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Research Article

# General Self-Efficacy and Forgiveness of Self, Others, and Situations as Predictors of Depression, Anxiety, and Stress in University Students

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## Abstract

The aim of this study was to examine the relationships between three factors—depression, anxiety, and stress—with general self-efficacy and forgiveness of the self, others, and situations. A convenience sample of 542 students (335 females, 207 males) was recruited from a university in the Central Black Sea Region of Turkey. Participants responded to the Heartland Forgiveness Scale, Generalized Self-Efficacy Scale, Depression Anxiety Stress Scales (DASS-42), and a personal information form to determine their forgiveness, self-efficacy, depression, anxiety and stress levels, as well as their socio-demographics. Data were analyzed using Pearson correlation analysis and multivariate multiple regression analysis. The results of this study suggested that forgiveness of self and situations were negatively associated with depression, anxiety, and stress symptoms. However, forgiveness of others and general self-efficacy were not significant predictors of depression, anxiety, or stress. Mental health practitioners should focus on increasing their clients' forgiveness levels to help them cope effectively with negative affectivity symptoms including depression, anxiety, and stress in university students.

## Keywords

Depression • Anxiety • Stress • Self-efficacy • Forgiveness of self • Forgiveness of others • Forgiveness of situations • University students

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Psychological distress refers to an emotional state characterized by symptoms of anxiety, stress, and/or depression (Sun et al., 2016). Recent research has suggested that university students are exposed to different kinds of difficulties that can lead to high psychological distress as well as certain problems in academic, emotional, economic, and social areas (Hunt & Eisenberg, 2010; Koydemir, Erel, Yumurtaci, & Şahin, 2010). Indeed, various studies have revealed depression, anxiety, and stress to be common mental health problems among university students (Mahmoud, Staten, Hall, & Lennie, 2012; Sahoo & Khess, 2010; Zivin, Eisenberg, Gollust, & Golberstein, 2009), and recent estimates suggest that approximately one out of every ten university students experiences anxiety or mood disorder symptoms (Blanco et al., 2008). Studies have shown that mental health problems such as depression, anxiety, and stress can negatively affect quality of life, socio-economic well-being, education, and job satisfaction (Lund et al., 2010). Unfortunately, studies have also shown that 67.1% of individuals with major depression and 73.1% of individuals with anxiety disorder have not received any treatment in the past year (Wang et al., 2005). Taking into account the prevalence of anxiety and mood disorders and their related adverse consequences, it is important to identify the factors that might negatively affect an individual's possibility of experiencing anxiety and mood disorders as well as those that function as protective factors among diverse populations.

Although depression, anxiety, and stress are often cited together and share some common symptoms, they are considered to be different. Available evidence consistently suggests that depression, anxiety, and stress highly and positively correlate with each other, but their causes and manifestations differ (Lovibond & Lovibond, 1995). Nevertheless, the sociodemographic correlates of depression, anxiety, and stress have been frequently investigated in the literature. Closer examination of these studies shows that depression, anxiety, and stress are related to gender and age; however, the findings have been inconsistent. Recent findings suggest older people to be more prone to depression than the young, and women are more likely to be more depressed than men (Andrade et al., 2003; Kessler & Bromet, 2013; Van de Velde, Bracke, & Levecque, 2010). In a recent survey conducted with university students, Wahed and Hassan (2017) found that women and older students were more likely to have higher levels of stress and anxiety than younger and male students, but older people were more likely to have higher levels of depression than younger students. In addition to the sociodemographic correlates of depression, anxiety, and stress, researchers have also focused on the antecedents, correlates, and consequences of these symptoms of negative affectivity. Symptoms of depression, anxiety, and stress have long been recognized to push people to find ways to cope effectively with them and forgiveness to be an important factor in understanding the onset and maintenance of psychological problems as well as one of the sources of coping with negative affectivity (Strelan & Wojtysiak, 2009).

Many different definitions exist for the concept of forgiveness, but few are generally agreed upon by scholars. The first is that forgiveness should be defined as a decrease in negative feelings, thoughts, and behaviors towards a transgressor, or a change from negative-to-neutral or negative-to-positive feelings. Second, forgiveness is an increase in positive emotions following interpersonal guilt towards a transgressor (Rye & Pargament, 2002; Worthington & Wade, 1999). According to Enright and The Human Development Study Group (1996), forgiveness can be described as a change of emotion in the sense that the individual abandons one's feelings of anger, negative judgment, and disinterest, instead transforming them into feelings such as love, generosity, and compassion towards the offender.

Although no consensus exists about how to conceptualize the concept of forgiveness in the literature, according to Thompson et al. (2005), forgiveness can be classified as forgiveness of self, others, and situations. Historically, self-forgiveness has not been explored as extensively as the concept of forgiveness of others because of quantitative and conceptual difficulties (Davis et al., 2015; Wohl, DeShea, & Wahkinney, 2008). Self-forgiveness is an emotion-focused coping strategy that involves abandoning one's negative thoughts, feelings, and behaviors and replacing them with positive ones such as self-directed compassion and love (Hall & Fincham, 2008). The process of self-forgiveness seems to involve three necessary and consecutive stages that can help people reduce the self-blame associated with past mistakes, regrets, or wrongdoings. These are acceptance of the transgressor's wrongdoings, taking responsibility, and finally having a useful motivational change that reduces negative feelings and behaviors such as guilt, self-judgment, and self-indulgence while increasing feelings of self-acceptance, self-esteem, and self-compassion (Exline & Fisher, 2006; Hall & Fincham, 2005).

