

RESEARCH ARTICLE / ARAŞTIRMA YAZISI

Investigation of the Role of Emotions and Emotion Regulation Skills in Symptoms of Generalized Anxiety Disorder

Yaygın Kaygı Bozukluğu Belirtilerinde Duyguların ve Duygu Düzenleme Becerilerinin Rolünün İncelenmesi

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Abstract:

In this study; the roles of the intensity of experiencing feelings of anxiety, sadness, disgust, anger, guilt, joy and calmness, and difficulties in regulating these emotions in generalized anxiety disorder (GAD) symptoms were investigated. The research was carried out with 533 participants in the 18-65 age range. Emotion Regulation Skills Questionnaire-Emotion Spesific (ERSQ- ES) and the Generalized Anxiety Disorder-7 (GAD-7) were used as assessment tools in this study. For analysis; T-test analysis and analysis of variance for repeated measurements were used. According to analysis, participants with higher levels of GAD symptoms experienced negative emotions with a higher intensity while they experienced positive emotions at a lower intensity, and experienced more difficulty regarding their ability to regulate specific emotions. Individuals in the upper-symptom group predominantly experienced feelings of anxiety and sadness while the individuals in the sub-symptom group predominantly experienced the feelings of joy and calmness. There are a significant differences about emotions and emotional patterns depending on the GAD symptoms level. The results are discussed in the light of the relevant literature.

Keywords: Emotions, Emotion Regulation, Symptoms of Generalized Anxiety Disorder.

*The study is a part of the thesis of the second author, which was carried out under the supervision of the first author.

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Öz:

Bu çalışmada; yaygın kaygı bozukluğu (YKB) belirtileri ile kaygı, üzüntü, iğrenme, öfke, suçluluk, neşe ve sakinlik duygularının yaşama yoğunlukları ve duygu düzenleme becerileri arasındaki ilişkilerin incelenmesi amaçlanmıştır. Araştırma 18-65 yaş aralığında 533 katılımcı ile gerçekleştirilmiştir. Bu çalışmada Özgül Duygular Temelli Duygu Düzenleme Becerileri Ölçeği (ERSQ-ES) ve Yaygın Anksiyete Bozukluğu7 Testi (GAD-7) değerlendirme aracı olarak kullanılmıştır. Analizler t-test ve varyans yöntemleri ile yapılmıştır. Analize göre, YKB semptomları daha yüksek olan katılımcılar daha yüksek yoğunlukta olumsuz duygular yaşarken, daha düşük yoğunlukta olumlu duygular yaşadıkları ve belirli duyguları düzenleme becerileri konusunda daha fazla zorluk yaşadıkları görülmüştür. Belirti üst grubundaki katılımcıların araştırma duygularından özellikle kaygı ve üzüntü duygusunu daha yoğun yaşadıkları bulunmuştur. Ayrıca belirti alt grubu ise neşe ve sakinlik duygularını daha çok belirtmiştir. Yaygın kaygı bozukluğu belirti düzeyine göre deneyimlenen duygularda ve duygu paternlerinde farklılıklar görülebilmektedir. Tüm bu bulgular ilgili literatür ışığında tartışılmıştır.

Anahtar Kelimeler: Duygular, Duygu Düzenleme, YKB Belirtileri.

Introduction

Generalized Anxiety Disorder (GAD) is a disorder related to everyday life that spans multiple areas and is characterized by excessive and uncontrollable anxiety (American Psychiatric Association [APA], 2013). Compared to other anxiety disorders, GAD is reported to be more resistant to treatment (Yonkers et al., 2003). Furthermore, patients suffering from GAD often experience physical symptoms (Asoglu et al., 2018). Consequently, it is emphasized that the rates of contacting primary care physicians are quite high among individuals diagnosed with GAD (Kroenke et al., 2007; Savaşhan et al., 2010). As can be seen from all this information, this disorder causes a significant negative impact on the quality of individual's life (Barrera and Nordon, 2009). For this reason, it is thought that it is important to examine the factors that play a role in the emergence and continuation of GAD. Increased emotion intensity, poor understanding of emotions, negative responsiveness to emotional experiences, and dysfunctional emotion regulation strategies are suggested as significant risk factors in the development and maintenance of GAD (Berking & Whitley, 2014). Thus, emotions and emotion regulation may be important risk factors in GAD.

