10)	0.036
AA <sup>2</sup>	5 (0-8)	5 (0-8)	6 (4-8)	0.005
D	6 (0-11)	5.5 (0-11)	7 (0-11)	0.002
HC	4 (0-8)	3 (0-8)	5 (0-8)	0.014
PAS (Total)	30 (1-48)	22 (1-48)	33 (18-47)	<0.001
PBAW	11 (5-23)	9.5 (6-19)	13 (5-23)	0.021
NBAU	18 (9-24)	15.5 (9-24)	20 (11-24)	<0.001
CC	14 (7-24)	13 (7-24)	16 (7-24)	<0.001
NCT	14 (7-24)	12.5 (7-22)	16 (10-24)	0.003
CS	17 (8-23)	15 (10-23)	19 (8-23)	0.090
MCQ-30 (Total)	76 (50-112)	69 (50-94)	85 (57-112)	<0.001
DIF	23 (8-35)	16.5 (8-29)	27 (21-35)	<0.001
DDF	15 (6-25)	14 (6-20)	18 (9-25)	<0.001
EOT	23 (13-31)	22 (13-27)	23 (14-31)	0.067
TAS-20 (Total)	60 (35-83)	49.5 (35-60)	69 (61-83)	<0.001

**PA:** Panic Attacks, **AA:** Agoraphobic Avoidance, **AA<sup>2</sup>:** Anticipatory Anxiety, **D:** Disability, **HC:** Health Concerns, **PAS:** Panic and Agoraphobia Scale, **PBAW:** Positive Beliefs About Worry, **NBAU:** Negative Beliefs About Uncontrollability and Danger of Worry, **CC:** Cognitive Confidence, **NCT:** Need to Control Thoughts, **CS:** Cognitive Self-Consciousness. **MCQ-30:** Metacognition Questionnaire, **DIF:** Difficulty Identifying Feelings, **DDF:** Difficulty Describing Feelings, **EOT:** Externally Oriented Thinking, **TAS-20:** Toronto Alexithymia Scale

When examining the correlation between the scale scores of alexithymic panic disorder patients, a significant correlation was found between the total score of the Metacognition Questionnaire (MCQ-30) and the anticipatory anxiety (AA<sup>2</sup>) subscale of the Panic and Agoraphobia Scale (PAS) (p = 0.003 and p = 0.028, respectively). Additionally, a significant correlation was observed between the total score of the Toronto Alexithymia Scale (TAS-20) and the negative beliefs about uncontrollability and the danger of worry (NBAU) subscale of the Metacognition Questionnaire (MCQ-30) (p = 0.001).

The total score of the Metacognition Questionnaire (MCQ-30) was found to have a significant correlation with difficulty identifying feelings (DIF), difficulty describing feelings (DDF), and the total score of the Toronto Alexithymia Scale (TAS-20) (p = 0.001, p = 0.002, and p = 0.001, respectively). The relationship between the scale scores of alexithymic patients is presented in Table 3.

**Table 3.** Examination of the Relationship Between Scale Scores of Alexithymic Patients

	PA	AA	AA <sup>2</sup>	D	HC	PAS (Total)	PBAW	NBAU	CC	NCT	CS	MCQ-30 (Total)	DIF	DDF	EOT	TAS-20 (Total)	
PA	r	1.000	0.012	0.105	<b>0.368</b>	0.164	<b>0.488</b>	-0.045	0.289	0.106	0.136	0.225	0.153	0.310	0.141	-0.185	0.155
	p		0.953	0.589	<b>0.050</b>	0.395	<b>0.007</b>	0.818	0.129	0.585	0.483	0.240	0.428	0.102	0.467	0.336	0.422
AA	r		1.000	0.259	<b>0.410</b>	0.201	<b>0.569</b>	0.150	-0.117	0.296	0.098	0.053	0.169	0.145	0.213	-0.062	0.172
	p			0.174	<b>0.027</b>	0.295	<b>0.001</b>	0.437	0.547	0.119	0.614	0.784	0.380	0.454	0.267	0.748	0.372
AA <sup>2</sup>	r			1.000	<b>0.509</b>	0.298	<b>0.627</b>	0.195	0.266	<b>0.444</b>	0.350	0.121	<b>0.527</b>	0.312	0.289	-0.142	0.319
	p				<b>0.005</b>	0.116	<b>0.000</b>	0.311	0.163	<b>0.016</b>	0.063	0.530	<b>0.003</b>	0.100	0.128	0.464	0.091
D	r				1.000	<b>0.530</b>	<b>0.860</b>	0.059	0.270	0.331	0.035	0.141	0.188	0.279	0.018	-0.003	0.160
	p					<b>0.003</b>	<b>0.000</b>	0.760	0.156	0.080	0.859	0.466	0.328	0.143	0.928	0.990	0.408
HC	r					1.000	<b>0.657</b>	0.136	0.149	0.231	0.252	0.002	0.228	0.302	0.193	-0.015	0.324
	p						<b>0.000</b>	0.483	0.441	0.228	0.188	0.993	0.235	0.111	0.316	0.937	0.086
PAS (Total)	r						1.000	0.144	0.285	<b>0.391</b>	0.311	0.175	<b>0.409</b>	<b>0.464</b>	0.235	-0.124	0.359
	p							0.457	0.134	<b>0.036</b>	0.101	0.363	<b>0.028</b>	<b>0.011</b>	0.219	0.520	0.056
PBAW	r							1.000	-0.335	-0.325	0.165	0.351	0.310	-0.186	-0.036	0.035	-0.226
	p								0.075	0.085	0.391	0.062	0.102	0.334	0.853	0.856	0.238
NBAU	r								1.000	0.336	<b>0.595</b>	0.068	<b>0.518</b>	<b>0.685</b>	0.277	-0.096	<b>0.567</b>
	p									0.075	<b>0.001</b>	0.727	<b>0.004</b>	<b>&lt;0.001</b>	0.146	0.620	<b>0.001</b>
CC	r									1.000	0.148	-0.023	<b>0.428</b>	0.295	<b>0.447</b>	-0.172	<b>0.497</b>
	p										0.445	0.905	<b>0.021</b>	0.121	<b>0.015</b>	0.371	<b>0.006</b>
NCT	r										1.000	0.010	<b>0.709</b>	<b>0.492</b>	<b>0.641</b>	-0.132	<b>0.631</b>
	p											0.961	<b>&lt;0.001</b>	<b>0.007</b>	<b>&lt;0.001</b>	0.495	<b>&lt;0.001</b>
CS	r											1.000	<b>0.523</b>	<b>0.477</b>	-0.085	-0.295	0.081
	p												<b>0.004</b>	<b>0.009</b>	0.662	0.121	0.678
MCQ-30 (Total)	r												1.000	<b>0.597</b>	<b>0.544</b>	-0.245	<b>0.588</b>
	p													<b>0.001</b>	<b>0.002</b>	0.201	<b>0.001</b>
DIF	r													1.000	0.249	-0.263	<b>0.670</b>
	p														0.193	0.169	<b>&lt;0.001</b>
DDF	r														1.000	-0.075	<b>0.767</b>
	p															0.699	<b>&lt;0.001</b>
EOT	r															1.000	0.146
	p																0.450
TAS-20 (Total)	r																1.000
	p																

