



# Investigation of the relatedness of cognitive distortions with emotional expression, anxiety, and depression

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## Abstract

It is theoretically recognized that cognitive distortions take part in the aetiology and prognosis of depression and anxiety disorders. Expressing emotions is contribute that to maintaining the mental health. This study was designed to investigate the relationship of cognitive distortions with emotional expression and the levels of anxiety and depression. The study was designed as a “Descriptive Cross-Sectional” trial. For this purpose, data were collected between September–November 2019 by applying face-to-face questionnaires from 200 first and second grade university students. Data analysis were performed using appropriate statistical analysis. In the analysis of the data, it was found that as emotional reasoning subscale score increased, intimacy expression subscale decreased. As mind reading and catastrophizing subscale scores increased, negative emotional expression subscale score increased. It was observed that as the total score of the Cognitive Distortions Scale increased, the total score of the Beck Depression Scale and the total score of the Beck Anxiety Scale increased. This study found that cognitive distortions of individuals affect their way of expressing emotions and their depression and anxiety levels. The results of our work in helping the individual psychologically can be guiding.

**Keywords** Cognitive distortions · Expressing emotions · Cognitive error · Depression · Anxiety

author

## Introduction

Cognitive processes comprise all thinking styles of the individual to understand the self, other individuals, the outer world, and events. According to Beck; the founder of the cognitive theory, cognition is a collection of emotions, attitudes, and perceptions of the individual towards the self, other individuals, and the world. This theory is based on the assumption that ways of interpreting experiences influence the

individual’s emotions, behaviours, and mental responses significantly. Furthermore, the theory argues that cognitions are much more important than the events themselves (Türkçapar, 2014). The reason behind the disproportionate or incongruent mental responses may result from the cognitive thinking patterns of the individual. Beck addresses this standpoint via the concepts of “cognitive trio”, “cognitive schemas”, and “cognitive distortions” within the frame of the cognitive construct to explain the psychopathology of depression and anxiety (Beck et al., 1985). Cognitive distortions are defined as unrealistic evaluations, biases, and tendencies in the process of information processing by the individual (Türkçapar, 2014). Cognitive distortions are “all-or-nothing thinking”, “selective abstraction”, “emotional reasoning”, “mind reading”, “catastrophizing”, “overgeneralization”, “labelling”, “magnification/minimization”, “personalization”, and “should and must” statements (Beck et al., 1985; Beck, 2001).

Emotion is described as expressions that emerge in response to specific experiences. They are accompanied by physical symptoms, they steer the behaviour, and they are difficult to identify at times (Çeçen, 2006; Hazır, 2019; Yalçın & Hamarta, 2013). Lazarus emphasizes that the process of emotion generation occurs via the perception and evaluation of environmental stimuli by the individual (Lazarus,

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1984). Besides environmental stimuli, internal stimuli are included in this process, too. Both environmental and internal stimuli are influenced by cognitive processes. Furthermore; cognitive processes take an important part in the maturation of inborn emotions, socialization, and the generation of emotional responses resulting from environmental interactions (Caouette & Guyer, 2016; Çeçen, 2006; Scott et al., 2018). Moreover, emotions play an important role in the survival, self-protection, motivation, decision-making, and action-taking processes of the individual. These processes help the individual to fulfil his or her needs and achieve his or her objectives; allowing the individual to adapt to his or her environment in a direct relationship with the concept of cognitive processing (Kuyumcu & Güven, 2012). In summary, the generation of emotions is a cognitive ability that takes place via the cognitive interpretation of stimuli.

Every single emotion in the pool of emotions has a unique role and influence in allowing the individual to adapt to living conditions. Effective management of emotions holds a significant part in adaptation. Emotion management involves *four processes* recognized as the identification of physiological reactions, emotion labelling, verbal and behavioural expression of emotions, and coping with emotions (Çeçen, 2006; Yalçın & Hamarta, 2013). Physiological responses are the most significant indicators of emotions expressed by the body. Emotion labelling is defined as the ability of the individual to recognize his or her feelings, as well as, identifying other individuals' emotions (Hazır, 2019; Kuyumcu & Güven, 2012). The emotional expression refers to the degree of showing emotions verbally or nonverbally and is defined as sharing the positive and negative emotions experienced by the individual (Çarkıt & Yalçın, 2018; Jacobson et al., 2015; Kuyumcu, 2011). Coping with emotions is defined as the capacity to manage especially negative emotions by controlling the timing of emotions, their influences on the individual, and the modes of expression; as a skill that contributes to maintaining the mental health (Berking & Whitley, 2014; Mikolajczak et al., 2008).