It is stated that individuals with GAD tend to react more easily, quickly and intensely due to increased emotional intensity (Mennin et al., 2005). The emotional intensity of individuals diagnosed with GAD is higher than the individuals in the comparison group (Mennin et al., 2005; Salters-Pedneault et al., 2006). There is also a significant positive correlation between the level of pathological anxiety and more experiencing and reporting feelings of sadness, fear, anger and disgust (Macatee & Cogle, 2013). Moreover, it was concluded that individuals who meet the diagnostic criteria of GAD experienced negative emotions more intensely compared to the comparison group, however, there was no statistically significant difference between the two groups in terms of the severity of the positive emotions experienced (Decker et al., 2008). Similarly, Mennin et al. (2005) reported no significant difference in expressing positive emotions between people who meet the diagnostic criteria for GAD and those who do not. However some other studies indicate that both the trait and state positive emotion levels of the participants diagnosed with GAD are significantly lower than those of the control group (Eisner et al., 2009; Gross & Levinson, 1997; Llera & Newman, 2014; Power & Tarsia, 2007). Additionally; the tendency to experience more complex and self-conscious emotions such as shame and guilt, is positively related to the use of anxiety as a way of coping

(Schoenleber et al., 2014), highlighting the necessity of including it in GAD studies. As observed from all these informations, the consensus about negative emotions is higher, while the findings regarding positive emotions are contradictory in the GAD literature.

From an emotion regulation perspective, individuals diagnosed with GAD perceive less control over their emotions (Bourgeois & Brown, 2016; Gould & Edelstein, 2010), and show less self-compassion towards their internal emotional experiences (Hoge et al., 2013; Roemer et al., 2009) while exhibiting more intense emotional avoidance (Cooper et al., 2013). Therefore, difficulties in emotional regulation can be considered as crucial variables for symptoms.

When the information contained in the literature is examined, it is evident that more studies are needed to evaluate the role of different emotions and their regulation in the GAD symptoms. In this context, the aim of this study is to examine the role of anxiety, sadness, anger, guilt, joy and calmness in the symptoms of GAD, thus including both positive and negative emotions and their regulation simultaneously.

Methods**Participants**

The research was conducted with 533 participants aged 18 to 65 years who had internet access. Participants were reached through snowball sampling and volunteerism was taken as the basis for inclusion in the study. Individuals who had been diagnosed with a psychiatric disorder or had been on psychiatric medication in the last 6 months were excluded from the study. The mean age of the participants was 30.11 years (SD=10.55). The sample consisted of 380 (71.3%) women and 153 (28.7%) men. The mean age of the females was 27.92 (SD=9.36) while the mean age of the males was 35.54 (SD=11.39).

Data Collection Tools

To obtain basic information about the participants, a demographic information form was created. This form included questions regarding age, gender, marital status, socio-economic level, education level and psychiatric medication use.

For symptoms, Turkish GAD-7 was used (Konkan et al., 2013). GAD-7's original form was created by Spitzer et al. (2006) as a brief tool to evaluate GAD symptom severity. The scale consists of 7 items, each rated on a 4-point Likert type (0=never, 3=nearly every day). In this

study, the internal consistency coefficient of the whole scale was found to be .88.

To evaluate intensity of emotions and emotion regulation skills, Emotion Regulation Skills Questionnaire-Emotion Specific (ERSQ-ES) developed by Ebert and colleagues (2013) was used. The Turkish version of ERSQ-ES (Vatan, 2019) was employed. The Turkish version of the tool was used in this study. In ERSQ-ES each emotion is assessed using a 12-point Likert type (0=none, 11=quite a lot) regarding the intensity of its experience in the previous week, and then each emotion is examined separately in terms of emotion regulation skills through 12 items. A higher score obtained for each emotion from the 5-point Likert-type scale (0=never, 4=almost always) indicates that the participant has greater skill in regulating that particular emotion. In this study, the internal consistency coefficient for the entire scale was found to be .98. In addition, the internal consistency values for each emotion ranging from .89 to .97.

Procedure

The necessary permission to conduct the research was obtained from the Hacettepe University Ethics Commission (dated 03.02.2021 and numbered E-35853172-300-00001430979). Participants were recruited via social media, and voluntary participants was emphasized. Measurement tools were administered to the participants using the online survey platform (www.onlineanketler.com). After reading the informed consent form, participants were asked to complete the forms.

