



# The Roles of Post-Traumatic Stress Symptoms, Resilience, and Hope on Post-Traumatic Growth in Survivors of Novel Coronavirus Disease (Covid-19)

*Yeni Koronavirüs Hastalığını (Covid-19) Yenmiş Bireylerde Travma Sonrası Büyümede Travma Sonrası Stres Belirtileri, Psikolojik Sağlık ve Umudun Rolü*

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## ABSTRACT

The aim of this research is to examine the role of post-traumatic stress symptoms, resilience and hope in post-traumatic growth in individuals who have overcome the novel coronavirus disease (Covid-19). The study group of the research consisted of 454 participants aged between 18 and 72. The mean age of the participants was 32.91, and the standard deviation was 11.18. Participants answered the demographic information form, Post Traumatic Growth Inventory, Trait Hope Scale, Post Traumatic Stress Diagnostic Scale, and Adult Resilience Scale. The results showed that posttraumatic growth levels of women were significantly higher than men's posttraumatic growth levels. Moreover the post-traumatic growth levels of those who had the disease severely were higher than the post-traumatic growth levels of those who had the disease mildly and moderately. According to the recovery time from the disease, the post-traumatic growth levels of those who had the disease for a long time were found to be higher than the post-traumatic growth levels of those who had the disease in a short time. Post-traumatic stress symptoms, resilience and hope were found to be positive and significant predictors of post-traumatic growth. Post-traumatic stress symptoms, psychological resilience and hope-focused psychosocial interventions by mental health professionals and healthcare professionals during the epidemic may help people to endure an unknown disease and cope with the trauma that this disease has created in their lives, thus increasing their post-traumatic growth levels.

**Keywords:** covid-19, post traumatic growth, post traumatic stress symptoms, resilience, hope.

## ÖZ

Bu araştırmanın amacı yeni koronavirüs hastalığını (Covid-19) yenmiş bireylerde travma sonrası büyümede travma sonrası stres belirtileri, psikolojik sağlık ve umudun rolünü incelemektir. Araştırmanın çalışma grubunu yaşları 18 ve 72 arasında değişmekte olan 454 katılımcı oluşturmuştur. Katılımcıların ortalama yaşı 32.91, standart sapması 11.18 olarak bulunmuştur. Katılımcılar demografik bilgi formunu, Travma Sonrası Büyüme Envanterini, Sürekli Umud Ölçeğini, Travma Sonrası Stres Tanı Ölçeğini ve Yetişkinler için Psikolojik Dayanıklılık Ölçeğini cevaplamıştır. Araştırma sonucunda cinsiyete göre kadınların travma sonrası büyüme düzeylerinin erkeklerin travma sonrası büyüme düzeylerinden anlamlı bir şekilde yüksek olduğu bulunmuştur. Hastalığı geçirme düzeyine göre hastalığı ağır atlatanların travma sonrası büyüme düzeyleri hastalığı hafif ve orta atlatanların travma sonrası büyüme düzeylerinden daha yüksek olduğu sonucuna ulaşılmıştır. Hastalıktan iyileşme süresine göre ise hastalığı uzun sürede atlatanların travma sonrası büyüme düzeyleri kısa sürede atlatanların travma sonrası büyüme düzeylerinden daha yüksek olduğu belirlenmiştir. Son olarak araştırma sonuçları travma sonrası stres belirtileri, psikolojik sağlık ve umut değişkenlerinin travma sonrası büyümenin olumlu yönde ve anlamlı bir yordayıcısı olduğunu göstermiştir. Salgın hastalık döneminde ruh sağlığı uzmanları ve sağlık çalışanları tarafından yapılacak olan travma sonrası stres belirtileri, psikolojik sağlık ve umut odaklı psikososyal müdahaleler insanların bilinmeyen bir hastalığa dayanmalarına ve bu hastalığın hayatlarında oluşturduğu travmayla başa çıkmalarına yardımcı olarak travma sonrası büyüme düzeylerini artırmaya olanak sağlayabilir.

**Anahtar Sözcükler:** covid-19, travma sonrası büyüme, travma sonrası stres belirtileri, psikolojik sağlık, umut

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## Introduction

The Covid-19 pandemic affected the whole world in a very short time, therefore, caused people to change their behaviors, lifestyles, and habits. Some of the practices that have changed people's lives due to the Covid-19 pandemic, which is still in effect as of 2022 -at the time that the study was carried out- are the closure of businesses or institutions, social distancing, curfews, flexible working hours, quarantine, working from home, travel restrictions, and distance education practices (Akbaş and Dursun 2020). This pandemic has caused a great global crisis that significantly affected social and economic life, destroyed trust in institutions, caused people to question values, created an atmosphere of uncertainty and fear. Furthermore, several factors such as uncertainty about the cause of the disease, unable to see the virus with the naked eye, and the fact that all people in the society are at risk have turned the Covid-19 pandemic into a universal trauma affecting all people (Aşkın et al. 2020).

Historically, scholars have focused on the negative and pathological consequences of experiencing a traumatic event. Recent studies have revealed that individuals experiencing difficulties not only display negative and pathological outcomes but also gain positive outcomes such as growth (Bonanno 2004, Calhoun and Tedeschi 2004, Joseph and Linley 2006). Studies in the literature have emphasized that difficulties, challenges, failure, and even trauma can lead to positive changes in individuals (Jayawickreme and Infurna 2020). Helgeson et al. (2006) defined such positive changes as "post-traumatic growth" "stress-related growth" or "benefit-seeking". Post-traumatic growth refers to positive psychological changes that one acquires after coping with significant crises, including appreciating life, establishing relationships with others, finding new opportunities in life, personal strength, and spiritual change (Tedeschi and Calhoun 1996). Especially as a result of the emergence of positive psychology, studies and reports on post-traumatic growth have increased in recent years (Jayawickreme and Infurna 2020). Furthermore, the determination of factors that could be related to post-traumatic growth is a topic that scholars attach importance recently (Morrill et al. 2008, Sherr et al. 2011, Ho et al. 2011, Ssenyonga et al. 2013).

Post-traumatic stress symptoms are among the factors that might be related to post-traumatic growth. Post-traumatic stress disorder (PTSD) is a psychiatric disorder that occurs after experiencing a traumatic event (e.g., a serious accident or injury, threat to physical safety, death or threat of death, sexual assault, natural disasters, war, etc.) that is perceived as trauma and affects individuals directly or indirectly (Köroğlu 2014). The diagnosis of PTSD requires examination of specific criteria that focus on identifying causes and symptoms (Forte et al. 2020). Individuals with PTSD tend to avoid activities, places, or people that remind them of the traumatic event (Köroğlu 2014). Those who define the term post-traumatic growth suggested that there is a positive relationship between growth and stress. High

stress is considered a necessary step enabling one to rethink, reorganize their priorities, and rebuild values that are disrupted by the trauma (Marziliano et al. 2019). Previous studies showed that a significant and positive relationship exists between post-traumatic stress symptoms and post-traumatic growth (Chopko 2010, Jin et al. 2014).