## Discussion

A total of 61 patients were included in the study, comprising 14 men (23%) and 47 women (77%). The patients' ages ranged from 18 to 65, with a median age of 40. Among the patients with panic disorder, 29 (47.5%) were found to have alexithymia. It was observed that patients with both panic disorder and alexithymia had significantly higher scores on all scales, except for the Panic Attack (PA), Cognitive Self-Consciousness (CS), and Externally Oriented Thinking (EOT) scales ( $p < 0.05$ ).

Studies have shown that patients with panic disorder exhibit higher levels of alexithymia compared to non-clinical participants, particularly in their ability to identify and describe emotions (28). In this study, 29 (47.5%) of patients with panic disorder were found to have alexithymia. A review of the literature reveals a strong association between alexithymia and panic disorder, with the estimated prevalence of alexithymia in PD patients ranging from 29% to 58% (29). This finding supports the hypothesis of a higher rate of alexithymia in patients with panic disorder.

Furthermore, the focus has primarily been on the relationship between PD and generalized anxiety disorder (GAD), with clinical studies indicating that the metacognitive beliefs associated with these disorders are often dysfunctional (30). The "need to control thoughts" and "negative beliefs about uncontrollability and danger" are examples of dysfunctional metacognitive beliefs that are believed to be more prevalent in patients with PD compared to healthy individuals (31). According to the proposed underlying mechanism, these negative metacognitive views can lead to increased self-focused attention, which in turn may exacerbate pathological anxiety. These cognitive processes may contribute to the worsening of symptoms in both PD and generalized anxiety disorder (GAD) (32). Consistent with previous studies, our research found that all scale scores, except for those related to Panic Attack (PA), Cognitive Self-Consciousness (CS), and Externally Oriented Thinking (EOT), were statistically significantly higher in panic disorder patients with alexithymia ( $p < 0.05$ ). Furthermore, the current study demonstrated a significant correlation between the total score of the Toronto Alexithymia Scale (TAS-20) and the negative beliefs about uncontrollability and danger of worry (NBAU) subscale of the Metacognition Questionnaire (MCQ-30). These findings align with earlier studies (33,34).

The findings of this study underscore the limitations of exclusively focusing on cognitive factors in the conceptualization and treatment of panic disorders. They further emphasize the potential benefits of integrating alternative therapeutic frameworks—such as Metacognitive Therapy (MCT)—which target a wider spectrum of self-regulatory and metacognitive processes.

Our study has several limitations that should be considered when interpreting the findings. The relatively small sample size may have reduced the statistical power and the ability to detect more subtle associations.

The use of self-report instruments to assess alexithymia, somatic symptoms, and attitudes toward seeking psychological support introduces the possibility of response biases, such as social desirability bias. Additionally, the cross-sectional design of the study, which only allows for the examination of the current state, complicates the identification of causal relationships between the variables, and only correlations between the variables can be observed. This limitation hinders the understanding of how the variables interact over time and how one variable may influence another. Therefore, to make definitive inferences about causality, studies employing longitudinal or experimental designs are required.

## Conclusion

This study demonstrates that metacognitive beliefs are heightened in panic disorder patients with alexithymia, and that different characteristics of alexithymia are associated with distinct metacognitive beliefs. Furthermore, various metacognitive beliefs have the potential to predict the presence of alexithymia. These findings suggest that a deeper understanding of metacognitive theory and the application of metacognitive therapy may benefit patients with alexithymia. However, further research is needed to elucidate the complex relationship between metacognitive beliefs and alexithymia, as well as to explore the effectiveness of metacognitive therapy for this population.

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