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The Moderator Roles of Depression and Anxiety Symptoms in the Relationship Between Posttraumatic Stress Disorder and Posttraumatic Growth in Syrian Refugees

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Purpose: Traumatic events not only lead to negative consequences such as posttraumatic stress disorder (PTSD) but are also associated with positive results such as psychological growth and maturity. This paper aimed to examine the moderating effect of depression and anxiety symptoms on the relationship between PTSD and posttraumatic growth (PTG). ***Method:*** The participants were 630 adult Syrian refugees ($M_{age} = 31.83$, $SD = 9.71$; 218 were male and 412 were female) who migrated to Türkiye after the civil war in Syria. They completed the Posttraumatic Stress Disorder Checklist, the Posttraumatic Growth Inventory, the Patience Health Questionnaire, and the Generalized Anxiety Disorder Questionnaire. A double moderation model was tested to investigate the potential moderation roles of depression and anxiety symptoms in the relationship between PTSD symptoms and PTG. ***Results:*** The rates of getting above the cutoff score on PTSD, depression, and anxiety scales were 28.6%, 34.9%, and 29.7%, respectively. Depression and anxiety symptoms moderated the relationship between PTSD and PTG: For individuals scoring higher in depression compared to those scoring lower in depression, high PTSD scores were related to substantially lower PTG scores. A similar effect was observed for anxiety symptoms: high anxiety scores were associated with lower PTG scores, especially when PTSD scores were high. ***Conclusion:*** These findings highlight the importance of addressing depression and anxiety symptoms in the relationship between PTG and PTSD in refugees.

Clinical Impact Statement
The results are important for identifying the factors affecting posttraumatic growth as a result of a traumatic experience. Moreover, the effect of depression and anxiety disorders associated with a traumatic event on the individual's development of a positive perspective was investigated.

Keywords: posttraumatic growth, depression, anxiety, posttraumatic stress disorder

The Syrian civil war that started in 2011 has generated the biggest refugee crisis of this century. With 3,426,719 registered Syrian refugees, Türkiye is the world's largest recipient of refugees from Syria (United Nations High Commissioner for Refugees, 2023). Refugees are often exposed to various potentially traumatic events such as physical/sexual assault, torture, natural disasters, lack of shelter or nutrition, and victimization during premigration and resettlement (Bhui et al., 2003; Georgiadou et al., 2018). Refugees also face challenging experiences after resettlement, including economic problems, language barriers, social isolation, and discrimination (Kira et al., 2010, 2023; Um et al., 2015). All these potentially traumatic events and stressful situations lead to a considerable risk of mental health problems such as depression, anxiety, and posttraumatic stress disorder (PTSD; Blackmore et al., 2020; Giacco et al., 2018). Studies conducted among refugees in Türkiye also show that mental health problems are prevalent (e.g., Acarturk et al., 2018; Alpak et al., 2015; Kaya et al., 2019). Acarturk et al. (2021) reported rates of anxiety, depression, and PTSD for Syrian refugees settled in Türkiye of 36.1%, 34.7%, and 19.6%, respectively.

Distressing events can lead to negative outcomes, but they can also lead to positive changes, an experience called posttraumatic growth (PTG; Cordova & Andrykowski, 2003). PTG is a positive psychological transformation experienced due to the struggle with extraordinary stressful life events (Tedeschi & Calhoun, 2004). PTG is not a single phenomenon but rather a collection of aspects of psychological growth, maturity, and transformation (Kangaslampi et al., 2022). Previous studies have found that PTG may occur in various populations who experienced traumatic events, including war (Tsai et al., 2015), HIV infection (Finkelstein-Fox et al., 2020), natural disaster (Amiri et al., 2021), disease (Vazquez et al., 2021), and other life-changing events.

The Relationship Between PTSD, PTG, Depression, and Anxiety

A number of recent studies have investigated the relationship between mental health and PTG. Some studies have demonstrated

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that poorer mental health is related to lower levels of PTG (Gianinazzi et al., 2016; Mystakidou et al., 2008; Yun et al., 2010), while other studies showed positive associations between mental health problems and PTG (Liu et al., 2017; Rabinowitz et al., 2023). Some studies of PTSD and PTG have proposed a curvilinear association between PTG and PTSD, where higher scores of PTG are associated with mild PTSD symptoms and lower PTG scores are associated with high and low PTSD symptoms (e.g., Andreou et al., 2021; Kleim & Ehlers, 2009; Shand et al., 2015). Zhou et al. (2018) used latent profile analysis to identify patterns of co-occurrence of PTSD and PTG in a sample of adolescent earthquake victims and reported three clusters of co-occurrence: a "growth" cluster (high in PTG, low in PTSD symptoms), a "flexible" cluster (low in both PTG and PTSD), and a "symptom and growth" cluster (high in both PTG and PTSD). In addition, mediators or moderators may impact the strength or direction of the relationship between PTSD and PTG. For instance, resilience (Vieselmeyer et al., 2017), self-efficacy (Jian et al., 2023), social support (Bellur et al., 2018), rumination (Xu et al., 2022), and narcissistic tendencies (Levi & Bachar, 2019) tend to be associated with higher PTG.