Resilience is another factor that post-traumatic growth may be associated with. Resilience refers to one's capacity to heal when exposed to stressful events (Rahat and İlhan 2016). Rutter (2007) stated that resilience is demonstrating relatively good outcomes despite one's exposure to a risk expected to cause serious distress. According to the results of a recent study, resilience facilitates psychological adjustment after a traumatic experience (Ye et al. 2020). Some studies have revealed that resilience positively predicts post-traumatic growth. Furthermore, some studies revealed that resilience positively predicts post-traumatic growth (Mahdi et al. 2014, Wu et al. 2015).

Hope is also a factor that post-traumatic growth may be associated with. Hope is a positive motivational state based on agency for a sense of accomplishment and pathways to achieve the goal. People can sometimes find reasons to distance themselves from the negative consequences of life and use hope as a coping mechanism to achieve the positive outcomes they desire (Gales 2018). Hope supports one's psychological adjustment and well-being. Moreover, hope is a potentially important source of resilience for individuals who experienced traumatic events (Weinberg et al. 2016). Hope is of critical importance in difficult times of life as it helps to create a positive perception and determination towards difficulties (Gales 2018). Previous reports showed that a significant and positive relationship exists between hope and post-traumatic growth (Heidazadeh et al. 2016, Salloum et al. 2019).

Recent studies also showed that post-traumatic growth can also vary with gender, recovery time, and course of illness. For example, post-traumatic growth levels of women were found to be significantly higher than men (Karataş 2020, Chen et al. 2021, Kalaitzaki 2021). However, only a limited number of studies on recovery time and course of illness have been reported. Therefore, more research data is needed about recovery time from the disease, the course of illness, and post-traumatic growth.

The type of pneumonia referred to as Covid-19 is life-threatening and has posed a major public threat globally (Tamiolaki and Kalaitzaki 2020). With the increasing number of infected cases and mortality, many patients have experienced both physical pain and severe psychological distress. Covid-19 patients usually show symptoms of loneliness, anger, anxiety, depression, insomnia, and post-traumatic stress due to social isolation, perceived danger, uncertainty, physical discomfort, side effects of drugs, fear of transmitting the virus to others, and excessively negative news in the mass media. Such factors may negatively affect individuals' social life, job performance, and life quality (Bo et al. 2020). Although the number of studies examining

the negative psychological consequences of Covid-19 is still low, it is known that the number of studies focusing on the psychologically positive outcomes of Covid-19 disease in humans is even less (Tamiolaki and Kalaitzaki 2020). The pandemic and working during this period do not only create negative effects such as sleep, eating, social disruptions, and nightmares, but sometimes, abandonment, exhaustion, disappointment, and anger. In addition to these negative outcomes of the pandemic, the consequences of traumatic experiences can positively change individuals through post-traumatic growth (Chen et al. 2021). Post-traumatic growth arises when individuals try to cognitively (and consciously) reconstruct reality by changing their life stories, themselves, others, and the world to better understand themselves after traumatic life events (Tedeschi and Calhoun 1996).

A literature survey revealed that some studies examined post-traumatic growth with different samples such as cancer patients, refugees, victims of terrorist attacks, SARS epidemic, martyrs, and veterans. Furthermore, post-traumatic stress symptoms and resilience variables were examined concerning post-traumatic growth in these samples. However, only few studies have examined the relationship between post-traumatic growth in survivors of new coronavirus disease (Covid-19) and some psychological variables including post-traumatic stress symptoms, psychological resilience, and hope (Alshehri et al. 2020, Barthélemy et al. 2020, Counted et al. 2022). On the other hand, to the best of our knowledge, no studies in Turkey have yet examined this relationship. We believe that the results of this study would reveal the factors related to the post-traumatic growth in individuals during the Covid-19 pandemic and provide crucial data to mental health professionals to enhance post-traumatic growth in individuals. Accordingly, the current study aims to examine the roles of post-traumatic stress symptoms, resilience, and hope on post-traumatic growth in survivors of Covid-19. Moreover, the post-traumatic growth levels of the participants were examined according to gender, course of illness (mild, moderate, critical), and recovery time.

## Method

A correlational study was designed to examine the roles of post-traumatic stress symptoms, resilience, and hope on the post-traumatic growth in survivors of Covid-19. In correlational studies, relationships between two or more variables are examined without any interference with the variables (Büyüköztürk et al. 2016).

## Sample

The sample of this study consisted of 454 individuals from Marmara, Aegean, Mediterranean, Black Sea, Central Anatolia, Eastern Anatolia, and Southeastern Anatolia regions of Turkey selected by the convenient sampling method. The convenience sampling method refers to the collection of data from an easily accessible sample (Büyüköztürk et al. 2016). Of the 454 participants, 287 (63.2%) were females and 167 (36.8%) were

males. The age range of the participants varied between 18-72 and the average age was 32.91 years ( $SD = 11.18$ ). Of the 454 participants, 145 participants survived the Covid-19 disease in 0-4 weeks (31.9%), 187 participants in 1-3 months (41.2%), 94 participants in 3-6 months (20.7%), and finally, 28 participants (6.2%) survived Covid-19 in 6 months or longer. The recovery time of the participants varied between 1-14 days and over 14 days and the average recovery time was calculated as 16.22 ( $SD = 21.44$ ). Of the 454 participants, 190 survived the Covid-19 disease mildly (41.9%), 180 (39.6%) moderately, and 84 (18.5%) critically.

## Measures

A demographic information sheet prepared by the authors was used to collect socio-demographic information about the participants. Turkish versions of Posttraumatic Growth Inventory, State Hope Scale (Tarhan and Bacanlı 2015), The Posttraumatic Diagnostic Scale (Işıklı, 2006), Resilience Scale for Adults (Basım and Çetin 2011) was used measure collect data from participants.

### Demographic Information Sheet

The demographic information sheet prepared by the authors consisted of questions such as gender, age, education level, and course of the disease, duration after getting over the disease, and duration of the treatment (days).