Self-forgiveness can serve as a catalyst for personal development. For example, in a sample of university students whose romantic relationships experienced an unwanted end, Wohl et al. (2008) found that feelings, actions, and beliefs related to self-forgiveness can mediate between self-blame and depression. When individuals are better able to forgive themselves, they feel less guilt and fewer depressive symptoms. According to Wohl et al. (2008), when people forgive themselves, their self-related emotions, behaviors, and beliefs become more positive; for example, people start to love themselves, thus, they become less self-deprecating and feel they deserve compassion from others. Consequently, these positive attitudes towards the self can help to reduce the level of depression.

Forgiveness of others can be described as abandoning the feelings of blame, condemnation, and revenge against the transgressor while also strengthening feelings such as compassion, generosity, and even love for that undeserving person (Enright & The Human Development Study Group, 1996). Forgiveness of others is seen as

a coping mechanism. Frankel (1998) states that in order to forgive the person who has acted unjustly, some steps need to be taken against the transgressor such as (1) being aware that one has behaved wrongly, (2) expressing clear regret, (3) expressing that the offense will not be repeated, and finally (4) making restitution. Therefore, forgiving others is a process that requires various acts. As a result, forgiving others neutralizes negative emotions and can positively impact mental health. Forgiving others is found to relate to both physical and mental health. For example, Webb, Toussaint, and Conway-Williams (2012) examined 54 recently published studies (i.e., 44 correlational, 9 intervention, and 1 experimental) and found out at least one beneficial effect of forgiving others on over 100 different outcomes related to physical health, mental health, spiritual well-being, and substance abuse.

Finally, forgiveness of the situation involves forgiving situations beyond one's control, such as a disease or natural disasters. Thompson et al. (2005) found that forgiveness of situations was associated with psychological well-being (e.g., less anger, anxiety, depression, as well as greater life satisfaction), including more forgiveness of the self and others. Several studies have shown that individuals with high levels of situational forgiveness and for whom the ability to forgive was a personality trait to generally only experience mild depression and anxiety symptoms and decreased physical responsiveness, and they have healthier and higher levels of psychological well-being (Lawler et al., 2005; McCullough, Bellah, Kilpatrick, & Johnson, 2001).

The relationship between mental health and forgiveness has become a topic of increasing interest among researchers (Maltby, Day, & Barber, 2004; Reed & Enright, 2006; Thompson et al., 2005), and forgiveness has been studied from various perspectives ranging from physical disorders (Lawler et al., 2005) to psychological problems (Maltby et al., 2004; Thompson et al., 2005). Previous studies have shown that forgiveness is related to improvement and consistence of interpersonal relations (McCullough et al., 1998; McCullough, Worthington, & Rachal, 1997), as well as physical and psychological well-being (Lin, Enright, & Klatt, 2011). On the other hand, previous studies also indicate that inability to forgive can lead to high levels of depression, anxiety, and stress in the individual (Fu, Watkins, & Hui, 2004; Orcutt, 2006). In a longitudinal study conducted with female undergraduate students, Orcutt (2006) found that offense-specific forgiveness negatively correlate with symptoms of psychological distress (depression, anxiety, and stress). However, very few empirical studies conducted to examine how different types of forgiveness relate to mental health problems.

Various contemporary researchers have tried to integrate different approaches with forgiveness therapy as forgiveness has a potentially beneficial effect on mental health. One of these approaches is rational emotional behavioral therapy (REBT). Especially in the working phase of forgiveness therapy, the aim is to provide the client with a

cognitive understanding related to the offender, thus restructuring the client's perception of the person to be forgiven (McKay, Hill, Freedman, & Enright, 2007).

In addition to different types of forgiveness, one personality characteristic that can help an individual to deal with negative affectivity is self-efficacy. People with high self-efficacy are known to be more dynamic in facing aversive experiences or obstacles and demonstrate effective strategies for coping with stress (Pajares, 2002). According to Bandura (1977), self-efficacy is defined as the belief that an individual can perform certain tasks in a specific order to achieve desired outcomes. According to this definition, the individual's self-directed competence and outcome expectation are fundamental determinants of the individual's self-efficacy. The perception of self-efficacy for performing a task is often considered to be related to behavioral outcomes and have a direct effect on behaviors. The level of self-efficacy is related to how the individual can recover and go on in the event of a possible failure (Bandura, 1997).

Self-efficacy levels may be associated with depression, anxiety, and stress (Ghaderi & Rangaiah, 2011; Tahmassian & Moghadam, 2011). In a study with university students, Ghaderi and Rangaiah (2011) found that those with low self-efficacy were more likely to have higher levels of depression and stress compared to those who have high self-efficacy. However, relatively little empirical research exists regarding how depression, anxiety, and stress relate to self-efficacy in the presence of other variables such as forgiveness.

Forgiveness, which is regarded as a phenomenon that transcends history and culture, is also a source of a number of positive influences that can help individuals to effectively deal with interpersonal problems (Fehr, Gelfand, & Nag, 2010). According to Worthington and Scherer (2004), unforgiveness is one of the major stressors in an individual's life. On the other hand, forgiveness is an effective coping mechanism that can be used to deal with this stressful situation. Self-efficacy and forgiveness are generally considered to help alleviate depressive tendencies that result from negative events and situations at work and daily life, as well as increasing the ability to adapt to and cope with stress and anxiety-inducing life events. Although forgiveness is consistently associated with better psychological functioning, few studies have simultaneously examined the impact of gender, age, self-efficacy, and the different dimensions of forgiveness on depression, anxiety, and stress. Moreover, studies examining forgiveness have mostly focused on forgiveness of others. Therefore, the aim of this study is to investigate the roles of gender, age, self-efficacy, and the different dimensions of forgiveness on depression, anxiety, and stress.