Data Analysis

The 25th version of the Statistical Package for the Social Sciences (SPSS) was used for data analysis. Before the analysis, the dataset was evaluated for extreme values and normal distribution. To examine univariate outliers, the total scores and sub-scale scores obtained from each

measurement tool were converted to Z values. Values not within the range of ± 3.29 were accepted as outliers and were excluded from the data set. The Mahalanobis Distance was calculated to assess the multivariate outliers, using the χ^2 distribution. Measurements at the level of $p < .001$ were accepted as multivariate outliers and not included in subsequent analyses. The recommendations of Tabachnick and Fidell (2015) were followed while determining the critical values.

In checking the normal distribution assumption, Kim's (2013) suggestions were considered. According to Kim (2013), in samples with more than 300 participants, the skewness value should be within the range of ± 2 and the kurtosis value should be within the range of ± 7 without taking the standard error values into consideration. Thus, it was concluded that all the variables considered in the analyzes showed a normal distribution.

Symptom upper group and symptom lower group were created based on GAD symptoms. While performing this grouping, the cutoff point determined by Konkan et al. (2013) for GAD-7 was used as a basis. Considering this cut-off point, participants with a GAD-7 total score below 8 formed the symptom lower group (N=374), while participants with a GAD-7 total score above 8 formed the symptom upper group (N=159). The mean scores and standard deviation values of scale scores of participants were assessed through descriptive statistics. T-test analyzes were then conducted to compare symptom groups in terms of the severity of emotions experienced in the previous week and their ability to regulate specific emotions. To examine the emotion patterns in symptom groups, repeated measures ANOVA was used.

Results

The demographic variables are displayed below.

Baseline characteristic	Symptom Upper Group		Symptom Lower Group		Full Sample	
	n	%	n	%	n	%
Gender						
Female	128	80,5	252	67,4	380	71,3
Male	31	19,5	122	32,6	153	28,7
Marital Status						
Single	117	73,6	209	55,9	326	61,2
Married	36	22,6	149	39,8	185	34,7
Partnered	3	1,9	13	3,5	16	3
Divorced	2	1,3	2	,5	4	,8
Widowed	1	,6	1	,3	2	,4
Highest Educational Level						
Primary school	1	,6	2	,5	3	6
Middle school	1	,6	0	0	1	2
Highschool	70	44	109	29,1	179	33,6
University	32	20,1	79	21,1	111	20,8
Postgraduate Degree	55	34,6	184	49,2	239	44,8

Descriptive Statistics

The mean of the total scores obtained by the participants from the GAD-7 scale is 6.68 (SD=4.67). The mean and

standard deviation values of the scores obtained by the participants from the ERSQ-ES are presented in Table 1.

Table 1. Mean Scores and Standart Deviations for ERSQ-ES

Emotion		Anxiety	Sadness	Anger	Guilt	Disgust	Joy	Calmness
Intensity	Mean	5.49	4.95	4.50	2.55	2.34	6.52	6.10
	SD	2.99	3.17	2.98	2.88	3.04	2.55	2.72
Regulation	Mean	2.56	2.63	2.58	2.50	2.45	3.00	2.81
Skill	SD	.67	.70	.81	.99	1.14	.80	.84

Note 1: The intensity of emotions experienced in the last week and emotion regulation skills for specific emotions are evaluated with the ERSQ-ES. Intensity refers to the intensity of experiencing emotion and regulation refers to the ability to regulate the specific emotion.

Note 2: The intensity of experiencing emotions is scored in the range of 0-11, and the ability to regulate emotions is scored in the range of 0-4 in ERSQ-ES.

Comparison of GAD Symptom Level Groups in terms of Experience Intensity of Specific Emotions: T-Test Results

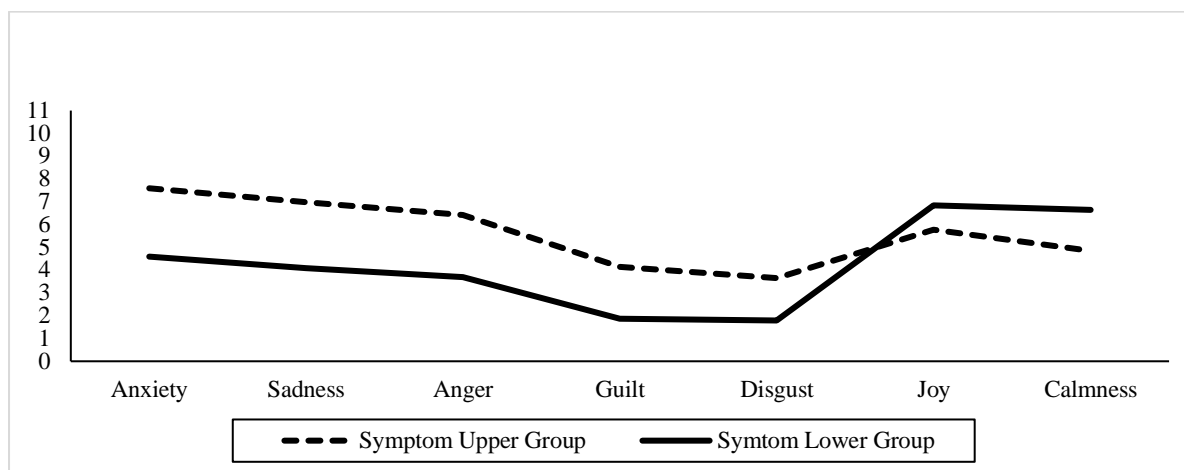
A series of t-test analyzes were conducted to examine whether there was a significant difference in the intensity