### Posttraumatic Growth Inventory

The Posttraumatic Growth Inventory (PDS) was developed by Tedeschi and Calhoun to measure positive changes gained by individuals after experiencing traumatic events (Lenz et al. 2021). The inventory is composed of 21 items through five subscales (Kağan et al. 2012). Posttraumatic Growth Inventory (PDS) was developed by Tedeschi and Calhoun and adapted into Turkish by Kağan et al (2012). The Turkish version of the scale is composed of three dimensions namely, "Changes in self perception" (items 5, 10, 11, 12, 13, 15, 16, 17, 18, and 19), "Changes in philosophy of life" (items 1, 2, 3, 4, 7, and 14), and "Changes in relationships" (items 6, 8, 9, 20, and 21). The internal consistency was calculated as  $\alpha=0.92$  for all items. According to the test-retest results implemented after 15 days, the test-retest reliability found to be 0.83 for all items and ranged between 0.70 and 0.85 for subscales. The total score that can be obtained from the PDS (sum of the scores of the three sub-dimensions) varies from 0 and 105. Higher scores from the PDS indicate that one gained positive outcomes from the trauma they experienced (Kağan et al. 2012). The 21-item Posttraumatic Growth Inventory was used to measure positive changes in survivors of the Covid-19 disease which considered a stressful disease. In the current study, the Cronbach's alpha of the PDS was found to be .94.

### Resilience Scale for Adults

Resilience Scale for Adults was prepared by Friborg et al. (2003). This scale can be used as a valid and reliable tool in health and clinical psychology to measure the presence of protective factors

that are important for regaining and maintaining mental health. This scale was adopted into Turkish by Basım and Çetin (2011). This Likert-type scale consists of 33 items in six sub-scales namely, "Personal Competence", "Social Competence", "Family Coherence", "Social Support", "Future Perception", and "Personal Structure". In order to ensure that the items are answered objectively, a rating design consisting of five different boxes with positive and negative responses on different sides was used (Basım and Çetin 2011). Higher scale scores indicate that person is psychologically healthier, more adaptable, and therefore more resilient (Friborg et al. 2005). In the current study, the Cronbach's alpha of the scale was calculated as .85.

### **State Hope Scale**

State Hope Scale was developed by Snyder et al. (1991) and adopted into Turkish by Tarhan and Bacanlı (2015). The scale measures state hope levels in adults aged 15 years and consisted of 12 items in two subscales. Each subscale, namely *Pathways* (items 1, 4, 6, and 8) and *Agency* (items 2, 9, 10, and 12) consists of 4 items. Of these four items, one item is related to the past, two are present, and one is related to the future. The remaining four items (3, 5, 7, 11) are non-hope-related filler items (Tarhan and Bacanlı 2015). The Cronbach's alpha for the whole scale varied between .74 and .84. The participants were asked to mark the most suitable item for them using an 8-point Likert scale. The filler items were not scored and the sum of the Pathways and Agency sub-scale scores was calculated as the State Hope Scale total score. The minimum and maximum scores that can be obtained from the scale are 8 and 64, respectively. In the current study, the Cronbach's alpha of the State Hope Scale was found to be .84 (Tarhan and Bacanlı 2015).

### **Posttraumatic Diagnostic Scale**

The scale consists of 50 self-rating items and was developed to identify post-traumatic stress disorder. The scale was adopted into Turkish by Işıklı and Dürü (2006). The scale was prepared considering DSM-IV diagnostic criteria and is composed of four parts. The first part aims to determine the type of traumatic event experienced by the participant. The second part identifies the traumatic event (if there is more than one) with the highest impact on the individual. This part includes six yes-no questions to measure the severity of the traumatic event. The higher number of "yes" answers indicates the severity of the event is higher. The third part includes a sub-scale consisting of 17 items measuring posttraumatic symptoms. In the current study, these 17 items were called the Post-Traumatic Stress Symptoms and were used to determine the severity of the trauma symptoms. This scale has a Likert-type rating ranging from 0-3. The minimum and maximum scores that can be obtained from this scale were 0 and 51, respectively. Higher scale scores indicate that the person is highly affected by the event and displays post-traumatic stress symptoms. The final part consists of nine yes-no questions measuring the impact of a traumatic event on the person's life. In our study, the Cronbach's alpha of the scale was found to be .94.

### **Procedure**

Before conducting the study, the required permissions were received from the Ministry of Health (Turkey) and the Social Sciences and Humanities Research and Publication Ethics Committee of Ondokuz Mayıs University dated 30.10.2020 and numbered 2020/660. The data of this study was collected from survivors of the Covid-19 disease between November 2020 and February 2021. A form including the scales was prepared on Google forms and the link for the survey was sent online to survivors of the Covid-19 disease through social media networks (Instagram, Facebook, Twitter, WhatsApp, and Telegram). Before responding to the surveys, the participants were informed about the purpose of the study, the participation was voluntary, their personal information will not be requested, their answers will be kept confidential and will be used only for scientific purposes, how to fill out the survey, and duration of responding to the survey. The participants filled out the survey after their confirmation of the informed consent form. The participants were responded to four different scales and a demographic information sheet. The participants were also told that they could end their participation at any time.

### **Statistical Analysis**

All statistical analyses were conducted on SPSS version 22. Before that, the normality and reliability of the data, missing values, outliers, and the assumptions of the analysis were examined. In this study, the normality assumption was examined by kurtosis and skewness values and all kurtosis and skewness values were found to be between  $\pm 3$  (Garson 2012). These results indicate that the scale scores are approximately normally distributed. No missing values, univariate or multivariate outliers found in the dataset. Independent samples t-test was conducted to examine if the post-traumatic growth levels of the participants significantly differ with respect to their gender and recovery time from the disease. One-way analysis of variance (ANOVA) was used to determine if post-traumatic growth mean scores differ between disease recovery levels. For significant ANOVA results, post-hoc Scheffé's test was used to determine source of difference among groups. Pearson correlation analysis was used to examine the relationships between post-traumatic stress symptoms, resilience, hope, and post-traumatic growth. Multiple linear regression analysis was performed to determine the predictive power of posttraumatic stress symptoms, resilience, and hope on posttraumatic growth, as well as to identify predictor variables of post-traumatic growth. In the multiple regression analysis, all variables that were found to be related to posttraumatic growth by correlation analysis were entered simultaneously into the regression equation. Univariate normality, normality of regression errors, homogeneity of variances, homoscedasticity, linearity, and multicollinearity assumptions were examined in appropriate analyzes and found to be met (Büyüköztürk 2021). In all analyses, a  $p$ -value of  $\leq .05$  was considered significant.

## Results

Independent samples t-test was conducted to examine if the post-traumatic growth levels of the participants who overcame Covid-19 significantly differ with their gender. The posttraumatic growth mean scores, standard deviations, and result of independent samples t-test according to gender given in Table 1.

As seen in Table 1, a significant difference was found between the post-traumatic growth mean scores of females and males ( $t(452) = 2.92, p < .01$ , Cohen's  $d = .28$ ). The t-test results showed that post-traumatic growth levels of females ( $\bar{x}=57.37$ ) were higher than post-traumatic growth levels of males ( $\bar{x}=50.76$ ). These findings indicate that post-traumatic growth significantly differs with respect to gender.