## Method

### Research Design

A correlational research design was used in this study. Gender, age, self-efficacy, forgiveness of the self, others, and situations were investigated as predictors of depression, anxiety, and stress symptoms in university students.

### Participants

The participants consisted of 542 students continuing undergraduate or graduate programmes at a mid-sized state university in the Central Black Sea Region of Turkey. Students were recruited for this study using convenience sampling. There were 335 (62%) female and 207 (38%) male students. The age of the students ranged from 18 to 35 ( $M = 23.30$ ;  $SD = 3.08$ ). With regard to educational level, 47 (8.7%) were freshmen, 73 (13.5%) were sophomores, 52 (9.5%) were juniors, 221 (40.8%) were seniors, and 149 (27.5%) were graduate students. The participants were from the Faculties of Engineering (13.7%,  $n = 74$ ), Arts and Sciences (6.5%,  $n = 35$ ), Education (55%,  $n = 298$ ), Economics and Administrative Sciences (9.8%,  $n = 53$ ), and Agriculture (15%,  $n = 82$ ).

### Measures

**Personal Information Form.** Participants were asked to give information about their gender, age, grade level, and faculty on this form.

**Forgiveness.** The Heartland Forgiveness Scale (HFS), developed by [Thompson et al. \(2005\)](#), was used to measure students' dispositional forgiveness levels. The Turkish adaptation, validity, and reliability of the HFS were carried out in two different studies by [Bugay and Demir \(2010\)](#) and [Bugay, Demir, and Delevi \(2012\)](#) on university students. [Thompson et al. \(2005\)](#) reported that the HFS was composed of a 3-factor structure: forgiveness of self, forgiveness of others, and forgiveness of situations. [Thompson et al. \(2005\)](#) also found that the HFS total scores were positively correlated with cognitive flexibility and positive affect and negatively correlated with rumination, hostility, and vengeance. In line with the original study, Bugay and colleagues ([Bugay & Demir, 2010](#); [Bugay et al., 2012](#)) reported a good fit to data for the 3-factor structure in Turkish university students. The confirmatory factor analyses goodness of fit indexes of the HFS's construct validity for the 3-factor structure reported were as follows: the ratio of chi-square to its degree of freedom ( $\chi^2/df$ ): 2.33; Root Mean Square Error of Approximation (RMSEA): .06; Comparative Fit Index (CFI): .90; Goodness of Fit Index (GFI): .92 in [Bugay and Demir \(2010\)](#); while  $\chi^2/df$ : 2.65; RMSEA: .04; CFI: .97; GFI: .96; Standardized Root Mean Square Residual (SRMR): .03 in [Bugay et al. \(2012\)](#). [Bugay and Demir \(2010\)](#) also reported good convergent

and divergent validity estimates, similar to those in the original study, such that the HFS total scores were positively correlated with life satisfaction scores and negatively correlated with rumination scores. The HFS consists of three 6-item subscales aiming to measure forgiveness in terms of forgiveness of self, forgiveness of others, and forgiveness of situations. Each item of the HFS is rated on a 7-point Likert-type scale ranging from *Almost Always False of Me* (1) to *Almost Always True of Me* (7). Nine items on the HFS are related to the inability to forgive and are reverse scored. Scores can range from 6 to 42 for each subscale. Higher scores reflect greater forgiveness in each dimension. Bugay and Demir (2010) reported Cronbach's alpha internal consistency coefficients as .64, .79, and .76 for the subscales of forgiveness of self, forgiveness of others, and forgiveness of situations, respectively. Cronbach's alpha internal consistency coefficients calculated for this study were .50 for forgiveness of self, .73 for forgiveness of others and .63 for the forgiveness of situations subscale. A sample item from the forgiveness of self subscale is "Although I feel badly at first when I mess up, over time I can give myself some slack." A sample item from the forgiveness of others subscale is "Although others have hurt me in the past, I have eventually been able to see them as good people." A sample item from forgiveness of situations subscale is "I eventually make peace with bad situations in my life."

**Depression Anxiety Stress.** The Depression Anxiety Stress Scale-42 (DASS-42) developed by Lovibond and Lovibond (1995) was employed to measure students' depression, anxiety, and stress symptoms. The Turkish adaptation, validity, and reliability of the DASS-42 were performed by Bilgel and Bayram (2010). They examined its construct validity using confirmatory factor analysis and found an acceptable fit to data for the 3-factor structure as suggested by Lovibond and Lovibond (1995) for Turkish university students ( $\chi^2/df$ : 3.17, RMSEA: .04, CFI: .92, GFI: .90). DASS-42 consists of three subscales, each with 14 items, for measuring depression, anxiety, and stress symptoms. Participants answer each item in the DASS-42, taking into account the severity of their depression, anxiety, and stress symptoms during the last seven days using a 4-point Likert-type scale ranging from *Did not apply to me at all* (0) to *Applied to me very much, or most of the time* (3). The scores that can be obtained from each subscale range from 0 to 42. Higher scores indicate more severe depression, anxiety, and stress symptoms for the depression, anxiety, and stress subscales, respectively. Cronbach's alpha internal consistency coefficients reported by Bilgel and Bayram (2010) were .92, .86, and .88 for the depression, anxiety and stress subscales, respectively. Cronbach's alpha internal consistency coefficients calculated for the depression, anxiety, and stress subscales in this study were .92, .90, and .91, respectively. A sample item from the depression subscale is "I felt I wasn't worth much as a person." A sample item from the anxiety subscale is "I felt scared without any good reason." A sample item from the stress subscale is "I found it difficult to relax."