It seems impossible to separate the representations of these *four essential emotion management processes* from those of cognitive processes (Çeçen, 2006; Kuyumcu, 2011; Kuyumcu & Güven, 2012). The recognition and expression of emotions are of great importance for the individual for effective communication and for the prevention and resolution of conflicts (Jacobson et al., 2015). The individual needs to establish stable ways to facilitate or prevent the expression of emotions. Individual characteristics, cultural expectations, mental disorders, and cognitive distortions can prevent emotional expression (Jacobson et al., 2015; Settanni & Marengo, 2015).

It is theoretically recognized that cognitive distortions take part in the aetiology and prognosis of depression and anxiety disorders (Beck et al., 1985; Özdel et al., 2014; Scott et al., 2018). The assessment of the content and magnitude of

cognitive distortions involved in the manifestations of these disorders is critical for the entire course of the psychiatric disorder but primarily for the treatment (Kaplan et al., 2017). Addressing depression within the frame of cognitive processes; Beck et al. described the types of cognitive distortions of individuals suffering from an episode of depression (Beck, 2001). With the studies conducted over time, 10 categories of cognitive distortions were described; including “all-or-nothing thinking”, “selective abstraction”, “emotional reasoning”, “mind reading”, “catastrophizing”, “overgeneralization”, “labelling”, “magnification/minimization”, “personalization”, and “should/must statements” (Ardanç, 2017; Beck, 2001). Moreover, the underlying causes of depression symptoms; which can be somatic such as fatigue or which can be executive dysfunctions manifesting with memory and attention problems, may well be based on cognitive distortions (Bartczak & Bokus, 2015; Watkins & Moberly, 2009). Studies examining the relationship between cognitive distortions and anxiety levels demonstrate the positive relationship of anxiety levels *with the following cognitive distortions including mind reading, underestimation of coping skills, overgeneralization, personalization, intimacy avoidance, selective abstraction, emotional reasoning, catastrophizing, and disqualifying the positivethinking styles and anxiety level* (Başbuğ et al., 2017; Özdel et al., 2014; Rnic et al., 2016).

The relationship between cognitive distortions and emotional expression is suggested; however, the number of studies explaining this relationship is not sufficient. Furthermore, there is insufficient evidence about the thinking styles identified in the samples of the studies examining the relationship of cognitive distortions with depression and anxiety. In line with the aforementioned information, we designed this study to investigate the relationship of cognitive distortions with emotional expression and the levels of anxiety and depression.

## Materials and Methods

### Study Design

This study was designed using the MedicReS E-PICOS designer application (MedicReS Medical Research Support, 2017). A descriptive cross-sectional design was used. STROBE (The Strengthening the Reporting of Observational Studies in Epidemiology) checklist was used to report the study (von Elm et al., 2007).

### Sample Size (Power Analysis)

The power analysis of the study was performed by using the formula  $n = [z^2 p (1 - p) / e^2] / [1 + (z^2 p (1 - p) / (e^2 N))]$ . Where:  $z = 1.96$  for a confidence level ( $\alpha$ ) of % 95,  $p =$  proportion (expressed as a decimal),  $N =$  population size,  $e$

= margin of error. ( $z = 1.96$ ,  $p = 0.05$ ,  $N = 700$  (the total number of students in the first two classes of three faculties),  $e = 0.05$ ).

The sample size (with finite population correction) is found equal to 249 ( $n = 249$ ). Data collection forms were distributed to 250 students. 200 of them brought back the forms.

In the other power analysis; the correlation coefficient was taken as  $r = 0.30$ , revealing a sample size of a minimum of 85 and a maximum of 254 individuals.