of experiencing specific emotions between the participants in the upper and lower GAD symptom groups. Analysis results are presented in Table 2 and Figure 1.

Table 2. Results of T-Test Analysis Performed to Examine Differences Between Symptom Groups in Terms of Specific Emotions

Emotion	Symptom Upper Group		Symptom Lower Group		Sd	t	p
	Mean	Sd	Mean	Sd			
Anxiety	7.59	2.47	4.60	2.74	329.31	-12.34	.000
Sadness	6.99	2.87	4.08	2.89	531	-10.70	.000
Anger	6.43	2.92	3.69	2.61	269.58	-10.22	.000
Guilt	4.13	3.30	1.88	2.39	231.70	-7.80	.000
Disgust	3.65	3.55	1.79	2.61	233.47	-5.95	.000
Joy	5.77	2.68	6.84	2.42	531	4.54	.000
Calmness	4.85	2.63	6.63	2.59	531	7.25	.000

Figure 1. Representation of the Intensity of Experience of Different Emotions for Symptom Lower and Upper Groups



Examination of Emotional Patterns in GAD Symptom Groups: ANOVA Results

In order to examine the patterns of different emotions in the upper and lower symptom groups, a 2 (Symptom Groups: lower and upper) X 7 (Emotions: anxiety, sadness, anger, guilt, disgust, joy and calmness) mixed design was created. Since the same participant rated 7 emotions, the design employed repeated measure ANOVA. In the analyses, symptom group and emotions were independent measures, while the severity of emotion was a dependent measure.

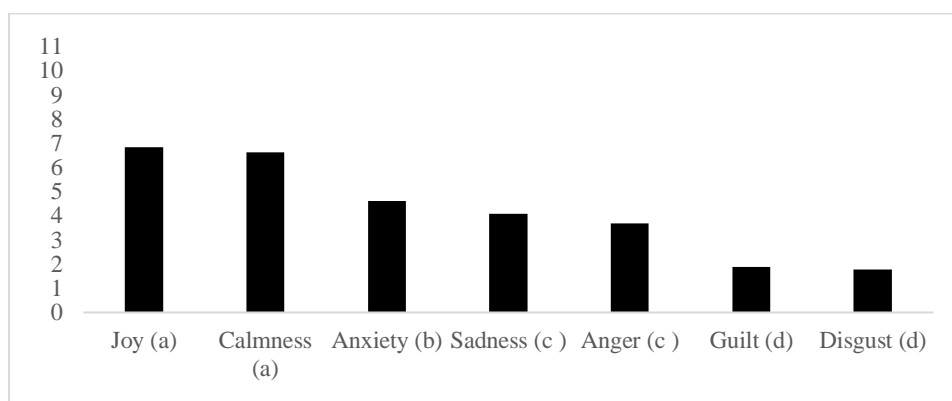
The analysis results for the intensity of emotions experienced in the past week, indicated a significant main effect of emotions, $F(4.11, 2180.36) = 146.87, p < .001$. In other words, the participants felt different emotions with varying intensities. Similarly, the interaction effect of emotions and symptom group was significant, $F(4.11, 2180.36) = 67.88, p < .001$. This indicates that the intensity pattern of the emotions experienced differ between the symptom lower-group and the symptom upper-group. Analysis results are presented in Table 3

Table 3. Repeated Measures ANOVA Results for Emotions and Symptom Group

Measure	Sum of square	Sd	Mean square	F	P
Emotions	5747.45	4.11	1399.72	146.87	.000
Emotions*Symptom Group	2656.19	4.11	646.88	67.88	.000
Error	20779.58	2180.36	9.53		

Pairwise comparisons were made by applying Bonferroni correction to examine the nature of the interaction effect. Symptom lower groups' results can be seen in Figure 2 and upper groups' results can be seen in Figure 3.

