

HOW DOES COGNITIVE FLEXIBILITY ASSOCIATE WITH DEPRESSIVE SYMPTOMS? A MULTIPLE MEDIATION MODEL INCLUDING EMOTION DYSREGULATION AND PROBLEM-SOLVING*

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ABSTRACT

According to the cognitive-behavioral model of depression, inflexibility in thought processes increases symptoms by causing more negative emotions and behavioral problems. Previous studies have empirically shown that cognitive flexibility is negatively associated with difficulties in emotion regulation, inadequate problem-solving, and depressive symptoms. However, no research includes these variables together to the best of our knowledge. We aimed to examine the relationships between these variables and test the mediating effect of emotion dysregulation and problem-solving between cognitive flexibility and depressive symptoms via multiple mediation analysis. 275 undergraduate students participated in this study. We used a self-report battery including the Cognitive Flexibility Inventory, Difficulties in Emotion Regulation Scale, Problem Solving Inventory, and Beck Depression Inventory to collect the data. We tested the hypotheses via Pearson correlation analysis and multiple mediation analysis. According to the results, higher levels of cognitive flexibility were significantly associated with lower depression, inadequate problem solving, and emotion dysregulation. Moreover, emotion dysregulation has a mediating role in the relationships between cognitive flexibility and depressive symptoms. Inadequate problem-solving, however, was not a significant mediator. Consistent with previous findings, our results supported the importance of emotion dysregulation and cognitive flexibility for depression. Our study demonstrated the pathways of these variables. Also, results indicated that different therapy approaches that address cognitive flexibility and emotion regulation (e.g., cognitive-behavioral therapy, acceptance and commitment therapy, and emotion-focused therapy) might effectively reduce depressive symptoms.

Key Words

Depression, Flexibility, Cognitive Flexibility, Emotion Regulation, Problem-Solving

BİLİŞSEL ESNEKLİK, DEPRESİF BELİRTİLERLE NASIL İLİŞKİLENDİRİLİR? DUYGU DÜZENLEME GÜÇLÜĞÜ VE PROBLEM ÇÖZMEYİ İÇEREN ÇOKLU BİR ARACILIK MODELİ

ÖZ

Depresyonun bilişsel-davranışçı modeline göre, düşünce süreçlerindeki katılık, olumsuz duyguların ve davranışsal sorunların artmasını tetikler ve depresif belirtilerin artışına neden olur. Önceki çalışmalar ampirik olarak bilişsel esnekliğin duygu düzenlemedeki güçlükler, yetersiz problem çözme ve depresif belirtilerle negatif yönde ilişkili olduğunu göstermiştir. Ancak, bildiğimiz kadarıyla, bu değişkenleri birlikte inceleyen bir araştırma bulunmamaktadır. Bu nedenle, mevcut çalışmada bu değişkenler arasındaki ilişkileri incelemeyi ve duygu düzenleme ve problem çözmenin bilişsel esneklik ile depresif belirtiler arasındaki aracılık etkisini çoklu aracılık modeli ile test etmeyi amaçladık. Araştırmanın örneklemini, 275 lisans öğrencisi oluşturmaktadır. Veri toplama araçları olarak, Bilişsel Esneklik Envanteri, Duygu Düzenlemede Güçlükler Ölçeği, Problem Çözme Envanteri ve Beck Depresyon Envanteri kullanılmıştır. Sonuçlara göre, daha yüksek bilişsel esneklik seviyeleri, daha düşük depresyon, yetersiz problem çözme ve duygu düzenleme güçlüğü ile anlamlı şekilde ilişkili bulunmuştur. Ayrıca bilişsel esneklik ile depresif belirtiler arasındaki ilişkide duygu düzenleme güçlüğü'nün aracı rolü vardır. Ancak yetersiz problem çözmenin, bu ilişkide anlamlı bir aracı rolünün olmadığı saptanmıştır. Önceki bulgularla uyumlu olarak, mevcut araştırmanın bulguları duygu düzenleme güçlüğü'nün ve bilişsel esnekliğin depresif belirtilerin ortaya çıkışındaki önemini desteklemektedir. Ayrıca sonuçlar, bilişsel esneklik ve duygu düzenlemeyi ele alan farklı terapi yaklaşımlarının (örneğin, bilişsel-davranışçı terapi, kabul ve kararlılık terapisi ve duygu odaklı terapi) depresif belirtileri etkili bir şekilde azaltabileceğine yönelik kanıtlar sunmaktadır.

Anahtar Kelimeler

Depresyon, Esneklik, Bilişsel Esneklik, Duygu Düzenleme, Problem Çözme

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Introduction

Depression, one of the most experienced psychological disorders, is characterized by a persistent negative mood that might significantly damage people's functionality (Young et al., 2001) is a globally-prevalent mental health problem. Depression is also common comorbidity in people with other mental disorders and physical diseases (Kang et al., 2015; Katon, 2003; Kaiser et al., 2021). Understanding the risk and maintaining factors of depression is critical since depressive symptoms can negatively affect individuals, cause workforce loss, become chronic, and pose a risk of suicide (American Psychiatric Association, 2013; Daly et al., 2010; McTernan et al., 2013).