The mean scores of the severity of disease and post-traumatic growth were compared using one way ANOVA to determine if post-traumatic growth mean scores significantly differ with respect to the course of disease among survivors of Covid-19. The results are shown in Table 2.

According to Table 2, a significant difference was observed between the post-traumatic growth mean scores with respect to course of the disease ( $F(2, 451) = 10.52, p < .001, \eta^2 = .04$ ). This difference had a low effect size. According to the results of Scheffé's test conducted to determine which mean scores are significantly different, post-traumatic growth levels among survivors of moderate Covid-19 disease ( $\bar{x} = 57.00$ ) were found to be significantly higher than those with mild Covid-19 ( $\bar{x} = 49.60$ ). Furthermore, according to Scheffé's test results, post-traumatic growth levels of survivors of critical Covid-19 disease ( $\bar{x} = 62.60$ ) were found to be significantly higher than those with moderate Covid-19 ( $\bar{x} = 57.00$ ) and mild Covid-19 disease ( $\bar{x} = 49.60$ ). Based on the test results, it can be argued that course of the disease had a significant impact on post-traumatic growth.

Independent samples t-test was conducted to examine if the post-traumatic growth levels of the survivors of Covid-19 significantly differ with respect to recovery time from Covid-19. The results of independent samples t-test, post-traumatic growth mean scores, and standard deviations are shown in Table 3.

As seen in Table 3, there is a significant difference ( $t(452) = -2.83, p < .05$ , Cohen's  $d = .27$ ) between the post-traumatic growth mean scores of people who overcame the disease between 1-14 days ( $\bar{x} = 52.61$ ) and those who overcame it in more than 15 days ( $\bar{x} = 59.06$ ). The effect size (Cohen's  $d = .27$ ) calculated after the test indicated that the difference is small. The findings pointed out that the people who overcome the disease in more than 15 days experienced higher post-traumatic growth than those who overcome it between 1-14 days. Accordingly, it can be argued that recovery time from the disease had a significant impact on post-traumatic growth levels.

Pearson correlation analyses were conducted to examine the direction of the relationships between post-traumatic stress symptoms, resilience, hope, and post-traumatic growth. A multiple regression analysis was then performed. The results of the Pearson correlation analysis conducted to examine the strength and direction of the relationships between the variables are given in Table 4.

According to Table 4, there is a low and positive correlation between post-traumatic growth total scores and post-traumatic stress symptoms ( $r = .18$ ), resilience ( $r = .26$ ), and hope ( $r = .26$ ) total scores.

To determine the predictive power of post-traumatic stress symptoms, resilience, and hope in people who overcome the Covid-19 disease for post-traumatic growth and to identify predictive variables of post-traumatic growth, a linear regression analysis was performed. The change statistics for linear regression are given in Table 5, and results of linear regression analysis reported in Table 6.

**Table 1. Independent samples t-test results according to gender.**

|        | n   | $\bar{X}$ | S.d.  | Df  | t    | p     | Cohen's d |
|--------|-----|-----------|-------|-----|------|-------|-----------|
| Female | 287 | 57.37     | 22.75 | 452 | 2.92 | .004* | .28       |
| Male   | 167 | 50.76     | 24.14 |     |      |       |           |

Note: Cohen's d effect size,  $p < .01$ \*

**Table 2. The results of one way ANOVA for course of the disease**

|          | n   | $\bar{X}$ | S.D.  | df <sub>1</sub> , df <sub>2</sub> | F     | p       | $\eta^2$ | Post hoc |
|----------|-----|-----------|-------|-----------------------------------|-------|---------|----------|----------|
| Mild     | 190 | 49.60     | 21.98 | 2, 451                            | 10.52 | .001*** | .04      | 2-3      |
| Moderate | 180 | 57.00     | 23.39 |                                   |       |         |          | 1-2      |
| Critical | 84  | 62.60     | 24.29 |                                   |       |         |          | 1-3      |

Note:  $\eta^2$  = effect size,  $p < .001$ \*\*\*

The multiple linear regression analysis results indicated that the regression model was statistically significant ( $F(3, 450) = 24.53, p < .001, \Delta R^2 = .14$ ). The model explains about 14% of the variance in the post-traumatic growth scores and has a moderate effect size. As seen in Table 6, post-traumatic stress symptoms ( $\beta = .23, t = 5.35, p < .001$ ), resilience ( $\beta = .21, t = 3.77, p < .001$ ), and hope ( $\beta = .14, t = 2.60, p < .01$ ) are positive significant predictors of post-traumatic growth scores. In other words, survivors of Covid-19 with high post-traumatic stress symptoms, resilience, and hope also displayed high post-traumatic growth in our sample.

## Conclusion, Discussion, and Recommendations

The current study aimed at examining the roles of post-traumatic stress symptoms, resilience, and hope on post-traumatic growth in people who overcame Covid-19. Furthermore, post-traumatic growth in participants was also examined according to gender, course of disease (mild, moderate, critical), and recovery time. The results obtained showed that post-traumatic growth scores of people who overcome Covid-19 significantly differed with respect to gender. Accordingly, women had higher post-traumatic growth than males. This finding is similar to previous studies

**Table 3. Results of the independent samples t-test for post-traumatic growth by recovery time**

|                  | n   | $\bar{X}$ | S.d.  | df  | t     | p     | Cohen's d |
|------------------|-----|-----------|-------|-----|-------|-------|-----------|
| 1-14 days        | 290 | 52.61     | 23.39 | 452 | -2.83 | .005* | .27       |
| 15 days and more | 164 | 59.06     | 23.09 |     |       |       |           |

Note: Cohen's d effect size,  $p < .01^{**}$

**Table 4. The results of the Pearson correlation analysis**

|                                   | 1     | 2      | 3     | 4     |
|-----------------------------------|-------|--------|-------|-------|
| 1. Post-traumatic growth          |       |        |       |       |
| 2. Resilience                     | .26** |        |       |       |
| 3. Hope                           | .26** | .63**  |       |       |
| 4. Post-traumatic stress symptoms | .18** | -.16** | -.09* |       |
| $\bar{x}$                         | 54.94 | 125.75 | 49.63 | 16.42 |
| S.d.                              | 23.46 | 17.30  | 7.49  | 13.15 |

Note: N = 454,  $p < .05^*$ ,  $p < .01^{**}$

**Table 5. Change statistics for liner regression analysis**

| Model                 | R   | R <sup>2</sup> | Cor. R <sup>2</sup> | SH Tah. | Change statistics |            |                 |                 |        |
|-----------------------|-----|----------------|---------------------|---------|-------------------|------------|-----------------|-----------------|--------|
|                       |     |                |                     |         | $\Delta R^2$      | $\Delta F$ | df <sub>1</sub> | df <sub>2</sub> | p      |
| Post-traumatic growth | .37 | .14            | .13                 | 21.82   | .14               | 24.53      | 3               | 450             | .001** |