**General Self-Efficacy.** The Generalized Self-Efficacy Scale (GSES) developed by Schwarzer and Jerusalem (1995), was used to assess students' self-efficacy levels. The GSES measures the belief that individuals are capable of coping with new and challenging tasks and with challenging environments. The scale was originally developed in Germany and has been translated into more than 30 languages including Turkish as part of an international project (Scholz, Doña, Sud, & Schwarzer, 2002). The Turkish translation, validity, and reliability of the GSES were carried out by several researchers (Aypay, 2010; Uysal, 2013; Yeşilay, Schwarzer, & Jerusalem, 1996). However, mixed support emerged regarding the GSES factor structure in the Turkish studies. While some studies confirmed the original 1-factor structure (Uysal, 2013; Yeşilay et al., 1996), others suggested a 2-factor solution (Aypay, 2010) using exploratory factor analysis or principal component analysis. Given this mixed evidence in previous studies, using Yeşilay et al.'s (1996) translation, we tested the factor structure of the GSES responses through confirmatory factor analysis (CFA). CFA is more appropriate when researchers try to test and evaluate alternative competing models for explaining the underlying factor structure of a scale, as in this study (Brown, 2015). CFAs were performed using the mean and variance adjusted maximum likelihood estimation method (MLMV) as implemented in the Mplus 7.4 program (Muthén & Muthén, 1998-2012). MLMV estimation produce maximum likelihood parameter estimates with standard errors and a mean- and variance-adjusted chi-square test statistic that are robust to non-normality (Muthén & Muthén, 1998-2012). Three competing models were tested in this study: a 1-factor model in which all GSES items were related to the general self-efficacy latent factor (Model 1); a 1-factor model with correlated error terms that permits item residuals to be correlated and justified by previous research or substantive values (Model 2); and a 2-correlated factor model based on Aypay's (2010) study, which posits that all GSES items are related to two correlated latent factors, the first of which consists of six GSES items (Items 3, 4, 5, 7, 8, and 10), whereas the second latent factor is composed of four GSES items (Items 1, 2, 6, and 9; Model 3).

Although no absolute standards exist for determining model fit to data in CFA, a number of fit indices are frequently used to provide evidence of acceptable and good fit to the data. We used the following goodness of fit indexes to evaluate congruence between the competing models and data:  $\chi^2/df$ , CFI, Tucker-Lewis Index (TLI), RMSEA with a 90% confidence interval, and Akaike Information Criterion (AIC). A  $\chi^2/df$  ratio less than 5 and 3 indicates acceptable and excellent fit to data respectively. CFI and TLI values typically vary from 0 to 1. Values greater than .90 and .95 indicate acceptable and excellent fit to data respectively. RMSEA values less than .08 and .05 indicate reasonable and good fit to data respectively (Dattalo, 2013). Unlike other goodness of fit indexes, since the confidence intervals for RMSEA can be calculated, it can be tested whether RMSEA significantly differs from .05 (Wang & Wang, 2013).



An insignificant probability value ( $p > .05$ ) suggests that the RMSEA does not differ significantly from .05, or the specified model has a close fit to data. Lastly, the model with the lowest AIC value is considered to be best fitting model to data.

A number of CFAs were performed to examine goodness of fit for the competing models to the sample data. CFA results for Model 1 suggested that the model had acceptable fit ( $\chi^2$  (35): 161.572,  $\chi^2/df$ : 4.616, CFI: .926, TLI: .904, RMSEA: .082,  $p < .001$ , RMSEA: 90% [.069, .095], AIC: 11598.617). However, consistent with previous research (Crandall, Rahim, & Yount, 2016), examination of local fit via normalized residual covariances and modification index in Model 1 suggested that there were some systematic residual covariations among the responses to GSES items. Specifically, Item 1 (I can always manage to solve difficult problems if I try hard enough.) and Item 2 (If someone opposes me, I can find the means and ways to get what I want.) of the GSES share similar semantics and related to the problem-solving aspects of self-efficacy. Thus, we estimated Model 2 by adding correlated errors between Items 1 and 2. The results of the CFA suggested that Model 2 had excellent fit ( $\chi^2$  (34): 92.475,  $\chi^2/df$ : 2.720, CFI: .966, TLI: .954, RMSEA: .056  $p > .05$ , RMSEA: 90% [.043, .070], AIC: 11497.451). Lastly, the CFA results for the 2-factor model (Model 3) found that the model had acceptable fit ( $\chi^2$  (34): 160.056,  $\chi^2/df$ : 4.708, CFI: .926, TLI: .902, RMSEA: .083,  $p < .001$ , RMSEA: 90% [.070, .096], AIC: 11598.497). Compared to Model 1 and 2, Model 3 did not improve the model data fit. Moreover, the two factor solutions were very strongly correlated with to each other ( $r = .974$ ), indicating a general higher order GSES factor. Overall, the CFA findings suggested that the GSES factor structure was best represented by a single factor structure with correlated errors for Items 1 and 2 in this data. All standardized factor loadings were large and statistically significant at least at the .001 level in Model 2. Standardized item factor loadings ranged from .56 to .78, with  $z$ -values ranged from 17.44 to 38.04.

The GSES is composed of 10 items, and respondents rate their agreement level to each item on a 4-point Likert-type scale ranging from *Not at all true* (1) to *Exactly true* (4). Possible scores on the GSES range from 10 to 40. Higher scores are associated with greater levels of self-efficacy. The internal consistency coefficient (Cronbach's alpha) calculated for this study was .90.