According to the cognitive model of depression (Beck et al., 1979), the depressive mood is closely related to individuals' cognitive distortions and negative schemas. Negative thoughts have some negative consequences such as feelings that are hard to regulate and problematic behaviors. For this reason, in cognitive-behavioral therapy (CBT) for depression, negative and rigid thoughts are tried to change with the functional and adaptive thoughts (Beck, 1991; Beck et al., 1979). This has been handled as a fundamental principle ensuring the effectiveness of CBT because depressed individuals have rigid thoughts and have difficulty flexing those (Young et al., 2001). When viewed from this perspective, cognitive flexibility is one of the significant factors of depressive symptoms.

In recent years, cognitive flexibility has been studied with several variables and defined as a switch between thoughts, and the ability to adapt to specific situations and look at different perspectives (Stevens, 2009). Cognitive flexibility could be generally defined as switching cognitive skills to adapt to changing environmental situations (Dennis & Vander Wal, 2010). It can be measured with both some behavioral tasks and self-report tools. In both methods, it has been emphasized that cognitive flexibility is negatively associated with several psychological symptoms and psychopathology (e.g., Chamberlain et al., 2006; Hayes et al., 2006; Tchanturia et al., 2012;) specifically depression (Dağ & Gülüm, 2013; Wang et al., 2019; Yazar & Meterelliyoz, 2019; Zarei et al., 2018).

To the best of our knowledge, however, few studies investigated to what extent cognitive flexibility predicts depression severity. Palm and Follette (2011) reported that cognitive flexibility could significantly predict depressive symptoms of traumatized individuals or even stated that other variables may play a crucial role in this relationship. Thus, we can say that some variables associated with both cognitive flexibility and depression may have an essential mediating role between cognitive flexibility and depression. Based on this interpretation and the cognitive-behavioral model of depression (negative thoughts may affect emotions and behaviors), two of them may be emotion regulation and problem-solving.

Some researchers suggested that mood alterations in depression may be related to some problems and difficulties in emotion regulation (e.g., Campbell-Sills & Barlow, 2006; Ehring et al., 2010; Kring & Werner, 2004). According to Aldao (2013), emotion regulation is the ability of individuals to manage their emotional experiences and behave appropriately against changing demands by changing situations that reveal these feelings. This definition is suggestive of cognitive

flexibility. Also, Radkovsky et al. (2014) emphasized how emotion regulation strategies related to cognitive flexibility should be explained in future studies. After all, recent studies demonstrated that emotion regulation is moderately associated with cognitive flexibility (Baginski, 2015; Zarei et al., 2018).

The ability to problem-solve is related to cognitive flexibility and depression since individuals who can change their thoughts may solve their problems (Krems, 1995), so they may feel less depressed. Nezu and Ronan (1985) showed that the lack of problem-solving is correlated with psychopathology symptoms like depression. Besides, it has been stated that problem-solving is one of the emotion regulation strategies (Aldao et al., 2010). Also using adaptive strategies contribute the adequate levels of problem-solving (Gross, 1998). Therefore, both having less difficulty in emotion regulation and success in problem-solving might lead one's emotional state to a positive side.

Despite all findings in the literature, no study in which cognitive flexibility, emotion regulation, and problem-solving were used to explain depression together did not encounter. Yet, these variables are said to be fundamental and vulnerability factors for depression. Especially cognitive flexibility may be one of the dominant features of the cognitive-behavioral model and therapy of depression. Furthermore, emotion dysregulation and inadequate problem-solving skills may play a mediator role in the relationship between cognitive flexibility and depressive symptoms. According to the cognitive-behavioral model, what determines our emotions and behaviors is how we interpret the events (Beck, 2011). Thus, the model in which cognitive flexibility is a predictor and emotion dysregulation and inadequate problem-solving are the mediator variables may be successful in predicting depressive symptoms. In this study, we aimed to investigate the relationship between these variables and test a multiple mediation model (see Figure 1). We firstly hypothesized that as cognitive flexibility increases, emotion dysregulation and inadequate problem-solving decrease. Also, our second hypothesis was the significant mediator roles of emotion dysregulation and problem-solving in the relationship between cognitive flexibility and depressive symptoms.