Note: N = 454,  $p < .001^{***}$

**Table 6. The results of the multiple linear regression analysis for predicting post-traumatic growth scores**

|                                | Unstandardized Coefficients |      | Standardized Coefficients | t     | p       |
|--------------------------------|-----------------------------|------|---------------------------|-------|---------|
|                                | B                           | S.E. | $\beta$                   |       |         |
| Constant                       | -11.64                      | 8.38 |                           | -1.39 | .165    |
| Post-traumatic stress symptoms | .42                         | .08  | .24                       | 5.35  | .001*** |
| Resilience                     | .29                         | .08  | .22                       | 3.71  | .001*** |
| Hope                           | .46                         | .15  | .15                       | 2.60  | .010**  |

Note: N = 454,  $p < .01^{**}$ ,  $p < .01^{***}$

on this topic. For example, Karataş (2020) examined the social effects of the Covid-19 pandemic and post-traumatic growth. The author found that the participants' post-traumatic growth total scale and sub-scale scores significantly differ with gender. Consistent with this, in the current study post-traumatic growth total scale scores of women were found to be higher than men. Chen et al. (2021) examined post-traumatic growth among nurses during the Covid-19 pandemic and found that female nurses had higher scores than male nurses. In a study by Kalaitzaki (2021) conducted during the first Covid-19 quarantine in Greece about post-traumatic growth, women were found to have higher post-traumatic growth than men. Similarly, Gökmen and Deniz (2020) examined post-traumatic growth and found that female participants had significantly higher post-traumatic growth scores than male participants. Bianchini et al. (2017) studied post-traumatic growth among teens who survived the 2009 L'Aquila earthquake in Italia and they determined statistically significant gender-related differences in post-traumatic growth in favor of women. Jeon et al. (2017) examined post-traumatic growth among Korean Americans and women were found to have significantly higher post-traumatic growth scores than men.

The reason for higher post-traumatic growth levels among women compared to men might be due to the difference in the responses of men and women to traumatic events (Tedeschi and Calhoun 1996). Women tend to think more about their experiences than men (Xie et al. 2019). Thinking more about their experiences might make more contributions to women by increasing personal awareness and understanding of the importance of social connections (Akbar and Witruk 2016). In such cases, a traumatic event might be triggered a process of evolving into a more constructive development -such as growth- and a better mental condition (Xie et al. 2019). On the other hand, women receive more social support compared to men when faced with difficult situations (Swickert and Hittner 2009). This might be a reason why women experience more post-traumatic growth than men.

In the present study, significant differences were found in the post-traumatic growth scores by course of disease and recovery time. Post-traumatic growth levels were found to be higher in the participants who survived the disease in 15 or more days than those who survived in 14 or fewer days. According to the symptoms of the disease, post-traumatic growth levels among survivors of moderate or critical Covid-19 disease were found to be significantly higher than those with mild Covid-19. According to a literature survey, no studies have found that examined post-traumatic growth according to course of disease (mild, moderate, critical) and recovery time from disease. However, when the studies conducted with variables that can be claimed to be similar with these variables are evaluated, it is thought that these results of the study are similar to the previous research results. For example, Chen et al. (2021) conducted a large-scale study examining trauma, burnout, and post-traumatic growth among nurses during the Covid-19 pandemic. The study was conducted

on persons working in intensive care units, in hospitals for Covid-19 patients, and the treatment of Covid-19 patients. Their results revealed that persons working in intensive care units, in hospitals for Covid-19 patients, and in the treatment of Covid-19 patients had higher post-traumatic growth levels, higher total and sub-scale scores than those who are not working in Covid-19 hospitals or the treatment of Covid-19 patients.

Cui et al. (2021) examined post-traumatic growth in nurses working on front lines during the Covid-19 pandemic and found that the nurses experienced moderate and high levels of post-traumatic growth. Sun et al. (2021) conducted a study examining post-traumatic growth in individuals diagnosed with Covid-19 in China and participants stated positive changes in their social environment after being diagnosed with Covid-19 such as the happiness of surviving, a reassessment of life priorities, a greater willingness to form closer relationships with family and friends, as well as to help others and increased awareness regarding personal development and the importance of personal health. Considering the findings of the current study, the chance of individuals experiencing these positive changes reported by the research discussed above is thought to be related to the longer recovery times and the severity of the disease. Positive changes that emerge as a result of struggling with stressful life events are considered post-traumatic growth (Yıldız 2021). Post-traumatic growth is also associated with re-evaluating life in a positive way (Tamiolaki and Kalaitzaki 2020). Post-traumatic stress symptoms increase in individuals who are seriously ill or have lost loved ones (Miller 2020). It seems that post-traumatic growth accompanies these conditions.

Finally, the present study also examined if post-traumatic stress symptoms, resilience, and hope predict post-traumatic growth in survivors of the Covid-19. The results revealed that post-traumatic stress symptoms, resilience, and hope positively predict post-traumatic growth. This finding of the study indicates that post-traumatic stress symptoms, resilience, and hope in survivors of Covid-19 increase post-traumatic growth levels. A review of previous studies on this topic showed that similar results were reported. Solomon and Dekel (2007) conducted a study investigating post-traumatic stress symptoms and post-traumatic growth in Israeli former prisoners of war and they found that moderate post-traumatic stress symptoms are associated with higher post-traumatic growth. Shamia et al. (2015) examined post-traumatic stress disorder and post-traumatic growth among nurses in Gaza. The authors found a low and positive correlation between post-traumatic stress disorder and post-traumatic growth. Özcan (2019) examined the predictive role of self-compassion and post-traumatic stress on post-traumatic growth in adults and determined that post-traumatic stress predicts post-traumatic growth. Özcan and Arslan (2020) conducted a study examining the mediator role of social support and morale in the relationship between post-traumatic stress and post-traumatic growth. The authors stated

that in the group with higher traumatic stress, the overall effect on post-traumatic growth is significant. Dekel et al. (2012) conducted a longitudinal study examining post-traumatic growth and post-traumatic stress and found that people with post-traumatic stress symptoms reported higher levels of post-traumatic growth over time compared to those without post-traumatic stress symptoms.

These findings are consistent with the results indicating that one should experience a stressful life event and be affected by it for post-traumatic growth (Özcan and Arslan 2020). Similarly, in the current study, post-traumatic stress symptoms were found to increase post-traumatic growth. One's three core assumptions are that the world is a good place, the self is valuable, and the world is meaningful (Janoff-Bulman, 1992). These core assumptions which are destroyed after experiencing trauma can be re-established more strongly (Danışman et al., 2018). Theories explaining the symptoms of post-traumatic stress emphasize that one makes some cognitive inquiries when coping with difficult situations and develops different coping methods depending on these inquiries (Özcan 2019). Cognitive and behavioral situations change one's life philosophy, self-perception, and interpersonal relationships, thus contributing to the post-traumatic growth experience (Janoff-Bulman 2006). This may be a reason why traumatic stress symptoms is a positive predictor of post-traumatic growth.