## Procedure

The data collection in this study was carried out between April and June 2016. Administration of the paper and pencil questionnaire was performed by the researchers in a classroom environment before/after regular class hours based on the course instructor's preference. All research procedures conform to the Declaration of Helsinki for Human Subjects or its later Amendments. All students gave written

consent before proceeding to fill in the questionnaire. The students were informed that participation in the survey was voluntary, the answers would be confidential, the data would only be used for research purposes, and they could withdraw from the study without any negative repercussions. Students did not receive any incentive for participating the study, and all students voluntarily participated to the research. Participants completed the questionnaires in approximately 30 minutes.

### Statistical Analysis

All main statistical analyses were carried out using IBM SPSS Statistic for Windows v.23 and Stata 14.2 (StataCorp LP, 2015). Preliminary analyses were performed to screen data as suggested by Tabachnick and Fidell (2014). Data were screened for accuracy, missing values, univariate and multivariate outliers as well as the assumptions of used statistical analyses. The examinations of minimum and maximum values as well as frequency distributions suggested that all values for independent and dependent variables were within the expected range, thereby verifying the accuracy of the data. Fifteen participants with excessive missing values on questionnaires were excluded from the dataset. No univariate outliers were found in the dataset using  $z$ -scores as a criterion (Hair, Black, Babin, & Anderson, 2014). Multivariate outliers were determined by calculating Mahalanobis distances as recommended by Tabachnick and Fidell (2014), and four multivariate outliers were discarded from the dataset. In order to examine the univariate normality assumption, we first performed a series of Kolmogorov-Smirnov normality tests with Lilliefors significance correction, and then skewness and kurtosis values and histograms and normal Q-Q plots for continuous variables were examined by taking into account the sample size. The Kolmogorov-Smirnov normality test compares sample scores with an artificial set of normally distributed scores that have the same mean and standard deviation as the sample data (Sarstedt & Mooi, 2014). Although normality tests are efficient at helping researchers assess normality assumption, normality tests are so sensitive that the results of a normality test tend to be significant in large samples even with minor deviations from normality as in this study (Pallant, 2013; Tabachnick & Fidell, 2014). As expected, all Kolmogorov-Smirnov test results were significant for all continuous variables including depression ( $D(542) = .12, p < .001$ ), anxiety ( $D(542) = .10, p < .001$ ), stress ( $D(542) = .06, p < .001$ ), age ( $D(542) = .17, p < .001$ ), self-efficacy ( $D(542) = .05, p < .01$ ), forgiveness of self ( $D(542) = .06, p < .001$ ), forgiveness of others ( $D(542) = .05, p < .001$ ), and forgiveness of situations ( $D(542) = .08, p < .001$ ). Researchers are recommended to evaluate normality assumption using skewness and kurtosis values as well as graphical approaches with large sample sizes (Pallant, 2013; Tabachnick & Fidell, 2014). Inspection of the skewness and kurtosis values and histograms and normal Q-Q graphics suggested that all values were within acceptable ranges and data was approximately normally distributed for each continuous variable (George & Mallery, 2016).

Pearson correlation analysis is used to measure the strength and direction of the associations among all variables. Multivariate multiple regression analysis is employed to examine the best linear combination of the predictor variables of depression, anxiety, and stress. Multivariate multiple regression analysis is a multivariate extension of standard linear multiple regression analysis and is used when the dependent variable is greater than one and the dependent variables are correlated with each other. This analysis enables researchers to examine the relationship of all independent variables to all dependent variables as a whole, as well as allowing for the examination of the independent variables' association with each dependent variable separately. Multivariate multiple regression analysis provides the same unstandardized and standardized beta coefficients, standard errors,  $p$  values, and confidence intervals that can be taken from traditional multiple regression analysis performed separately for each dependent variable (Dattalo, 2013). However, multivariate multiple regression analysis is widely used by researchers as it allows one to compare the beta coefficients across regression equations with respect to the dependent variables and also permits the multivariate main effect to be tested when the dependent variables are associated with each other, as in this study. In addition to univariate normality, preliminary analyses were also conducted to ensure there was no violation of the assumptions of multivariate normality, linearity, normality of residuals, homoscedasticity, and multicollinearity in the relevant analyses. The multivariate normality assumption was examined by using scatter-plot matrices and inspecting that the shapes of the scatter-plot matrices displayed close to elliptical shapes, which indicates the multivariate normality assumption was tenable. Linearity assumption was also examined by creating scatter-plots for all combinations of the variables prior to the Pearson correlation analysis. Inspection of scatter-plots suggested that there was a straight line relationship between the variables, thereby confirming the linearity assumption. The normality-of-residuals assumption was investigated using the regression residuals for depression, anxiety, and stress models respectively. The respective inspections of the depression, anxiety, and stress regression residuals using normal P-P plots suggested that residuals of depression, anxiety and stress scores were approximately normally distributed. The assumption of homoscedasticity examined by constructing standardized regression scatter-plots for the depression, anxiety, and stress models. Specifically, standardized regression residuals and the standardized predicted values of regression were used to construct regression scatter-plots. Inspections of the standardized regression scatter-plots also suggested that homoscedasticity was not present in the depression, anxiety, or stress regression models. Lastly, in order to examine the assumption of multicollinearity, the variance inflation factor (VIF) for the depression, anxiety, and stress regression models was examined. As a general rule, a VIF less than 10 indicates that multicollinearity is not a problem in the regression model (Sarstedt & Mooi, 2014). Examinations of the

VIF values also suggested that multicollinearity was not a problem in the depression, anxiety, or stress regression models. Consequently, preliminary analyses showed that there were no major violations of the Pearson correlation analysis or multivariate multiple regression analysis assumptions. Data used in this study is accessible from the Open Science Framework (<https://osf.io/z24pk/>).