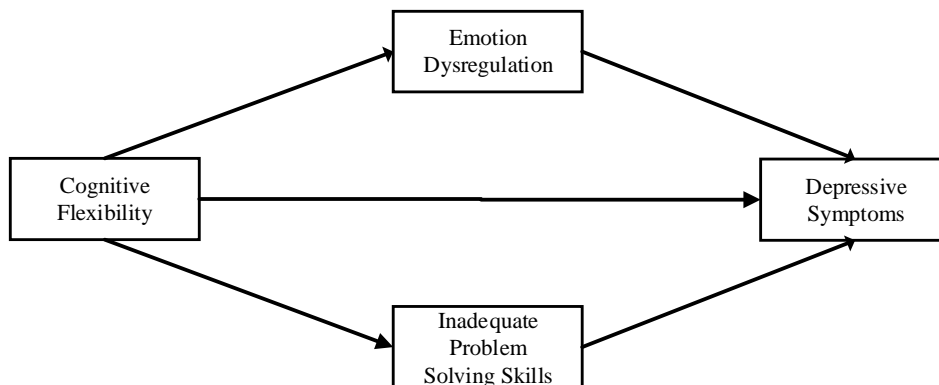
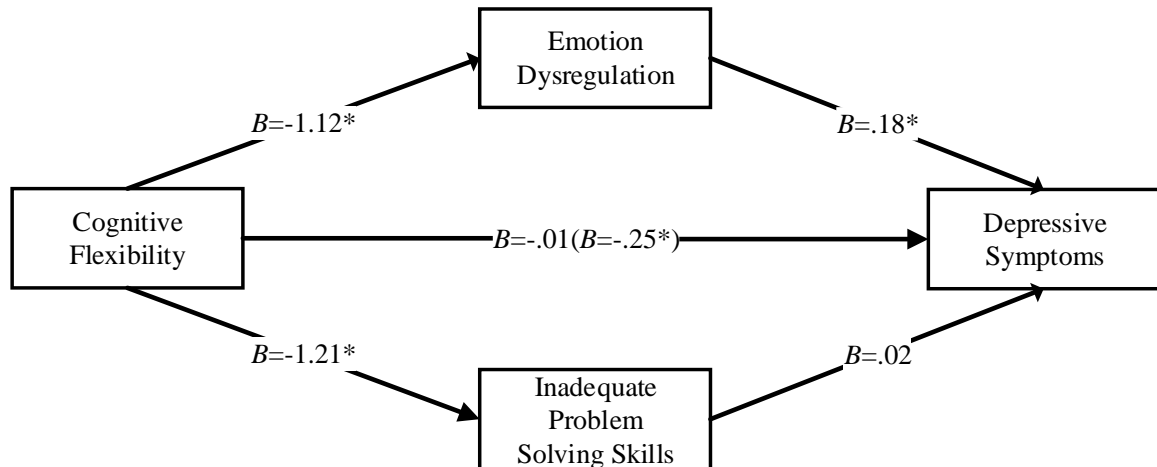


Figure 1. Proposed multiple mediation model

Note. The model predicts that cognitive flexibility will increase depressive symptoms through emotion dysregulation and inadequate problem solving skills.



Note. * 95% confidence interval does not include 0. Gender was controlled for this analysis.

Figure 2. The mediating role of inadequate problem solving skills and emotion dysregulation on the relationship between cognitive flexibility and depressive symptoms.

Method

This is a cross-sectional study of 275 university students studying at Ege University. Convenience sampling method was used for this study.

Participants

The study consists of 275 undergraduate students, of whom 209 were female (76 %), from Ege University in Izmir, Turkey. The mean age of participants is 20.6 ($SD=2.52$) and most of the participants are single (98 %). Being over the age of 18 and volunteering to participate in the research are the inclusion criterias of the research. Being outside the age range of 18-65, not volunteering to participate, and having a psychiatric diagnosis are also the exclusion criterias of the current study.

Measurements

Cognitive Flexibility Inventory (CFI): The CFI is a 20-item, seven-point Likert scale, a self-report measure designed by Dennis and Wander Wal (2010) to assess individuals' cognitive flexibility levels. The CFI consists of two subscales: alternatives and control. The CFI has a reliable factor structure, good test-retest reliability, good concurrent validity, and excellent internal consistency (Dennis & Vander Wal, 2010). The Turkish version of the CFI has the same factor structure as the original CFI, and also it is a reliable instrument (Gülüm & Dağ, 2012). Higher points indicate that the individual has a high level of cognitive flexibility. In our study, Cronbach's alpha coefficient of the CFI was 0.90.

Difficulties in Emotion Regulation Scale (DERS): The DERS is a 36-item, five-point self-report questionnaire designed by Gratz and Roemer (2004) to evaluate multiple domains of emotion dysregulation. Higher scores indicate higher levels of difficulties in emotion regulation. The scale consists of a total score and six subscales. It has high internal consistencies and satisfactory test-retest reliability coefficients. The Turkish version of the DERS shows the 6-factor structure as the original scale and satisfactory internal consistency and test-retest reliability

(Rugancı & Gençöz, 2010). In our study, Cronbach's alpha coefficient of the DERS was 0.93.