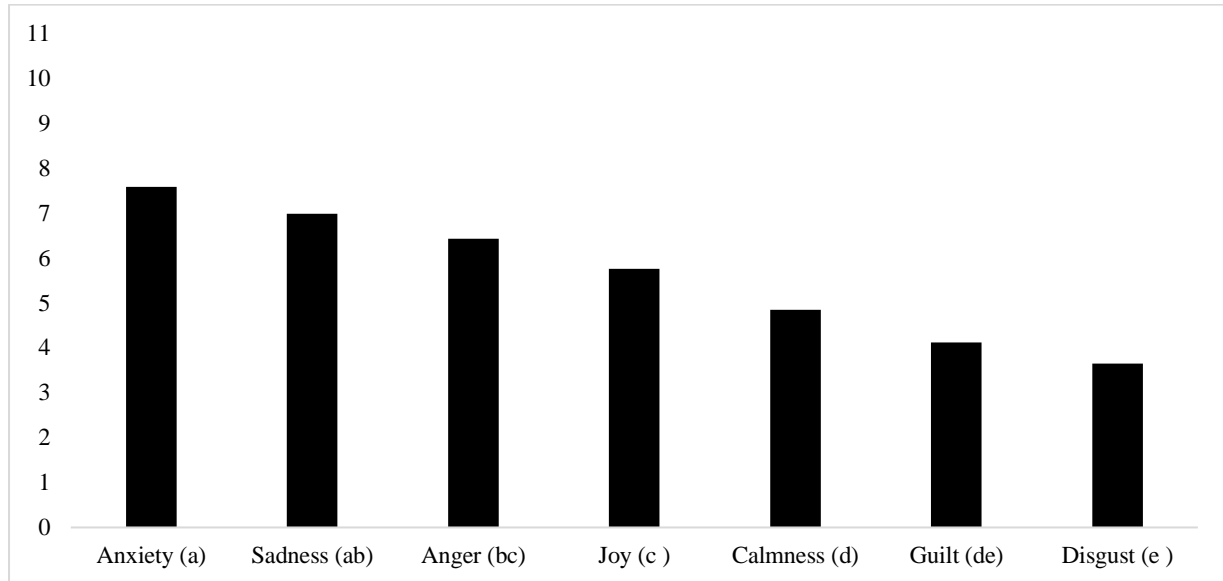
Figure 2. Intensity of Different Emotions Experienced in the Symptom Lower Group



Note1: While there are no significant differences between the mean intensity of experiencing emotions labelled with the same letter, there are significant differences between the mean intensity of experiencing emotions labelled with different letters.

Note2: Joy(Mean= 6.84, Standart Error = .13), Calmness (Mean = 6.63, Standart Error = .13), anxiety (Mean = 4.60, SE = .14), Sadness (Mean = 4.08, SH =.15), Anger (Mean= 3.69, SE = .14), Guilt (Mean = 1.88, SE = .14) ve Disgust (Mean. = 1.79, SE = .15)

Figure 3. Intensity of Different Emotions Experienced in the Upper-Symptom Group



Note1: While there are no significant differences between the mean intensity of experiencing emotions labelled with the same letter, there are significant differences between the mean intensity of experiencing emotions labelled with different letters.

Note2: Anxiety (Mean = 7.56, Standart Error = .21), Sadness (Mean = 6.99, SE = .23), Anger (Mean = 6.43, SE = .21), Joy (M = 5.78, SE = .20) Calmness (M = 4.85, SE = .21), Guilt (M = 4.13, SE = .21), Disgust (Mean = 3.65, SE= .23)

Comparison of GAD Symptom Level Groups in Terms of Specific Emotion Regulation Skills: T-Test Results

A series of t-test analyzes were conducted to examine whether there was a significant difference in the emotion

regulation skills in specific emotions between the participants in the upper and lower GAD symptom groups. Analysis results are presented in Table 4.