## Participants

The sample of the study consisted of 200 students studying at the following faculties of the University of Health Sciences; including Gülhane School of Nursing, Gülhane School of Medicine, and Gülhane Vocational School of Health. Of the study participants, 104 attended the first grade and 96 attended the second grade of the abovementioned schools. Of the students of the school of nursing, 35 attended the first grade and 66 attended the second grade. Of the participants from the vocational school of health, 34 were the first-grade students and 10 were the second-grade students. Of the students of the school of medicine, 35 participants attended the first grade and 20 attended the second grade. The reason for choosing students from the first and second grades is that there are no 3rd and 4th grade students in the Vocational School of Health and that homogeneity is desired in the sample. The data of the study were collected between September 2019 and November 2019. Before including participants in the study, the recruitment for the study was announced and any required information about the study was provided. The eligible participant candidates were interviewed whether they volunteered and written-verbal consent was obtained from each student volunteering to participate in the study. The participants were informed that they could withdraw from the study at any time. The data collection form and the study questionnaires were administered to the volunteering participants at face-to-face interviews.

## Data Collection Tools

In order to collect data to test the study objectives, the Data Collection Form, the Cognitive Distortions Scale (CDS), the Emotional Expressiveness Questionnaire (EEQ), the Beck Depression Inventory, and the Beck Anxiety Inventory were used. The data collection tools we used in the study were selected considering the suitability of our sample for the age range.

## Data Collection Form

The “Data Collection Form” was developed by the researchers based on the review of the literature. The form comprised a

total of 18 questions. The questions in the form asked information about demographic data (age, gender, educational status, marital status, employment status, etc.) and cognitive distortions (medical or family history of psychiatric disorders, educational status of the family, etc.).

## Cognitive Distortions Scale (CDS)

In order to evaluate the cognitive distortions of the participants, the Turkish version of the Cognitive Distortions Scale (CDS), which was developed in 2011 by Covin and Dozois was used in the study. The validity and reliability study of the Turkish version of CDS was performed by Ardanıç in 2017 (Ardanıç, 2017; Covin et al., 2011). This scale includes scenarios inspired by daily life events to evaluate ten major cognitive errors. Each cognitive error and cognitive error-specific-scenario in the scale was explained in order to facilitate the answering of the participants. The sample of the validity and reliability study of the scale consisted of male and female participants selected from the normal population. The scale consists of ten items to evaluate ten cognitive errors. Each item serves as a sub-scale. These sub-scales are “Mind reading”, “Catastrophizing”, “All-or-Nothing”, “Emotional Reasoning”, “Labelling”, “Mental Filter”, “Overgeneralization”, “Personalization”, “Should Statements”, “Minimizing the Positive”, and “Ignoring the Positive”. Two explanatory scenarios are provided under each item. The scale items are answered on a 7-point Likert-scale ranging from 1 (Never) and 7 (Always). The sum of scores attributed to the items is calculated to find the total score. A high total score indicates a high level for cognitive distortions; whereas, a low total score indicates a low level for cognitive distortions. The Cronbach’s alpha value of the scale is 0.88. Our study population consisted of male and female students selected from the normal population, having similar characteristics to the participants of the validity and reliability study of the scale. In our study, the Cronbach’s alpha value of the scale was found to be 0.90.

## The Emotional Expressiveness Questionnaire (EEQ)

EEQ was developed by King and Emmons in 1990 on university students in order to measure the degree of verbal and non-verbal emotional expression both during interpersonal relationships and regardless of interpersonal relationships (King & Emmons, 1990). The validity and reliability study of the questionnaire in Turkish was carried out by Kuzucu in 2011 (Kuzucu, 2011). The sample of the validity and reliability study of the Turkish version of the questionnaire consisted of females and males selected from the normal population. The questionnaire consists of 15 items and three subdimensions; including “positive emotional expression”, “intimacy expression”, and “negative emotional expression”.

The questionnaire items 9, 13, 11, 4, 3, and 15 aim to evaluate the positive emotional expression, the items 6, 12, 1, 7, and 8 aim to determine the intimacy expression, and the items 2, 5, 14, and 10 aim to determine negative emotional expression. Items 6 and 14 in the questionnaire are negatively worded items and therefore they require inverse scoring. The questions can be answered by scoring on a seven-point Likert type scale, ranging from “absolutely disagree” (1) to “absolutely agree” (7). The sum of scores attributed to the items is calculated to find the total score. A high total score indicates a high tendency for emotional expression; whereas, a low total score indicates a low tendency for emotional expression. The Cronbach’s alpha value of the scale is 0.85. In our study, the Cronbach’s alpha value of the scale was found to be 0.71.