Problem Solving Inventory (PSI): The PSI is a 35-item, five-point self-report questionnaire designed by Heppner and Petersen (1982) to assess individuals' perceptions about their problem-solving ability and style. Higher points indicate that the individuals perceive themselves as inadequate in problem-solving skills. The PSI includes three subscales: approach-avoidance style, personal control and problem-solving confidence. Reliability coefficients indicate that the PSI is stable over two weeks and internally consistent. The PSI was translated into Turkish by Şahin et al. (1993). The Turkish version has indicated that it is a valid and reliable scale. It has six subscales and a total score. The Cronbach's alpha reliability coefficient of the PSI in our study was 0.91.

Beck Depression Inventory (BDI): The BDI is 21 item self-report questionnaire was developed by Beck et al. (1961) to evaluate the presence and severity of depression symptoms. The reliability of the BDI was high. The Turkish version of the BDI was adapted by Hisli (1989) and shown to be a valid and reliable measurement. In our study, the Cronbach alpha reliability coefficient of the BDI was .86.

Procedure

Following the ethical committee permission obtained by the Ege University Scientific Research and Publication Ethics Committee (*Protocol Number: 89-2014*), the data collection started. Data collection was carried out between November 2015 and January 2016. Two hundred seventy-five participants who signed informed consent forms completed forms consisting of the CFI, DERS, PSI, and BDI in classroom settings. The demographic information form was initially given to the participants; the other four scales were given in varying order. Participants completed the instruments in approximately 20 min.

Data Analysis

The analyses were conducted via SPSS 24.0 (*Statistical Package for Social Sciences*). Descriptive statistics were calculated for all the variables. Pearson correlations were used to investigate the relationships among the variables. To test the proposed model, we used a multiple mediation model in PROCESS MACRO (Hayes, 2013; Model 4, 5,000 bootstrap sample). Statistically significant indirect effects have been evaluated according to 95% bootstrap confidence intervals. If zero is not contained in the 95% confidence interval for the indirect effect, there is clear evidence that the indirect effect is positive to a "statistically significant" (see, Hayes, 2013).

Results

Table 1. Descriptive statistics and intercorrelations of study variables

| | M | SD | α | 1 | 2 | 3 | 4 |
|---------|-------|-------|----------|-------|------|------|---|
| 1. CFI | 77.02 | 10.37 | .90 | - | | | |
| 2. DERS | 79.82 | 20.23 | .93 | -.58* | - | | |
| 3. PSI | 87.92 | 21.08 | .91 | -.60* | .47* | - | |
| 4. BDI | 10.20 | 7.39 | .86 | -.36* | .55* | .32* | - |

Note. $N=275$, * $p<.01$

CFI: Cognitive Flexibility Inventory, DERS: Difficulties in Emotion Regulation Scale, PSI: Problem Solving Inventory, BDI: Beck Depression Inventory

Means, standard deviations, internal consistencies and intercorrelations for the full sample are shown in Table 1. The correlation coefficients were examined to assess the zero-order relationships among CFI, DERS, PSI, and BDI. Accordingly, relationships between all scales were significant. Cognitive flexibility was negatively correlated with all other measures, and the other correlations were significantly positive ($p<.01$). The highest correlation coefficient displays between cognitive flexibility and inadequate problem-solving skills ($r= -.60$, $p<.01$).

Table 2. Multiple mediation model linking cognitive flexibility to the depressive symptoms via inadequate problem solving skills and emotion dysregulation

| Inadequate Problem Solving Skills | | | | | |
|-----------------------------------|--------|------|--------|------|------------------|
| Predictor | B | SE | t | p | LLCI to ULCI |
| Constant | 181.08 | 8.13 | 22.24 | .000 | 165.05 to 197.10 |
| Gender | .53 | 2.39 | .22 | .823 | -4.18 to 5.24 |
| CF | -1.21 | .09 | -12.32 | .000 | -1.41 to -1.02 |
| Emotion Dysregulation | | | | | |
| Predictor | B | SE | t | p | LLCI to ULCI |
| Constant | 168.99 | 7.93 | 21.28 | .000 | 153.36 to 184.61 |
| Gender | -1.92 | 2.33 | -.82 | .411 | -6.52 to 2.67 |
| CF | -1.12 | .09 | -11.68 | .000 | -1.31 to -.93 |

| Depressive Symptoms | | | | | |
|-------------------------------------|----------|-----------|---------------|-----------|------------------------|
| Predictor | <i>B</i> | <i>SE</i> | <i>t</i> | <i>p</i> | LLCI to ULCI |
| Constant | -4.40 | 5.87 | -.74 | .454 | -15.96 to 7.16 |
| Gender | -.69 | .87 | -.79 | .428 | -2.41 to 1.02 |
| ED | .18 | .02 | 7.99 | .000 | .13 to .22 |
| IPSS | .02 | .02 | 1.10 | .268 | -.01 to .06 |
| CF (Direct Effect) | -.01 | .04 | -.37 | .709 | -.11 to .07 |
| CF (Total Effect) | -.25 | .04 | -6.36 | .000 | -.33 to -.17 |
| | | | <i>Effect</i> | <i>SE</i> | Boot LLCI to Boot ULCI |
| Bootstrap for total indirect effect | | | -.23 | .03 | -.31 to -.16 |
| Bootstrap for indirect effect IPSS | | | -.03 | .02 | -.09 to .02 |
| Bootstrap for indirect effect ED | | | -.20 | .03 | -.28 to -.14 |