Resilience is another variable whose relationship with post-traumatic growth was examined in the current study. The results obtained are consistent with the other reports indicating post-traumatic growth increases as psychological resilience increases. For example, Cengiz et al. (2019) conducted a study addressing the relationship between resilience and post-traumatic growth among Syrian refugees and observed a positive relationship between resilience and post-traumatic growth. Plus, their regression analysis results indicated that resilience supports post-traumatic growth. Seidmahmoodi et al. (2011) examined factors contributing to post-traumatic growth and reported a positive relationship between the total scores of resilience and post-traumatic growth. Ogińska-Bulik (2015) studied the relationship between post-traumatic growth after the death of a relative and resilience; accordingly, a positive relationship between resilience and post-traumatic growth was reported. In a study by Kırşavoğlu (2020) examining resilience and post-traumatic growth in patients with bipolar disorder and their caregivers, positive correlations were found between the components of resilience and post-traumatic growth.

Individuals who have resilience were reported to display a higher tendency to use problem-focused coping skills and this lays a foundation for post-traumatic growth. A possible explanation for this finding of the study might be that individuals who have high psychological resilience also display the ability to reduce the negative effects of the traumatic events they faced (Özçetin and Hiçdurmaz 2017). This allows one to see their traumatic

experiences as less dangerous, maintains their emotional balance, and allows them to gain new experiences even after stressful events (Oginska-Bulik 2015). Furthermore, higher resilience levels mean that one can improve their well-being under stressful events and therefore, individuals with higher resilience display effective coping skills when faced with stressful events (Sexton et al. 2010). Being aware of self-power and new opportunities and creating opportunities, which are important factors in coping with stressful events, are related to post-traumatic growth (Nishi et al. 2010).

Hope is the last variable whose impact on post-traumatic growth was examined in the current study. Results reported in previous studies on hope and post-traumatic growth are consistent with the findings of the present study. Hullmann et al. (2014) examined the relationship between post-traumatic growth and hope in parents of children with cancer and reported that higher hope is associated with higher post-traumatic growth. Salloum et al. (2019) conducted a study on hope and post-traumatic growth. The authors found a moderate positive correlation between hope and post-traumatic growth. Cabral (2010) studied hope and post-traumatic growth among victims of interpersonal violence and found that hope positively predicts post-traumatic growth. Ho et al. (2011) carried out a study examining the roles of hope and optimism on post-traumatic growth and observed a positive correlation between hope and post-traumatic growth. The results of the current study also showed that participants with higher hope experienced higher post-traumatic growth. A possible reason for this result might be that hope is effective in combating diseases or negative life events. Being hopeful is an indication that life goes on and some positive things might happen (Gök and Özdemir 2020).

It is important to note some limitations of the current study. First, this study was conducted assuming that the participants experienced trauma while overcoming Covid-19. Second, this study was conducted online using Google forms via social media networks of Instagram, Facebook, Twitter, WhatsApp, and Telegram with a limited number of participants who overcame Covid-19 from different cities of Turkey. Therefore, the external validity of this study is low. In further studies, researchers might repeat the study with larger samples consisting of survivors of severe Covid-19. Third, a cross-sectional study was designed. Therefore, cause-effect relationships cannot be established with the findings obtained. Finally, the data in this study were limited to the scales Posttraumatic Growth Inventory, State Hope Scale, The Posttraumatic Diagnostic Scale, and Resilience Scale for Adults. Therefore, further studies might obtain data on variables examined in the current study using other instruments and compare them with the current findings.

In conclusion, post-traumatic stress symptoms, resilience, and hope in survivors of the new coronavirus disease (Covid-19) were found to increase post-traumatic growth levels in the current study. Furthermore, post-traumatic growth levels were found

to significantly differ by gender, course of the disease (mild, moderate, critical), and recovery time. Based on the findings and limitations of the study, some recommendations can be made for mental health professionals and researchers in this field. Specialists who are working on survivors of Covid-19 may prepare post-traumatic growth psychoeducation programs that provide positive cognitive, emotional, and behavioral changes to protect these people from the negative effects of the disease. Psychosocial interventions focusing on post-traumatic stress symptoms, resilience, and hope can help people to endure an unknown disease, cope with the trauma caused by this disease, and increase their post-traumatic growth levels. Psychological support can be provided to increase the psychological resilience and hope levels of people who were diagnosed with Covid-19 and survived the moderate or critical disease. Post-traumatic stress symptoms, resilience, and hope-oriented psychosocial interventions can be applied to students or family members who overcome the Covid-19 disease during and after the illness. Further studies may longitudinally examine factors affecting post-traumatic growth in survivors of Covid-19. Since the longitudinal research design examines the progress of a subject over a long period, the factors affecting post-traumatic growth can be determined more clearly.