### Beck Depression Inventory (BDI)

It was developed by Beck in 1974 to measure the emotional, cognitive, and motivational depression symptoms of the participants. The validity and reliability study of the Turkish version of BDI was carried out by Hisli in 1989 (Hisli, 1989). The scale comprises 21 questions, each evaluating a behavioural pattern specific to depression. Each of the questions offers four options to the participant to answer. The offered options score any relatedness in a range from less to more (0–3). Participants are asked to mark the most suitable option by considering their mood in the last week. The scale comprises five sub-factors; including “hopelessness”, self dislike”, “somatic anxiety”, “feelings of guilt”, and “vegetative symptoms of depression”. This test can be administered to all individuals older than 15 years old regardless of whether they are healthy or suffer from psychopathological manifestations. The sum of scores attributed to the items is calculated to find the total score. A high total score indicates a high level for depression. 0–11 points: No depression, points 12–17: mild depression, 18–29 points: moderate depression, 30–63 points: evaluated as severe depression scores. Cronbach’s alpha value of the scale is 0.80. In our study, the Cronbach’s alpha value of the scale was found to be 0.80 (Hisli, 1989).

### Beck Anxiety Inventory (BAI)

In order to evaluate the anxiety symptoms of the participants, BAI was developed by Beck, Epstein, Brown, and Steer in 1988. The validity and reliability study of the Turkish version of BAI was conducted by Avcı in 1995 (Avcı, 1995; Beck et al., 1988). The scale comprises 21 items in total. The options to answer the inventory items are scored on a four-point Likert-type scale; ranging from 0 (not at all) to 3 (severely). Participants are asked to score the severity of the symptoms in the inventory items, considering how much they were bothered by that symptom during the past month, including the day the scale was administered. The scale comprises

sub-factors: “Somatic Symptoms” and “Subjective Anxiety and Panic Symptoms”. The score range of the scale is 0–63. The height of the total scores obtained on the scale indicates the severity of the anxiety experienced by the individual. 0–7 points: minimum anxiety, 8–15 points: mild anxiety, 16–25 points: moderate anxiety, 26–63 points: evaluated as severe anxiety score. The Cronbach’s alpha value of the scale is 0.94. In our study, the Cronbach’s alpha value of the scale was found to be 0.88 (Ulusoy et al., 1998).

### Data Analysis Method

We used the MedicReS E-PICOS assistant to determine the statistical method to be used in the analysis of the data (MedicReS Medical Research Support, 2017). Categorical variables were summarized in frequencies and percentages. The normal distribution was examined and since the results of the skewness and kurtosis coefficient were between +2 and – 2, which are accepted in the literature (George & Mallery, 2010; Karagoz, 2016), it was decided that to the data were normally distributed and perform the test of Pearson moments correlation test. In addition, regression tests on relationships between variables were performed. The evaluation of the data and statistical analyses were conducted by using the IBM SPSS Statistics 22 package program. For statistical decision-making, a p value of <0.05 was accepted to indicate a significant difference (Table 1).

### Ethical Aspects

The ethics committee approval with the approval number of 46,418,926 was obtained for this study from Gülhane Non-Interventional Research Ethics Committee of the Health Sciences University at the meeting on June 11, 2019, Tuesday.

### Results

#### Socio-Demographic Characteristics of the Participants

The mean age of the sample was  $19.47 \pm 1.041$ ; 80% of the participants were females; 50.5% of them studied at the school of nursing; 27.5% of them studied at the Vocational School of Health, and 22% of the participants studied medicine. Of the participants; 57% lived in dormitories and 35% had only one sibling. The only psychiatric disorder diagnosed in the study sample was Attention Deficit Hyperactivity Disorder (ADHD) and it was found in 4% of the participants. Participants undergoing psychotherapy constituted 9% of the sample and participants with a family history of psychiatric disorder constituted 9.5% of the sample. Of the participants, 15% received training on the expression of emotions.