Note. N= 275

CF: Cognitive Flexibility, ED: Emotion Dysregulation, IPSS: Inadequate Problem Solving Skills

To investigate if emotion dysregulation and inadequate problem-solving skills have a mediator effect, the relationship between cognitive flexibility and depressive symptoms was examined by mediation analysis. In this analysis, we included gender as a covariate. Table 2 presents the results of the mediation analysis.

According to the results, cognitive flexibility had a significant direct effect on emotion dysregulation ($B= -1.12, t= -11.68, p < .001, 95\% CI= [-1.31 to -.93]$) and inadequate problem-solving skills ($B= -1.21, t= -12.32, p < .001, 95\% CI= [-1.41 to -1.02]$). And also, emotion dysregulation had a significant direct effect on depressive symptoms. However, the direct effect of inadequate problem-solving skills on depressive symptoms was not significant. When indirect effects were examined, the total indirect effect of cognitive flexibility on depressive symptoms via inadequate problem-solving skills and emotion dysregulation was significant ($B= -.23, Boot SE= .03, 95\% BCa bootstrap CI= [-.31 to -.16]$). When the possible mediators were examined separately, the indirect effect of cognitive flexibility on depressive symptoms via emotion dysregulation was significant because the 95% confidence interval did not include zero ($B= -.20, Boot SE= .03, 95\% BCa bootstrap CI= [-.28 to -.14]$). However, the indirect effect of cognitive flexibility on depressive symptoms via inadequate problem-solving skills was not significant, because the 95% confidence interval included zero ($B= -.03, Boot SE= .02, 95\% BCa bootstrap CI= [-.09 to .02]$). Considering the covariate, analysis showed that gender was not significantly associated with depression ($B= -.69, t=-.79, p > .05, 95\% CI= [-2.41 to 1.02]$). Therefore, it can be said that emotion dysregulation has a significant

indirect effect on cognitive flexibility and depressive symptoms. However, inadequate problem-solving skills do not have a significant indirect effect on these relations (see Table 2; Figure 2).

Discussion

The primary aim of this study is to understand the mediating role of problem-solving skills and emotion dysregulation on the relationship between cognitive flexibility and depressive symptoms. In line with these objectives, primarily, bivariate correlations between all variables were investigated. Correlations between CFI and other variables are negative because, unlike other scales, higher scores on CFI indicate increased cognitive flexibility. Therefore, these results support the literature and the nature of measurement tools (e.g., Baginski, 2015; Bilgin, 2009; Krems, 1995).

Besides, in parallel with many other studies, while conducting the multiple mediation analysis, gender was included as a covariate; since the higher prevalence of the major depressive disorder among females compared to males has been coherently observed among adults in the non-clinical sample (Cyranowski et al., 2000; Kendler et al., 2001). However, gender had no significant effect on outcomes. On the other hand, the most prominent finding to emerge from the analysis is that while emotion dysregulation has a full mediator role between cognitive flexibility and depressive symptoms, mediating role of problem-solving skills is not significant. Problem-solving skills had a significant mediating role among these variables when they entered analysis alone. But, when emotion dysregulation entered into the model with problem-solving, the mediator role of problem-solving skills disappeared.

A possible explanation for these results might be that impairments in cognitive flexibility have shown a relationship with an understanding of emotions, which is a step toward successful emotion regulation (Shamary-Tsoory et al., 2003). Depressive symptoms negatively correlate with additional emotion regulation, such as problem-solving (Aldao et al., 2010). This close relationship between emotional dysregulation and problem-solving skills reveals a non-significant pathway to problem-solving in the multiple mediation model. Considering that depression is a mood disorder, this finding is understandable. It is not surprising that the full mediator role of emotional dysregulation, as a symptom scan directly related to emotions, is collected.

Furthermore, this finding is consistent with that of Deveney and Deldin's (2006) study, which shows how cognitive flexibility contributes to maintaining depression symptoms. Other researchers have reported that cognitive flexibility is related to emotion regulation and resilience, especially when processing affective information (Genet et al., 2013; Malooly et al., 2013). Similarly, some researchers suggest that a positive mood state can promote cognitive flexibility and creative problem-solving skills in the non-psychiatric sample (Ashby et al., 1999). Therefore, it can be said that flexible cognition is needed for adaptive emotion regulation (Fredrickson & Branigan, 2005). In the light of this information, it cannot be denied that the effect of the mentioned variables on depression is a mood disorder. Moreover, this study is crucial because it adds dimension to what

needs to be emphasized in treating depression. It is also important because this study also reveals which variable explains the relationship between cognitive flexibility and depression.