## References

- Akbar Z, Witruk E (2016) Coping mediates the relationship between gender and posttraumatic growth. *Procedia Soc Behav Sci*, 217:1036-1043.
- Akbaş ÖZ, Dursun C (2020) Koronavirüs (covid-19) pandemisi sürecinde özel alanına kamusal alanı sığdıran çalışan anneler. *Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi*, 7:78-94.
- Alshehri FS, Alatawi Y, Alghamdi BS, Alhifany AA, Alharbi A (2020) Prevalence of post-traumatic stress disorder during the covid-19 pandemic in Saudi Arabia. *Saudi Pharm J*, 28:1666-1673.
- Aşkın R, Bozkurt Y, Zeybek Z (2020) Covid-19 pandemisi: psikolojik etkileri ve terapötik müdahaleler. *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 19:304-318.
- Barthélemy EJ, Thango NS, Höhne J, Lippa L, Koliass A, Germano IM (2020) Resilience in the face of a pandemic: how to bend and not break. *World Neurosurg*, 1-13.
- Bianchini V, Giusti L, Salza A, Cofini V, Cifone MG, Casacchia M (2017) Moderate depression promotes posttraumatic growth (Ptg): a young population survey 2 years after the 2009 L'Aquila earthquake. *Clin Pract Epidemiol Ment Health*, 13:10-19.
- Bo H, Li W, Yang Y, Wang Y, Zhang Q, Cheung T et al. (2021) Posttraumatic stress symptoms and attitude toward crisis mental health services among clinically stable patients with Covid-19 in China. *Psychol Med*, 51:1052-1053.
- Bonanno GA (2004) Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? *Am Psychol*, 59:20-28.
- Büyükoztürk Ş, Çakmak EK, Akgün ÖE, Karadeniz Ş, Demirel F (2016) *Bilimsel Araştırma Yöntemleri*. Ankara, Pegem Akademi.
- Büyükoztürk Ş (2021) *Sosyal Bilimler için Veri Analizi El Kitabı*. Ankara, Pegem Akademi.
- Cabral CM (2010) Psychological functioning following violence: an examination of posttraumatic growth, distress, and hope among interpersonal violence survivors (Master thesis). Toronto, University of Toronto.
- Calhoun LG, Tedeschi RG (2004) Authors' response: the foundations of posttraumatic growth: new considerations. *Psychol Inq*, 15:93-102.
- Cengiz İ, Ergün D, Çakıcı E (2019) Posttraumatic stress disorder, posttraumatic growth and psychological resilience in Syrian refugees: Hatay, Turkey. *Anadolu Psikiyatri Derg*, 20:269-276.
- Chen R, Sun C, Chen J, Jen H, Kang XL, Kao C et al. (2021) A large-scale survey on trauma, burnout, and posttraumatic growth among nurses during the covid-19 pandemic. *Int J Ment Health Nurs*, 30:102-116.
- Chopko BA (2010) Posttraumatic distress and growth: an empirical study of police officers. *Am J Psychother*, 64:55-72.
- Counted V, Pargament KI, Bechara AO, Joynt S, Cowden RG (2020). Hope and well-being in vulnerable contexts during the Covid-19 pandemic: does religious coping matter? *J Posit Psychol*, 1-13.
- Cui PP, Wang PP, Wang K, Ping Z, Wang P, Chen C (2021) Post-traumatic growth and influencing factors among frontline nurses fighting against Covid-19. *Occup Environ Med*, 78:129-135.
- Basım HN, Çetin F (2011) Yetişkinler için psikolojik dayanıklılık ölçeğinin güvenilirlik ve geçerlilik çalışması. *Türk Psikiyatri Derg*, 22:1-12.
- Danışman IG, Uçar CT, Okay D (2018) Eş şiddeti nedeniyle kadın konuklerinde kalmakta olan kadınlarda travma sonrası stres ve travma sonrası gelişimin incelenmesi. *Anadolu Psikiyatri Derg*, 19:537-544.
- Dekel S, Ein-Dor T, Solomon Z (2012) Posttraumatic growth and posttraumatic distress: a longitudinal study. *Psychol Trauma*, 4:94-101.
- Dürü Ç (2006) Travma sonrası stres belirtileri ve travma sonrası büyümenin çeşitli değişkenler açısından incelenmesi ve bir model önerisi (Doktora tezi). Ankara, Hacettepe Üniversitesi.
- Forte G, Favieri F, Tambelli R, Casagrande M (2020) Covid-19 pandemic in the italian population: validation of a post-traumatic stress disorder questionnaire and prevalence of ptsd symptomatology. *Int J Environ Res Public Health*, 17:4151.
- Friborg O, Barlaug D, Martnussen M, Rosenvinge JH, Hjemdal O (2005) Resilience in relation to personality and intelligence. *Int J Methods Psychiatr Res*, 14:29-42.
- Friborg O, Hjemdal O, Rosenvinge JH, Martnussen M (2003) A new rating scale for adult resilience: what are the central protective resources behind healthy adjustment? *Int J Methods Psychiatr Res*, 12:65-76.
- Gales SE (2018) The effects of hope and trauma on self-reported health and well-being (Doctoral thesis). Seattle, Northwest University.
- Garson GD (2012) *Testing Statistical Assumptions*. Asheboro, NC, Statistical Associates Publishing.
- Gök FA, Özdemir EA (2020) Sosyal hizmet uygulamalarında "Umut". *Toplum ve Sosyal Hizmet*, 31:604-617.
- Gökmen G, Deniz ME (2020) Travma sonrası büyümenin yordayıcıları olarak öz-anlayış ve affetme. *Uluslararası Türk Kültür Coğrafyasında Sosyal Bilimler Derg*, 5:72-93.
- Heidarzadeh M, Dadkhah B, Gholchin M (2016) Post-traumatic growth, hope, and depression in elderly cancer patients. *Int J Med Res Health Sci*, 5:455-461.
- Helgeson VS, Reynolds KA, Tomich PL (2006) A meta-analytic review of benefit finding and growth. *J Consult Clin Psychol*, 74:797-816.