Statistical analyses were reported with effect size estimates that provide information about the practical significance of the results. The effect size used in the Pearson correlation analysis is the correlation coefficient ( $r$ ), while the proportion of variance accounted for by the regression model ( $R^2$ ) for regression analysis. According to Cohen (1992), absolute correlation coefficient values ( $r$ ) between .00 to .29 indicate low, values from .30 to .49 indicate medium, values from .50 to .69 indicate large, and .70 or greater indicate very large effect size. The proportion of variance accounted for by the regression model ( $R^2$ ) values below .12 indicate low, values between .13 and .25 indicate medium, and values above .26 indicate large effect size. In order to effectively control the Type-I error rate, a two-tailed significance level of  $p < .01$  was used for all statistical analyses.

## Results

Table 1 shows the means, standard deviations, and correlations among the variables of interest. As shown in Table 1, depression scores were not related to gender ( $r = .00, p > .01$ ) or age ( $r = -.10, p > .01$ ). However, significant weak and negative correlations were found for depression scores with self-efficacy scores ( $r = -.24, p < .001$ ) and depression scores with forgiveness of others scores ( $r = -.12, p < .01$ ). Depression scores also moderately and negatively correlated with forgiveness of self scores ( $r = -.33, p < .001$ ) and forgiveness of situations scores ( $r = -.39, p < .001$ ). Anxiety scores were not associated with gender ( $r = .04, p > .01$ ), age ( $r = -.08, p > .01$ ) or forgiveness of others scores ( $r = -.05, p > .01$ ). However, anxiety scores were weakly and negatively correlated with the self-efficacy scores ( $r = -.17, p < .001$ ) and moderately and negatively correlated with forgiveness of self ( $r = -.32, p < .001$ ) and forgiveness of situations ( $r = -.33, p < .001$ ) scores. Stress scores were not correlated with gender ( $r = .10, p > .01$ ) or age ( $r = -.10, p > .01$ ). However, stress scores weakly and negatively associated with self-efficacy scores ( $r = -.22, p < .001$ ) and forgiveness of others scores ( $r = -.11, p < .01$ ). In addition, stress scores moderately and negatively correlated with the scores for forgiveness of self ( $r = -.31, p < .001$ ) and forgiveness of situations ( $r = -.38, p < .001$ ). Lastly, depression scores strongly and positively correlated with anxiety ( $r = .82, p < .001$ ) and stress ( $r = .80, p < .001$ ) scores. Similarly, anxiety scores highly and positively correlated with stress ( $r = .82, p < .001$ ).

Table 1  
 Mean and Standard Deviation of Variables and Correlation Coefficients between Variables

	1	2	3	4	5	6	7	8	9
1. Gender									
2. Age	-.09								
3. Self-efficacy	-.10	.08							
4. Forgiveness of self	-.03	.03	.35**						
5. Forgiveness of others	-.02	.08	.11	.16**					
6. Forgiveness of situations	-.06	.04	.36**	.47**	.44**				
7. Depression	.00	-.10	-.24**	-.33**	-.12*	-.39**			
8. Anxiety	.04	-.08	-.17**	-.32**	-.07	-.33**	.82**		
9. Stress	.10	-.10	-.22**	-.31**	-.11*	-.38**	.80**	.82**	
Mean	1.62	23.30	28.64	28.10	25.51	27.43	12.97	14.68	18.34
SD	.49	3.05	6.17	5.18	7.11	5.83	10.48	9.83	10.21

Note. \* $p < .01$ , \*\* $p < .001$ .

Multivariate multiple regression analysis was performed to determine the extent and direction of how gender, age, and the scores for self-efficacy and forgiveness of self, others, and situations predict depression, anxiety, and stress scores as a whole. The multivariate multiple regression analysis showed that the multivariate main effect was significant (*Wilk's Lambda* = .75,  $F(18, 1508) = 8.83$ ,  $p < .001$ ). These findings indicate that one or more independent variables significantly predict one or more dependent variables. In order to examine the relationship between each dependent variable with the independent variables, a series of follow-up multiple regression analyses was performed, and these independent variables predicted depression, anxiety, and stress scores. The change statistics for the multivariate multiple regression analysis are shown in Table 2, and the multivariate multiple regression analysis results are shown in Table 3.

Table 2  
 Change Statistics for Multivariate Multiple Regression Analysis

Model	<i>R</i>	<i>R</i> <sup>2</sup>	<i>SE Est.</i>	Change Statistics				
				$\Delta R^2$	$\Delta F$	<i>df</i> <sub>1</sub>	<i>df</i> <sub>2</sub>	<i>p</i>
<b>Depression</b>								
Model 1	0.44	.20	9.46	.20	21.59	6	535	.001**
<b>Anxiety</b>								
Model 1	0.39	.15	9.10	.15	16.20	6	535	.001**
<b>Stress</b>								
Model 1	0.43	.18	9.28	.18	19.92	6	535	.001**

Note. \*\* $p < .001$ .