Besides, this study indicates the importance of the two therapy models CBT; acceptance commitment therapy (ACT) and emotion-focused therapy (EFT). Cognitive flexibility is one of the components of psychological flexibility. Psychological inflexibility is evaluated as the primary source of psychopathology (Hayes et al., 2006) and a protective factor in a wide range of mental disorders (Ruiz, 2010) is the underlying structure of ACT movement (Hayes et al., 2012). According to Whiting et al. (2017), ACT interventions to treat psychopathology, especially depression, increase cognitive flexibility. Improving cognitive flexibility skills may help support mental health and prevent psychological problems later (Viskovich & Pakenham, 2018). As for EFT, an emotion-based therapy is beneficial in treating depression (Johnson & Denton, 2002). Also, the second principle of EFT involves emotion regulation (Greenberg, 2004). It is essential to use these therapeutic approaches in treating depression for these reasons. Even integrating these two therapeutic approaches will have more effective results in treating depression.

On the other hand, resilience is closely related to depression in the literature. According to Edward (2005), being psychologically resilient is a protector against depression. Also, resilience is associated with the flexibility (Hildebrandt et al., 2016), problem-solving skills (Coşkun et al., 2014), and the outcome of successful emotion regulation (Min et al., 2013). Hence, analysis in structural equation modeling, including resilience and other relevant variables, is considered to provide more specific results.

Although this research has remarkable findings, this study has a few limitations. Due to the study's cross-sectional nature, it is impossible to draw causal conclusions from the results. Deeper and more reliable information could be obtained if it had been done longitudinally. An additional limitation is that this study used a non-clinical sample, so it is thought that the studies with the clinical sample with depression will present more detailed findings. Finally, the analysis was utilized via self-report scales. Especially cognitive flexibility can be measured by neuropsychological tests or tasks (e.g., Wisconsin Card Sorting Test). Studies with various interview methods or diagnostic evaluation systems will facilitate the acquisition of more specific findings.

Future studies should take into consideration these issues. Treatments may focus specifically on developing adaptive emotion regulation strategies that may help reduce the risk for depression. These findings could offer some significant points that might be used to prevent the development of psychopathology, especially major depression, and reduce symptom severity. In addition, since concepts such as emotion regulation and cognitive flexibility are described as transdiagnostic factors (e.g., Kring ve Sloan, 2009; Schaeuffele et al., 2022) related to different psychopathologies, it is recommended that this model be tested on different psychopathology symptoms.

In conclusion, this study aims to investigate two variables that may help explain the association between cognitive flexibility and depressive symptoms. According to the results, emotion dysregulation has a mediator role between cognitive flexibility and depressive symptoms. This finding emphasizes the importance of CBT in treating depression again and highlights that ACT and EFT may also contribute to this treatment.

References

- Aldao, A. (2013). The future of emotion regulation research: Capturing context. *Perspectives on Psychological Science, 8*(2), 155-172.
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*(2), 217-237.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.
- Ashby, F.G., Isen, A.M., & Turken, U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review, 106*, 529-550.
- Baginski, A. (2015). *Attention regulation, emotion regulation, and cognitive flexibility as mediators of the relationship between mindfulness and academic achievement in high school students* (Doctoral dissertation, Eastern Illinois University).
- Beck, A.T. (1991). *Cognitive therapy and emotional disorders*. Londra: Penguin Psychology.
- Beck, A.T., Rush, A.J., Shaw, B.E. ve Emery, G. (1979). *Cognitive therapy of depression*. New York: The Guilford Press.
- Beck, A.T., Ward, C.H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561-571.
- Beck, J.S. (2011). *Cognitive behavior therapy: Basics and beyond*. Guilford Press.
- Bilgin, M. (2009). Bilişsel esnekliği yordayan bazı değişkenler. *Çukurova Üniversitesi Eğitim Fakültesi Dergisi, 3*(36), 142-157.
- Campbell-Sills, L., & Barlow, D.H. (2006). Incorporating emotion regulation into conceptualizations and treatments of anxiety and mood disorders. In J.J. Gross (Ed.), *Handbook of Emotion Regulation* (pp.542-559). New York: Guilford Press.
- Chamberlain, S.R., Fineberg, N.A., Blackwell, A.D., Robbins, T.W., & Sahakian, B.J. (2006). Motor inhibition and cognitive flexibility in obsessive-compulsive disorder and trichotillomania. *American Journal of Psychiatry, 163*(7), 1282-1284.
- Coşkun, Y.D., Garipağaoğlu, Ç., & Tosun, Ü. (2014). Analysis of the relationship between the resiliency level and problem solving skills of university students. *Procedia-Social and Behavioral Sciences, 114*, 673-680.
- Cyranowski, J.M., Frank, E., Young, E., & Shear, M.K. (2000). Adolescent onset of the gender difference in lifetime rates of major depression: A theoretical model. *Archives of General Psychiatry, 57*(1), 21-27.
- Dağ, İ., & Gülüm, V. (2013). Yetişkin bağlanma örüntüleri ile psikopatoloji belirtileri arasındaki ilişkide bilişsel özelliklerin aracı rolü: Bilişsel esneklik. *Türk Psikiyatri Dergisi, 24*(4), 240-247.