**Table 1** Descriptive Statistics of Scales and Sub-Dimensions

	n	Min	Max	Mean	sd	Max	$\bar{x}$	S.D
<b>Cognitive Distortion Inventory total</b>	200	27		125		71,94	19,51	
Mindreading	200	3		14		8,99	2,39	
Catastrophizing	200	2		13		7,66	2,52	
Bipolar All or Nothing	200	2		13		6,73	2,70	
Emotion-to-Conclusion	200	2		14		7,78	2,85	
Labelling	200	2		14		6,58	2,86	
Mental Filter	200	2		14		7,25	3,11	
Overgeneralization	200	2		14		6,80	3,06	
Personalization	200	2		14		6,80	2,64	
Should Statements	200	2		14		6,71	2,88	
Minimizing and Ignore the Positive	200	2		14		6,62	2,96	
<b>Emotion expression Inventory total</b>	200	33		95		65,93	11,65	
Expressing Intimacy	200	13		40		25,4	5,75	
Positive Emotion Expressio	200	9		35		22,42	5,33	
Negative Emotion Expression	200	5		28		18,08	4,22	
<b>Beck Depression Inventory total</b>	200	0		55		14,92	10,11	
<b>Beck Anxiety Inventory total</b>	200	0		54		13,58	10,76	

**Model 1 Summary of the Predictor Variable (Emotion-to-Conclusion) to the Dependent Variable (Expressing Intimacy)**

Predictor Variable	Dependent Variable: Expressing Intimacy					
	B	SE	$\beta$ (Beta)	t	p	
Sabit	28,332	1166		24,294	,00	
Duygudan Sonuca	-,372	,141	-,185	-,2646	,00	
<b>R=,185</b>	<b>R<sup>2</sup>=,034</b>					
<b>F<sub>(2,365)</sub> = 6999</b>	<b>p=,009</b>					

**Model 2 Summary of the Predictor Variable (Cognitive Distortion) to the Dependent Variable (Beck Depression)**

Predictor Variable	Dependent Variable: Beck Depression					
	B	SE	$\beta$ (Beta)	t	p	
Sabit	1127	2550		,442	,55	
Cognitive Distortion	,192	,034	,370	5605	,00	
<b>R=,370</b>	<b>R<sup>2</sup>=,137</b>					
<b>F<sub>(2,365)</sub> = 31,419</b>	<b>p=,000</b>					

**Model 3 Summary of the Predictor Variable (Cognitive Distortion) to the Dependent Variable (Beck Anxiety)**

Predictor Variable	Dependent Variable: Beck Anxiety					
	B	SE	$\beta$ (Beta)	t	p	
Sabit	-,084	2744		-,031	,97	
Cognitive Distortion	,190	,037	,344	5158	,00	
<b>R=,344</b>	<b>R<sup>2</sup>=,118</b>					
<b>F<sub>(2,365)</sub> = 26,605</b>	<b>p=,000</b>					

According to the analysis on the correlation of CDS total and its sub-dimensions with EEQ total and subscales; A positive, weak statistically significant relationship was found between Negative Emotion Expression which was among the sub-dimensions of the Emotion Expression Scale and Mindreading ( $r = .146$ ;  $p = 0.03$ ), Catastrophizing ( $r = .149$ ;  $p = 0.03$ ) which were among the sub-dimensions of

the CDS. A negative, weak statistically significant relationship was found between Expressing Intimacy which was among the sub-dimensions of the Emotion Expression Scale and Emotion-to-Conclusion ( $r = -.174$ ;  $p = 0.01$ ) which were among the sub-dimensions of the Cognitive Distortion Scale (Table 2).

**Table 2** The Analysis on the Correlation of Emotion Expression Questionnaire and Its Sub-dimensions, Cognitive Distortion Scale and Its Sub-dimensions, Beck Depression Inventory and Beck Anxiety Inventory (Pearson Test)