As seen in Table 2, the regression models of depression ( $F(6, 535) = 21.59$ ,  $p < .001$ ,  $R = .44$ ,  $R^2 = .20$ ), anxiety ( $F(6, 535) = 16.20$ ,  $p < .001$ ,  $R = .39$ ,  $R^2 = .15$ ) and stress ( $F(6, 535) = 19.22$ ,  $p < .001$ ,  $R = .43$ ,  $R^2 = .18$ ) were all statistically significant. All regression models had moderate effect sizes. As shown in Table 3, being female ( $\beta = -.04$ ,  $t(535) = -.95$ ,  $p > .01$ ), age ( $\beta = -.08$ ,  $t(535) = -2.16$ ,  $p > .01$ ), self-efficacy ( $\beta = -.08$ ,  $t(535) = -1.82$ ,  $p > .01$ ), and forgiveness of others ( $\beta = .06$ ,  $t(535) = 1.32$ ,  $p$

> .01) were not associated with depression scores. However, forgiveness of self ( $\beta = -.17, t(535) = -3.83, p < .001$ ) and forgiveness of situations ( $\beta = -.30, t(535) = -6.07, p < .001$ ) scores negatively associated with depressive symptoms. With respect to the anxiety model, being female ( $\beta = .01, t(535) = .22, p > .01$ ), age ( $\beta = -.07, t(535) = -1.80, p > .01$ ), self-efficacy ( $\beta = -.08, t(535) = -.01, p > .01$ ), and forgiveness of others ( $\beta = .09, t(535) = 2.02, p > .01$ ) were also not associated with anxiety scores. However, the scores for forgiveness of self ( $\beta = -.21, t(535) = -4.54, p < .001$ ) and forgiveness of situations ( $\beta = -.26, t(535) = -5.09, p < .001$ ) negatively associated with anxiety symptoms. Finally with respect to the stress model, being female ( $\beta = .07, t(535) = 1.77, p > .01$ ), age ( $\beta = -.08, t(535) = -1.94, p > .01$ ), self-efficacy ( $\beta = -.04, t(535) = -.99, p > .01$ ), and forgiveness of others ( $\beta = .06, t(535) = 1.39, p > .01$ ) were not associate with stress scores. The scores for forgiveness of self ( $\beta = -.16, t(535) = -3.54, p < .001$ ) and forgiveness of situations ( $\beta = -.31, t(535) = -6.10, p < .001$ ) negatively associated with stress symptoms.

Table 3  
Results of Multivariate Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients			
	B	SH	$\beta$	t	p	VIF
<b>Depression</b>						
Constant	46.60	4.13		11.29	.001**	
Female	-.81	.84	-.04	-.95	.340	1.02
Age	-.29	.03	-.08	-2.16	.031	1.02
Self-Efficacy	-.13	.07	-.08	-1.82	.069	1.23
Forgiveness of self	-.35	.09	-.17	-3.83	.001**	1.35
Forgiveness of others	.08	.06	.06	1.32	.187	1.26
Forgiveness of situations	-.54	.09	-.30	-6.07	.001**	1.65
<b>Anxiety</b>						
Constant	40.43	3.97		10.18	.001**	
Female	.18	.81	.01	.22	.829	1.02
Age	-.23	.13	-.07	-1.80	.072	1.02
Self-Efficacy	-.01	.07	-.01	-.20	.841	1.23
Forgiveness of self	-.40	.09	-.21	-4.54	.001**	1.35
Forgiveness of others	.12	.06	.09	2.02	.044	1.26
Forgiveness of situations	-.44	.09	-.26	-5.09	.001**	1.65
<b>Stress</b>						
Constant	46.77	4.05		11.54	.001**	
Female	1.47	.83	.07	1.77	.077	1.02
Age	-.26	.13	-.08	-1.94	.053	1.02
Self-Efficacy	-.07	.07	-.04	-.99	.325	1.23
Forgiveness of self	-.32	.09	-.16	-3.54	.001**	1.35
Forgiveness of others	.09	.06	.06	1.39	.164	1.26
Forgiveness of situations	-.54	.09	-.31	-6.10	.001**	1.65

Note. Gender is dummy coded with Male used as reference category, \*\* $p < .001$ .

One of the most important advantages of multivariate multiple regression analysis compared to traditional multiple regression analysis is that it can simultaneously test whether a significant difference exists between independent variables across regression equations that predict dependent variables in terms of their predictive power. In this context, a series of Wald tests was conducted to test whether the variables related to depression, anxiety, and stress significantly differ in terms of predictive power. The results of the Wald tests are shown in Table 4.

Table 4  
*Results of Multiple Comparisons Wald Test*

Dependent Variables	Independent Variable	$df_r$ , $df_d$	$F$	$p$
Depression-Anxiety	Forgiveness of self	1, 535	.71	.399
Depression-Stress	Forgiveness of self	1, 535	.27	.604
Anxiety-Stress	Forgiveness of self	1, 535	2.05	.153
Depression-Anxiety	Forgiveness of situations	1, 535	3.34	.068
Depression-Stress	Forgiveness of situations	1, 535	.01	.905
Anxiety-Stress	Forgiveness of situations	1, 535	3.04	.082

As shown in Table 4, forgiveness of self and forgiveness of situations have a similar predictive power on depression, anxiety, and stress symptoms. In other words, forgiveness of self and forgiveness of situations have a similar effect on depression, anxiety, and stress, albeit some differences exist in the unstandardized regression coefficients across the regression equations. As a result, when other variables were kept constant in this sample, it was found that students with high levels of self-forgiveness and situation-forgiveness are more likely to experience lower levels of depression, anxiety, and stress. In this context, a consistent finding of the multivariate multiple regression analysis was that students with high levels of self-forgiveness and situation-forgiveness are more likely to experience lower levels of negative affect as characterized by depression, anxiety, and stress symptoms.

## Discussion

Previous studies have shown that university students with mood and anxiety problems are less likely to seek professional psychological help for their mental health problems (Eisenberg, Golberstein, & Gollust, 2007). Thus, identifying the possible correlates of mood and anxiety disorders among college students constitutes an important step for campus counseling centers for increasing access to mental health care services as well as for effective primary and secondary interventions. Gender, age, self-efficacy and forgiveness of self, others and situations were investigated as predictors of depression, anxiety and stress levels in university students in this study.