- Daly, E.J., Trivedi, M.H., Wisniewski, S.R., Nierenberg, A.A., Gaynes, B.N., Warden, D., ... & Rush, A.J. (2010). Health-related quality of life in depression: A STAR* D report. *Annals of Clinical Psychiatry*, 22(1), 43-55.
- Dennis, J.P., & Vander Wal, J.S. (2010). The Cognitive Flexibility Inventory: Instrument development and estimates of reliability and validity. *Cognitive Therapy and Research*, 34(3), 241-253.
- Deveney, C.M., & Deldin, P.J. (2006). A preliminary investigation of cognitive flexibility for emotional information in major depressive disorder and non-psychiatric controls. *Emotion*, 6(3), 429-437.
- Edward, K.L. (2005). Resilience: A protector from depression. *Journal of the American Psychiatric Nurses Association*, 11(4), 241-243.
- Ehring, T., Tuschen-Caffier, B., Schnulle, J., Fischer, S., & Gross, J.J. (2010). Emotion regulation and vulnerability to depression: spontaneous versus instructed use of emotion suppression and reappraisal. *Emotion*, 10(4), 563-572.
- Fredrickson, B.L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition & Emotion*, 19(3), 313-332.
- Genet, J.J., Malooly, A.M., & Siemer, M. (2013). Flexibility is not always adaptive: Affective flexibility and inflexibility predict rumination use in everyday life. *Cognition & Emotion*, 27(4), 685-695.
- Gratz, K.L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, 26(1), 41-54.
- Greenberg, L.S. (2004). Emotion-focused therapy. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice*, 11(1), 3-16.
- Gross, J.J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271-299.
- Gülüm, İ.V., & Dağ, İ. (2012). Tekrarlayıcı Düşünme Ölçeği ve Bilişsel Esneklik Envanterinin Türkçeye uyarlanması, geçerliliği ve güvenilirliği. *Anadolu Psikiyatri Dergisi*, 13(3), 216-223.
- Hayes, A.F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Press.
- Hayes, S.C., Luoma, J.B., Bond, F.W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, 44(1), 1-25.
- Hayes, S.C., Strosahl, K.D., & Wilson, K.G. (2012). *Acceptance and commitment therapy: The process and practice of mindful change*. Guilford Press.
- Heppner, P.P., & Petersen, C.H. (1982). The development and implications of a personal problem-solving inventory. *Journal of Counseling Psychology*, 29(1), 66-75.

- Hildebrandt, L.K., McCall, C., Engen, H.G., & Singer, T. (2016). Cognitive flexibility, heart rate variability and resilience predict fine-grained regulation of arousal during prolonged threat. *Psychophysiology*, *53*(6), 880-890.
- Hisli, N. (1989). Beck Depresyon Envanterinin üniversite öğrencileri için geçerliği, güvenilirliği. *Psikoloji Dergisi*, *7*(23), 3-13.
- Johnson, S.M., & Denton, W. (2002). Emotionally focused couple therapy: Creating secure connections. In A.S. Gurman & N.S. Jacobson (Eds.). *Clinical Handbook of Couple Therapy* (pp.221-250). New York: Guilford Press.
- Kaiser, T., Herzog, P., Voderholzer, U., & Brakemeier, E.L. (2021). Unraveling the comorbidity of depression and anxiety in a large inpatient sample: Network analysis to examine bridge symptoms. *Depression and Anxiety*, *38*(3), 307-317.
- Kang, H.J., Kim, S.Y., Bae, K.Y., Kim, S.W., Shin, I.S., Yoon, J.S., & Kim, J.M. (2015). Comorbidity of depression with physical disorders: Research and clinical implications. *Chonnam Medical Journal*, *51*(1), 8-18.
- Katon, W.J. (2003). Clinical and health services relationships between major depression, depressive symptoms, and general medical illness. *Biological Psychiatry*, *54*(3), 216-226.
- Kendler, K.S., Thornton, L.M., Prescott, C.A. (2001). Gender differences in the rates of exposure to stressful life events and sensitivity to their depressogenic effects. *American Journal of Psychiatry*, *158*, 587-593.
- Krems, J.F. (1995). Cognitive flexibility and complex problem solving. *Complex problem solving: The European Perspective*, pp.201-218.
- Kring, A.M., & Werner, K.H. (2004). Emotion regulation and psychopathology. In P. Philippot & R.S. Feldman (Eds.), *The regulation of emotion* (pp.359-385). Mahwah, NJ: Erlbaum.
- Kring, A.M. & Sloan, D.M. (Eds.). (2009). *Emotion regulation and psychopathology: A transdiagnostic approach to etiology and treatment*. Guilford Press.
- Malooly, A.M., Genet, J.J., & Siemer, M. (2013). Individual differences in reappraisal effectiveness: The role of affective flexibility. *Emotion*, *13*(2), 302-313.
- McTernan, W.P., Dollard, M.F., & LaMontagne, A.D. (2013). Depression in the workplace: An economic cost analysis of depression-related productivity loss attributable to job strain and bullying. *Work & Stress*, *27*(4), 321-338.
- Min, J.A., Yu, J.J., Lee, C.U., & Chae, J.H. (2013). Cognitive emotion regulation strategies contributing to resilience in patients with depression and/or anxiety disorders. *Comprehensive Psychiatry*, *54*(8), 1190-1197.
- Nezu, A.M., & Ronan, G.F. (1985). Life stress, current problems, problem solving, and depressive symptoms: An integrative model. *Journal of Consulting and Clinical Psychology*, *53*(5), 693-697.
- Palm, K.M., & Follette, V.M. (2011). The roles of cognitive flexibility and experiential avoidance in explaining psychological distress in survivors of interpersonal