- Ho S, Rajandram RK, Chan N, Samman N, McGrath C, Zwahlen RA (2011) The roles of hope and optimism on posttraumatic growth in oral cavity cancer patients. *Oral Oncol*, 47:121-124.
- Hullmann SE, Fedele DA, Molzon ES, Mayes S, Mullins LL (2014) Posttraumatic growth and hope in parents of children with cancer. *J Psychosoc Oncol*, 32:696-707.
- Işık S (2006) Travma sonrası stres belirtileri olan bireylerde olaya ilişkin dikkat yanlılığı, ayrışma düzeyi ve çalışma belleği uzamı arasındaki ilişkiler (Doktora tezi). Ankara, Hacettepe Üniversitesi.
- Janoff-Bulman R (1992) *Shattered Assumptions*. New York, The Free Press.
- Janoff-Bulman R (2006) *Schema-Change Perspectives on Post-Traumatic Growth Handbook of Posttraumatic Growth: Research and Practice*. Mahwah, NJ, Lawrence Erlbaum.
- Jayawickreme E, Infurna FJ (2020) Toward a more credible understanding of post-traumatic growth. *J Pers*, 89:1-4.
- Jeon G, Park S, Bernstein KS (2017) Socio-demographic and psychological correlates of posttraumatic growth among Korean Americans with a history of traumatic life experiences. *Arch Psychiatr Nurs*, 31:256-262.
- Jin Y, Xu J, Liu D (2014) The relationship between post traumatic stress disorder and post traumatic growth: gender differences in PTG and PTSD subgroups. *Soc Psychiatry Psychiatr Epidemiol*, 49:1903-1910.
- Joseph S, Linley PA (2006) Growth following adversity: theoretical perspectives and implications for clinical practice. *Clin Psychol Rev*, 26:1041-1053.
- Kağan M, Güleç M, Boysan M, Çavuş H (2012) Travma sonrası büyüme envanterinin Türkçe versiyonunun normal toplumda hiyerarşik faktör yapısı. *TAF Prev Med Bull*, 11:617-624.
- Kalaitzaki A (2021) Posttraumatic symptoms, posttraumatic growth, and internal resources among the general population in Greece: a nation-wide survey amid the first COVID-19 lockdown. *Int J Psychol*, 56:766-771.
- Karataş Z (2020) Covid-19 pandemisinin toplumsal etkileri, değişim ve güçlenme. *Türkiye Sosyal Hizmet Araştırmaları Dergisi*, 4:3-15.
- Kırşavoglu B (2020) Bipolar bozukluk tanılı hastalar ve bakım verenlerinde psikolojik dayanıklılık, travma sonrası büyüme, bakım veren yükü ve ilişkili faktörlerin incelenmesi (Tıpta uzmanlık tezi). İstanbul, Sağlık Bilimleri Üniversitesi.
- Koroğlu E (2014) *DSM-5 Tanı Ölçütleri El Kitabı*. Ankara, HYB Yayıncılık.
- Lenz AS, Ho C, Rocha L, Aras Y (2021) Reliability generalization of scores on the post-traumatic growth inventory. *Meas Eval Couns Dev*, 54:106-119.
- Mahdi HK, Prihadi K, Hashim S (2014) Posttraumatic growth and resilience after a prolonged war: a study in Baghdad, Iraq. *Int J Eval Res Educ*, 3:197-204.
- Marziliano A, Tuman M, Moyer A (2019) The relationship between post-traumatic stress and post-traumatic growth in cancer patients and survivors: a systematic review and meta-analysis. *Psychooncology*, 29:604-616.
- Miller ED (2020) The Covid-19 pandemic crisis: the loss and trauma event of our time. *J Loss Trauma*, 25:560-572.
- Morrill EF, Brewer NT, O'Neill SC, Lillie SE, Dees EC, Carey LA et al. (2008) The interaction of post-traumatic growth and post-traumatic stress symptoms in predicting depressive symptoms and quality of life. *Psychooncology*, 17:948-953.
- Nishi D, Matsuoka Y, Kim Y (2010) Posttraumatic growth, posttraumatic stress disorder and resilience of motor vehicle accident survivors. *Biopsychosoc Med* 4:7.
- Ogińska-Bulik N (2015) The relationship between resiliency and posttraumatic growth following the death of someone close. *Omega (Westport)*, 71:233-244.
- Özcan NA (2019) Yetişkinlerde travma sonrası stres ve öz duyarlılığın travma sonrası büyüme üzerindeki yordayıcı rolü. *Uluslararası Toplum Araştırmaları Dergisi*, 14:621-642.
- Özcan NA, Arslan R (2020) Travma sonrası stres ile travma sonrası büyüme arasındaki ilişkide sosyal desteğin ve maneviyatın aracı rolü. *Elektronik Sosyal Bilimler Dergisi*, 19:299-314.
- Özçetin YS, Hiçdurmaz D (2017) Posttraumatic growth and resilience in cancer experience. *Psikiyat Güncel Yaklaşımlar*, 9:388-397.
- Rahat E, İlhan T (2016) Coping styles, social support, relational self-construal, and resilience in predicting students' adjustment to university life. *Educational Sciences: Theory and Practice*, 16:187-208.
- Rutter M (2007) Resilience, competence, and coping. *Child Abuse Negl*, 31:205-209.
- Salloum A, Bjoerke A, Johnco C (2019) The associations of complicated grief, depression, posttraumatic growth, and hope among bereaved youth. *Omega (Westport)*, 79:132-136.
- Seidm Mahmoodi J, Rahimi C, Mohamadi N (2011) Resiliency and religious orientation: factors contributing to posttraumatic growth in Iranian subjects. *Iran J Psychiatry*, 6:145-150.
- Sexton MB, Byrd MR, Kluge SV (2010) Measuring resilience in women experiencing infertility using the CD-RISC: examining infertility-related stress, general distress, and coping styles. *J Psychiatr Res*, 44:236-241.
- Shamia NA, Thabet AAM, Vostanis P (2015) Exposure to war traumatic experiences, post-traumatic stress disorder and post-traumatic growth among nurses in Gaza. *J Psychiatr Ment Health Nurs*, 22: 749-755.
- Sherr L, Nagra N, Kulubya G, Catalan J, Clucas C, Harding R (2011) HIV infection associated post-traumatic stress disorder and post-traumatic growth - a systematic review. *Psychol, Health Med*, 16:612-629.
- Snyder CR, Harris C, Anderson JR, Holleran SA, Irving LM, Sigmon ST et al. (1991) The will and the ways: development and validation of an individual-differences measure of hope. *J Pers Soc Psychol*, 60:570-585.
- Solomon Z, Dekel R (2007) Posttraumatic stress disorder and posttraumatic growth among Israeli ex-pows. *J Trauma Stress*, 20:303-312.
- Ssenyonga J, Owens V, Olema DK (2013) Posttraumatic growth, resilience, and posttraumatic stress disorder (PTSD) among refugees. *Procedia Soc Behav Sci*, 82:144-148.
- Sun W, Chen W, Zhang Q, Ma S, Huang F, Zhang L et al. (2021) Post-traumatic growth experiences among COVID-19 confirmed cases in China: a qualitative study. *Clin Nurs Res*, 30:1079-1087.
- Swickert R, Hittner J (2009) Social support coping mediates the relationship between gender and posttraumatic growth. *J Health Psychol*, 14:387-393.
- Tamiolaki A, Kalaitzaki AE (2020) "That which does not kill us, makes us stronger": Covid-19 and posttraumatic growth. *Psychiatry Res*, 289:113044..
- Tarhan S, Bacanlı H (2015) Sürekli umut ölçeği'nin Türkçe'ye uyarlanması: geçerlik ve güvenilirlik çalışması. *The Journal of Happiness & Well-Being*, 3:1-14.
- Tedeschi RG, Calhoun LG (1996) The posttraumatic growth inventory: measuring the positive legacy of trauma. *J Trauma Stress*, 9:455-471.
- Weinberg M, Besser A, Zeigler-Hill V, Neria Y (2016) Bidirectional associations between hope, optimism and social support, and trauma-related symptoms among survivors of terrorism and their spouses. *J Res Pers*, 62:29-38.

Wu K, Zhang Y, Liu Z, Zhou P, Wei C (2015) Coexistence and different determinants of posttraumatic stress disorder and posttraumatic growth among Chinese survivors after earthquake: role of resilience and rumination. *Front Psychol*, 6:1043.

Xie Y, Wu J, Shen G (2019) Posttraumatic growth in Tibetan adolescent survivors 6 years after the 2010 Yushu earthquake: depression and PTSD as predictors. *Child Psychiatry Hum Dev*, 51:94-103.

Ye Z, Yang X, Zeng C, Li X, Wang Y, Shen Z et al. (2020) Resilience, social support, and coping as mediators between covid-19-related stressful experiences and acute stress disorder among college students in China. *Appl Psychol: Health Well Being*, 12:1074-1094..

Yıldız E (2021) Posttraumatic growth and positive determinants in nursing students after COVID-19 alarm status: a descriptive cross-sectional study. *Perspect Psychiatr Care*, 57:1876-1887.