The results of this study showed that university students with high levels of self- and situational-forgiveness are more likely to experience lower symptom levels of depression. This finding is in line with previous studies reporting that

dispositional forgiveness can help to alleviate depression and anxiety symptoms (Maltby, Macaskill, & Day, 2001; Toussaint & Webb, 2005). According to Toussaint and Webb (2005), self-forgiveness is an important predictor of psychological well-being, and increasing the levels of self-forgiveness can help to raise self-esteem levels while lowering symptoms of depression and anxiety. Wohl et al. (2008) also found that self-forgiveness was positively associated with psychological well-being. Furthermore, when individuals forgive themselves, patterns of self-punishment such as self-criticism or self-harm tend to be reduced, and individuals are more likely to be willing to take responsibility for their actions (Ranganadhan & Todorov, 2010). In this sense, self-forgiveness can provide relief (Bryan, Theriault, & Bryan, 2015) and help students diminish their depression levels. On the other hand, it was found that gender and age were not associated with the symptoms of depression, anxiety, or stress. This result is not consistent with previous studies generally suggesting that females tend to have higher levels of depression, anxiety and/or stress symptoms than males (Andrade et al., 2003; Kessler & Bromet, 2013; Van de Velde et al., 2010; Wahed & Hassan, 2017); nor is it consistent with some studies on college students (Wahed & Hassan, 2017) that have suggested age to positively correlate with the symptoms of depression, anxiety, and stress.

The results of this study also suggested that people with high self and situational forgiveness are more likely to experience less anxiety and fewer stress symptoms. This result is consistent with those of Subkoviak et al. (1995), who found that self-forgiveness negatively correlated with anxiety symptoms. According to Hargive (1994), the ability to forgive is associated with psychological healing as well as a reduction in the symptoms of anxiety and depression. Recent research suggests that not being able to forgive oneself is usually associated with post-traumatic stress symptoms (Doran, Kalayjian, Toussaint, & DeMucci, 2012; Hamama-Raz, Solomon, Cohen, & Laufer, 2008). Forgiveness of self and situations can help university students to lessen their emotional stress by facilitating psychological healing after events which they still have negative thoughts.

The results of this study demonstrate that forgiving others is not found to be a significant predictor of depression, anxiety, or stress among college students. This finding is not consistent with previous research findings that support forgiving others to be related to people's psychological health (Webb et al., 2012). These findings suggest that forgiving self and situations to be more effective than forgiving others in predicting symptoms of depression, anxiety, and stress among college students. Moreover, people can forgive themselves and situations more easily than they can forgive others. Forgiving others may also have a limited effect on symptoms of depression, anxiety, and stress when compared to forgiving the self and situations.



Lastly, the results of this study suggested that self-efficacy was not related with depression, anxiety, or stress symptoms. This finding is inconsistent with previous studies showing that self-efficacy negatively associated with depression, anxiety and stress (Ghaderi & Rangaiah, 2011; Tahmassian & Moghadam, 2011). However, previous studies have only examined the correlations of self-efficacy with depression, anxiety, and stress without taking into account people's other psychological qualities such as forgiveness. Thus, one possible explanation for this finding is that when considered with forgiveness, the effect of self-efficacy on depression, anxiety, and stress may be limited, especially in university students.

Consequently, the results of this study have shown that individuals with high levels of self and situation forgiveness are more likely to experience lower negative affect, which is characterized by depression, anxiety, and stress. These study findings have some practical implications for prevention and intervention efforts towards psychological stress as manifested in the symptoms of depression, anxiety and stress. Firstly, this study demonstrates the benefits of forgiveness on mental health, at least for Turkish university students. Therefore, as indicated in previous experimental studies, these results emphasize the importance of developing and applying forgiveness intervention programs for university students experiencing mood/anxiety problems. In this respect, encouraging students with high levels of depression, anxiety, or stress to participate in forgiveness interventions for improving their subjective well-being may be useful. Moreover, having university mental health professionals inform their clients about the beneficial consequences of being able to forgive oneself and situations during their counseling seasons may also be useful, as well as having university counseling centers inform college students about the potential benefits of self-forgiveness related to psychological distress. Because forgiveness of situations negatively correlates with the symptoms of depression, anxiety, and stress, university mental health professionals may also teach clients with depression, anxiety, or stress problems some REBT techniques (e.g., teaching the ABC model) for objectively evaluating events or situations.

This research has some limitations. First, forgiveness of self and forgiveness of situations subscales had relatively low Cronbach's alpha reliability coefficients in this study. Although Cronbach's alpha internal consistency coefficient may be low when scales have limited numbers of items (Hair et al., 2014), as well as measurements and evaluation experts suggest that researchers can retain subscales with reliability estimates as low as .50 without weakening validity coefficients (Schmitt, 1996), it is recommended to replicate this study with other college student samples to test the validity of the study findings. The second limitation is that this study has been carried out on a limited number of university students in the Central Black Sea Region of Turkey. For this reason, the external validity of this study is low. The

third limitation is that a correlational research design has been employed in this study. Although a correlational research design provides information on the current situation in the studied sample, causality cannot be established between the findings; it can only give information about possible risks or protective factors. For this reason, carrying out longitudinal studies in future studies may be useful. Finally, the data from university students has been collected by using self-report scales. Self-report scales may lead to a number of general method biases, such as social desirability (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In this study, however, the attempt has been made to prevent social desirability as a general method bias by ensuring that university students' responses were kept confidential (Podsakoff et al., 2003). Nevertheless, evaluating these variables with the data obtained from different sources of information (parents, close friends, teachers) in further studies may be useful.

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