- victimization. *Journal of Psychopathology and Behavioral Assessment*, 33(1), 79-86.
- Radkovsky, A., McArdle, J.J., Bockting, C.L., & Berking, M. (2014). Successful emotion regulation skills application predicts subsequent reduction of symptom severity during treatment of major depressive disorder. *Journal of Consulting and Clinical Psychology*, 82(2), 248-262.
- Rugancı, R.N., & Gençöz, T. (2010). Psychometric properties of a Turkish version of the Difficulties in Emotion Regulation Scale. *Journal of Clinical Psychology*, 66(4), 442-455.
- Ruiz, F.J. (2010). A review of acceptance and commitment therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. *International Journal of Psychology & Psychological Therapy*, 10(1), 125-162.
- Schaeuffele, C., Bär, J., Buengener, I., Grafiadeli, R., Heuthaler, E., Strieder, J., ... & Boettcher, J. (2022). Transdiagnostic processes as mediators of change in an internet-delivered intervention based on the unified protocol. *Cognitive Therapy and Research*, 46(2), 273-286.
- Sahin, N., Sahin, N.H., & Heppner, P.P. (1993). Psychometric properties of the Problem Solving Inventory in a group of Turkish university students. *Cognitive Therapy and Research*, 17(4), 379-396.
- Shamay-Tsoory, S.G., Tomer, R., Berger, B.D., & Aharon-Peretz, J. (2003). Characterization of empathy deficits following prefrontal brain damage: The role of the right ventromedial prefrontal cortex. *Journal of Cognitive Neuroscience*, 15(3), 324-337.
- Stevens, A.D. (2009). Social problem-solving and cognitive flexibility: Relations to social skills and problem behavior of at-risk young children (Doctoral thesis). Available from Proquest Dissertations and Theses database. (UMI No. 3359050).
- Tchanturia, K., Davies, H., Roberts, M., Harrison, A., Nakazato, M., Schmidt, U., ... & Morris, R. (2012). Poor cognitive flexibility in eating disorders: Examining the evidence using the Wisconsin Card Sorting Task. *PloS one*, 7(1), e28331.
- Viskovich, S., & Pakenham, K.I. (2018). Pilot evaluation of a web-based acceptance and commitment therapy program to promote mental health skills in university students. *Journal of Clinical Psychology*, 74(12), 2047-2069.
- Wang, T., Li, M., Xu, S., Liu, B., Wu, T., Lu, F., ... & Wang, J. (2019). Relations between trait anxiety and depression: A mediated moderation model. *Journal of Affective Disorders*, 244, 217-222.
- Whiting, D.L., Deane, F.P., Simpson, G.K., McLeod, H.J., & Ciarrochi, J. (2017). Cognitive and psychological flexibility after a traumatic brain injury and the implications for treatment in acceptance-based therapies: A conceptual review. *Neuropsychological Rehabilitation*, 27(2), 263-299.

- Yazar, M.S., & Meterelliyoz, K.Ş. (2019). Klinik olmayan populusyonda depresif semptomatoloji, bilişsel esneklik ve umutsuzluk ilişkisinin incelenmesi. *Bilişsel Davranışçı Psikoterapi ve Araştırmalar Dergisi*, 8(2), 155-163.
- Young, J.E., Weinberger, A.D., & Beck, A.T. (2001). *Cognitive therapy for depression*. In D.H. Barlow (Ed.), *Clinical handbook of psychological disorders: A step-by-step treatment manual* (3rd ed., pp. 264-308). New York: Guilford Press.
- Zarei, M., Momeni, F., & Mohammadkhani, P. (2018). The mediating role of cognitive flexibility, shame and emotion dysregulation between neuroticism and depression. *Iranian Rehabilitation Journal*, 16(1), 61-68.