Scales and Its Sub-dimensions	Emotion Expression Questionnaire	Expressing Intimacy	Positive Emotion Expression	Negative Emotion Expression	Beck Depression Inventory	Beck Anxiety Inventory
<b>Cognitive Distortion Scale</b>	r	0.054	0.068	-0.024	0.370**	0.344**
	p	0.45	0.34	0.73	0.00	0.00
Mindreading	r	0.086	0.013	0.091	0.146*	0.252**
	p	0.22	0.86	0.20	0.03	0.00
Catastrophizing	r	0.083	0.044	0.090	0.149*	0.175*
	p	0.24	0.54	0.20	0.03	0.01
Bipolar All or Nothing	r	0.016	0.66	0.015	-0.012	0.220**
	p	0.81	0.35	0.83	0.86	0.00
Emotion-to-Conclusion	r	-0.123	-0.174*	0.064	-0.029	0.252**
	p	0.08	0.01	0.36	0.81	0.00
Labelling	r	0.084	0.029	0.063	0.124	0.310**
	p	0.23	0.68	0.37	0.08	0.00
Mental Filter	r	-0.092	0.135	-0.065	-0.002	0.176**
	p	0.17	0.05	0.36	0.97	0.00
Overgeneralization	r	-0.031	-0.082	0.050	0.058	0.242*
	p	0.63	0.24	0.48	0.41	0.01
Personalization	r	-0.013	-0.042	-0.027	0.008	0.311**
	p	0.86	0.55	0.70	0.91	0.00
Should Statements	r	-0.038	0.013	-0.090	-0.013	0.292**
	p	0.59	0.86	0.20	0.85	0.00
Minimizing and Ignore the Positive	r	0.081	0.122	0.067	-0.042	0.343**
	p	0.23	0.08	0.34	0.55	0.00

\*p < 0.05 (double quotes); \*\*p < 0.01 (double quotes) (Statistical Significance Value) r = correlation coefficient; p = significance

When the BDI was evaluated, 88 (44%) of the sample did not have depression level, 53 (26.5%) were mild, 45 (22.5%) were moderate and 14 (7%) were severe depression was observed. According to the analysis on the correlation of CDS total and its sub-dimensions with BDI; A positive, weak and statistically significant relationship was found between BDS and Cognitive Distortion Scale total (r = .370; p = 0.00). A positive, weak statistically significant relationship was found between BDI and Mindreading (r = .252; p = 0.00), Catastrophizing (r = .175; p = 0.01), Bipolar All or Nothing (r = .220; p = 0.00), Emotion-to-Conclusion (r = .252; p = 0.00), Labelling (r = .310; p = 0.00), Mental Filter (r = .176; p = 0.00), Overgeneralization (r = .242; p = 0.01), Personalization (r = .311; p = 0.00), Should Statements (r = .292; p = 0.00) and Minimizing and Ignore the Positive (r = .343; p = 0.00) which were among the sub-dimensions of the CDS (Table 2).

When BAI was evaluated, 72 (36%) of the sample was minimum, 63 (31.5%) mild, 36 (.18%) moderate, 29 (14.5%) were severe anxiety was observed. According to the analysis on the correlation of CDS total and its sub-

dimensions with BAI; A positive, weak and statistically significant relationship was found between BAI and CDS total (r = .344; p = 0.00). No statistically significant relationship was found between BAI and Bipolar All or Nothing, which was among the sub-dimensions of the Cognitive Distortion Scale (p = 0.05). A positive, weak statistically significant relationship was found between BAI and Mindreading (r = .296; p = 0.00), Catastrophizing (r = .290; p = 0.00), Emotion-to-Conclusion (r = .186; p = 0.00), Labelling (r = .286; p = 0.00), Mental Filter (r = .233; p = 0.00), Overgeneralization (r = .287; p = 0.00), Personalization (r = .249; p = 0.00), Should Statements (r = .241; p = 0.00) and Minimizing and Ignore the Positive (r = .201; p = 0.00) which were among the sub-dimensions of the CDS (Table 2).

It was observed that the coefficients obtained as a result of the correlation analysis were not sufficient in terms of cause and effect relationship. For this reason, it was decided to perform a regression analysis for the values found to be significant in the correlation table. According to the model 1, Emotion-to-Conclusion explains 03.4% of the change in Expressing Intimacy.

According to the equation, a 1-unit increase in the level of Emotion-to-Conclusion decrease the Expressing Intimacy level by 0.372 units.

According to the model 2, cognitive distortion explains 13.7% of the change in depression level. According to the equation, a 1-unit increase in the level of cognitive distortion increases the depression level by 0.192 units. According to the model 3, cognitive distortion explains 11.8% of the change in Anxiety level. According to the equation, a 1-unit increase in the level of cognitive distortion increases the Anxiety level by 0.192 units.

## Discussion

This study was conducted to investigate the relationship of cognitive distortions with the expression of emotions and the levels of anxiety and depression. The statistical analysis results are discussed under two headings: “The Linear Relationship between Cognitive Distortions and Emotional Expression” and “The Linear Relationship of Cognitive Distortions with Depression and Anxiety”.