Table 4. Results of T-Test Analysis Performed to Examine Differences Between Symptom Groups in terms of Spesific Emotions

Emotions	Symptom Upper Group		Symptom Lower Group		df	t	P
	M	SD	M	SD			
Anxiety	2.34	.58	2.66	.68	345.20	5.57	.000
Sadness	2.37	.62	2.74	.70	531	5.70	.000
Anger	2.33	.73	2.68	.82	531	4.53	.000
Guilt	2.35	.82	2.56	1.05	375.21	2.43	.02
Disgust	2.31	1.02	2.51	1.19	345.66	2.03	.04
Joy	2.75	.86	3.10	.76	267.49	4.51	.000
Calmness	2.54	.86	2.92	.80	279.84	4.80	.000

Discussion

The aim of this study was to examine the effects and importance of specific emotions and emotional patterns in GAD symptoms. According to the research results, participants in the symptom upper group experience the feelings of anxiety, sadness, anger, guilt and disgust significantly more intensely, while they experience the positive emotions of joy and calmness significantly less intensely compared to individuals in the symptoms lower group. In other words, experiencing negative emotions more intensely and experiencing positive emotions less intensely significantly distinguish GAD symptom groups.

GAD is a psychiatric disorder within the category of anxiety disorders (APA, 2013). In this context, it was expected that individuals in the symptom upper group would experience anxiety more severely. The findings of this study support this expectation, as anxiety was both the most common emotion experienced in the symptom upper group and significant different from the other group. Understanding emotions beyond anxiety is also important and may deepen knowledge about GAD. The relationships between feelings of sadness, anger, guilt and disgust, which are considered as negative emotions in this study, and GAD symptoms are also consistent with existing literature. Participants diagnosed with GAD reported significantly more sadness (Hanley, 2014; Macatee & Cougle, 2013), more anger (Hawkins ve Cougle, 2011; O'Brien et al., 2019) more disgust (Macatee ve Cougle, 2013; Power & Tarsia, 2007) and more shame and guilt (Nasiri et al., 2020; Schoenleber et al., 2014). This study demonstrated that both the frequency of experiencing these emotions and the difficulty in regulating them were significantly different in symptom groups.

As mentioned earlier in the introduction part, negative emotions especially anxiety or worry have been widely studied in GAD. According to Pawluk et al. (2021), the attention paid to positive emotions in the context of GAD is relatively new. Similarly, in many different areas, positive emotions have been overshadowed by negative emotions. The relationship between positive emotions and GAD symptoms has not been studied much. Moreover, in the limited literature available there has not been a complete consensus on the effects of positive emotions in GAD symptoms. In this study, a significant difference was obtained between the two groups regarding the level of experiencing feelings of joy and calmness and their regulation skills. As expected, the symptom lower group was able to experience these emotions more frequently and regulate them better. However, the findings regarding the emotion ranking in the upper group are interesting: joy and calmness ranked higher than guilt and disgust. Thus; while positive emotions in anxiety disorders may be less prevalent than in comparison group, this does not mean they are the least experienced emotions. Additionally, difficulties in regulating both negative and positive emotions were found to be associated with GAD symptoms. Therefore, it can be concluded that emotion regulation skills regarding positive affect are as important as those regarding negative affect. Focusing on the

experience and regulation of positive emotions, especially in anxiety-related symptoms, can be enriching (Vatan, 2017).

The findings of this study provide valuable insights, particularly in understanding different emotions beyond anxiety in GAD symptoms. Emotion regulation skills were also examined. Another important aspect of this study is that different emotions were considered separately while also being analyzed together in the same sample at the same time. Consequently; the results contribute significantly to both theoretical and applied literature regarding the understanding of emotions and emotion regulation in GAD.

There are also some limitations of the study as well as contributions. Among the limitations of the study is the use of the cross-sectional method, which means the information obtained is relational in nature, making it impossible to establish causal connections. GAD symptoms were evaluated, which poses challenges to establishing a direct relationship between the related variables and the diagnosis of GAD. Additionally, when forming groups based on symptom levels, the groups were not matched in terms of variables such as age, gender, education level, and occupation. This should be considered when evaluating the results of the study. Finally, it is recommended that future studies examine different dimensions of emotion regulation skills for specific emotions.

Declarations

Ethical Approval and Consent to Participate

Ethical approval has been granted to this study by Hacettepe University Ethics Committee (Decision no: E-35853172-300-00001430979; Date: 26.01.2021).

Consent for Publication

Not applicable.

Availability of Data and Materials

The data can be made available upon research request.

Competing Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Author Contributions

SV has proposed the main idea of the research and substantially contributed to all stages of the study. SB contributed to data collection, interpretation, and discussion. SB contributed to data collection and manuscript revision. SV contributed to manuscript revision and supervision. All authors have read and approved the final article.

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