### Relationship between Cognitive Distortions and Emotional Expression

In our study, the relationship between cognitive distortions and the level of emotional expression was examined.

As the Cognitive Distortions Scale “emotional reasoning” subscale score increased, it was determined that the score of the Expressing Emotions Scale “intimacy expression” subscale decreased. The emotional reasoning subscale of CDS mainly evaluates the situations; in which people believe that something is right just because they feel that way, even if there is no reason. The expression of intimacy subscale score of EEQ evaluates the expression of emotions to other individuals via verbal feedback or physical contact. In this case, we can argue that it is difficult to give verbal feedback or physically contact other individuals for individuals believing that something is right just because they feel that way. The study about reluctance to emotional expression and cognitive distortions by Scott et al. demonstrated in 2018 that individuals avoided emotional expression in social environments when cognitive distortion is high (Scott et al., 2018). The unfavourable effects of cognitive distortions on physical contacting can be observed in the insecurity in relationships of individuals with cognitive distortions (Özdel et al., 2014).

As the Cognitive Distortions Scale “mind reading and catastrophizing” subscale score increased, it was determined that the score of the Expressing Emotions Scale “negative emotional expression” subscale increased. The *mind reading* subscale of CDS determines the assumption of the individual that others sometimes think negatively about him/herself

(even when nothing negative is said). The *catastrophizing* subscale of CDS evaluates the degree of negative predictions about the future; which the individual can assume even when there is no evidence. The *negative emotional expression* subscale of EEQ is the indicator of the individual’s ability to express negative emotions to people around him/her. It is thought that individuals with these two abovementioned cognitive distortions may experience negative emotions such as anger. In light of this information, the results of this study show that individuals with mind reading and catastrophizing constructs can express these negative emotions.

A review of the literature reveals the following that emotional expression regulates and repairs cognitive processes (Bartczak & Bokus, 2015), cognitive distortions cause negative emotions (Martin & Dahlen, 2005; Pace et al., 2019), and emotional responses are shaped by cognitive beliefs and thinking patterns (Özdel et al., 2014). The study by Çelikkaleli and Kale (2016) found that individuals with the ability to regulate their emotional expressions had lower levels of cognitive distortions compared to individuals; who cannot regulate their emotions (Çelikkaleli & Kale, 2016). Javidan and Mohammadi (2017) argued that individuals with the cognitive distortions of rumination, catastrophizing, and accusation may experience more problems in expressing their emotions compared to other individuals (Javidan & Mohammadi, 2017). Therefore, the abovementioned result of our study and the information in the literature indicate that cognitive distortions and emotional expression can be related to each other.

### Relationship between Cognitive Distortions and the Levels of Depression and Anxiety

When the Beck Depression Scale was evaluated, it was determined that 44% of the sample had no depression level with a score in the range of 0–11 and 7% of the sample had a severe depression level with a score in the range of 30–63. It was found that as the Cognitive Distortions Scale total score and “mind reading, catastrophizing, all-or-nothing, emotional reasoning, labelling, mental filter, overgeneralization, personalization, should statements, minimizing the positive, and ignoring the positive” subscale scores increased, the total score of the Beck Depression Scale increased. When the result of the analysis is examined, it is seen that the ten thinking styles of the sample without depression were related to depression levels. It was demonstrated that these thinking styles were related to depression levels. This result is similar to the information in the literature supporting that cognitive distortions can be identified not only in individuals with depression but also in individuals without a diagnosis of depression and that cognitive distortions are related to the level of depression (Kumar et al., 2020; Rnic et al., 2016).

In our study; the correlation of the BDI total scores with the following CDS subscales including *minimizing or*

*disqualifying the positive, personalizing, and labelling* subscales, were found to be stronger compared to the other subscales of the CDS. The *minimizing and disqualifying the positive* subscale of the CDS measures the tendency of individuals to overlook the positive events that they experience, as well as disqualifying the positive attributes of their activities (Ardanç, 2017). The *personalization* subscale of CDS evaluates the perceptions of individuals about events or situations as if they are directly associated with them despite the contrary (Ardanç, 2017). The *labelling* subscale of CDS assesses the generalized and judgmental negative thoughts of the individuals for themselves and the individuals around them, despite the evidence to the contrary. The differences in the relationship between some cognitive distortions and the levels of depression may contain subjectivity since those cognitive distortions may be related to the core beliefs of the study participants. Therefore, these results should not be generalized for the individuals; who are not diagnosed with depression (Özdel et al., 2014).

When the BAI was evaluated, it was determined that 36% of the sample had a minimum anxiety level and 14.5% of the sample had a severe anxiety level. It was found that as the Cognitive Distortions Scale total score and “mind reading, catastrophizing, emotional reasoning, labelling, mental filter, overgeneralization, personalization, should statements, minimizing the positive, and ignoring the positive” subscale scores increased, the total score of the Beck Anxiety Scale increased. Our study results demonstrate the presence of nine thinking styles related to cognitive distortions and anxiety levels. The result of our study is similar to the results of studies evaluating the relationship between anxiety levels and the levels of cognitive distortions (Cannon & Weems, 2010; Maric et al., 2011; Pereira et al., 2012). This indicates that cognitive distortions may act as factors determining anxiety.

In our study; the relationships of the CDS subscales of *mind reading, catastrophizing, and overgeneralization* with the BAI total scores were stronger compared to the other CDS subscale scores. *Mind reading* is a cognitive distortion that can be related to interpersonal relationships, social areas, achievements, and rumination. Therefore, the high levels of the correlation of the *mind reading* subscale scores with anxiety levels are similar to the study findings in the literature reporting the positive relationship between social anxiety levels and cognitive distortions (Kaplan et al., 2017). In our study; the higher correlation of the *catastrophizing* subscale score with anxiety levels compared to the levels of depression supports the information in the literature (Ardanç, 2017; Beck, 2001). Similar to the reports of studies in the literature; this study demonstrates that the *minimizing or disqualifying the positive* subscale is more strongly correlated with depression compared to anxiety (Ardanç, 2017; Beck et al., 1985). The higher correlation levels of anxiety or depression with some specific thinking styles indicate that the assessment of

thinking styles is absolutely necessary for the evaluation and the provision of care processes in the management of depression and anxiety.

## Conclusion

In the analysis of the data, it was found that as the Cognitive Distortions Scale “emotional reasoning” subscale score increased, the score of the Expressing Emotions Expression Scale “intimacy expression” subscale decreased. As the Cognitive Distortions Scale “mind reading and catastrophizing” subscale scores increased, the Expressing Emotions Scale “negative emotional expression” subscale score increased. The examination of these findings suggests that individuals, holding the belief about the truth of something based on only their feelings but in the presence of contradicting truth, have difficulties in expressing their feelings to other individuals via verbal feedback or physical contact. Also, the study results suggest that negative emotions can occur in individuals with the cognitive distortions of mind reading and catastrophizing, and that those individuals can express those feelings.

It was observed that as the total score of the Cognitive Distortions Scale and all subscale scores increased, the total score of the Beck Depression Scale increased. It was found that as except for the “all-or-nothing” subscale score of the Cognitive Distortions Scale, the Beck Anxiety Scale total score increased as the other sub-scale scores increased and the Cognitive Distortions Scale total score increased. It is demonstrated that cognitive distortions of individuals may affect the levels of depression and anxiety and, therefore, it is concluded that cognitive distortions should be addressed in the evaluation of depression and anxiety.

## Limitations of the Study

This study was not free of some limitations. Because the study sample may not be representative of all university students, the results should be interpreted carefully when generalizing to a larger population. Therefore, further conduct of similar studies is suggested. Furthermore; the preciseness of the demonstration of a cause-effect relationship will be limited considering the cross-sectional design of this study.

## Implications for Practice

The psychiatric nurse should encourage the individual for emotional expression within the framework of therapeutic communication. This practice is known to provide significant contributions to patient recovery. In light of this information, one should identify the thinking patterns that prevent the individual from emotional expression and

should take appropriate measures against respective findings. Therefore, this study will contribute to the information in the literature by determining the thinking styles; which prevent emotional expression and it will contribute to developing an evidence-based practice by psychiatric nurses to be used in patient interviews.

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Data analysis and interpretation: All authors.

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**Data Availability** The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

## Declarations

**Ethics Approval** Approval number: 46418926.

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