Positive and negative consequences of trauma such as mental health problems (e.g., depression, anxiety, or PTSD) and PTG may co-occur (Eisma et al., 2019; Marziliano et al., 2020; Schneider et al., 2019). Tedeschi and Calhoun (2004) suggested that trauma-related distress can activate a range of coping strategies as individuals struggle with negative consequences following a traumatic event. This may lead to PTG by helping the individual reframe their understanding of self, others, and the world after the trauma (Zhou et al., 2015).

Depression and anxiety are common after traumatic events (Frazier et al., 2009). Although the comorbidity of depression and anxiety is high, the distinction between them has been well established (Clark & Watson, 2013). An intriguing question that has emerged in the literature is how these mental health problems affect the development of PTG. For instance, Shand et al. (2015) conducted a meta-analysis of PTG in cancer survivors and found a modest negative link between PTG and depression, but no relationship between PTG and anxiety symptoms. In a longitudinal study, Dekel et al. (2012) found that baseline PTSD symptoms predicted subsequent PTG levels, while baseline depression and anxiety levels did not predict subsequent PTG levels. In another study, Eisma et al. (2019) reported that individuals with moderate anxiety, depression, and PTSD had the highest levels of PTG, while those with lower or higher symptom levels of depression and anxiety had less PTG. Li et al. (2021) examined the relationship between PTG, depression, and anxiety using latent class analysis and observed no differential relationships between PTG and depression or anxiety. In sum, the findings of studies examining the relationship between PTG, PTSD, depression, and anxiety have not sufficiently mapped these relationships and their mechanisms.

The Present Study

The lack of consensus among studies examining the relationship between depression, anxiety, PTSD, and PTG demonstrates key gaps in the understanding of these relationships. Additionally, few studies have examined PTSD, PTG, anxiety, and depression in refugee populations. The unique challenges faced by refugees such as forced displacement, exposure to violence, loss of loved ones, and cultural adjustment difficulties mean this population's mental health needs are both pressing and distinct from other populations. Therefore, investigating the factors in the development of PTG, which is a protective factor for mental health, in a highly traumatized refugee population is crucial. The present study investigated the moderator roles of depression and anxiety symptoms in the relationship between PTSD and PTG in a traumatized refugee group. A conceptual diagram of the double mediation model is presented in Figure 1.

Method

Participants and Procedure

Participants were 630 adult Syrian refugees. Their age range was 19–55 years ($M_{age} = 31.83$, $SD = 9.71$), 218 were men (34.6%), and 412 (65.4%) were women; 239 (37.9%) were single, 314 (49.8%) were married, 13 (2.1%) were divorced, and 64 (10.2%) were widowed. Participants had been residing in Türkiye for an average of 6.82 years.

The data were collected from Mersin, a province with one of the largest Syrian refugee populations in Türkiye. It was collected by three native Arabic-speaking research assistants between November 21, 2022 and February 18, 2023. Inclusion criteria for study participants were (a) migrated to Türkiye after the civil war in Syria that started in 2011 and (b) over 18 years old. This study was approved by Mersin University's Social Sciences Ethics Committee. An informed consent form was obtained from all participants.

Measurements

Sociodemographic Form

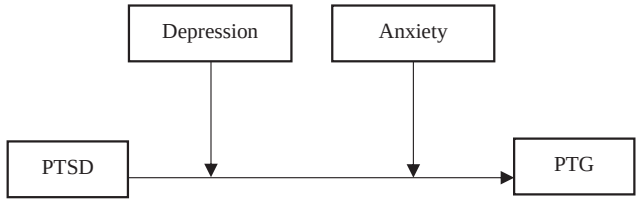
The researcher prepared and administered a form to determine participants' age, gender, education level, and marital status.

Posttraumatic Stress Disorder Checklist for DSM-5 *(PCL-5)*

The PCL-5 was developed to assess PTSD symptom severity in the past month, as per the *DSM-5* (Blevins et al., 2015). The scale consists of 20 items and four dimensions (intrusion/re-experiencing, avoidance, negative alterations in cognition and mood, and arousal and reactivity) that reflect symptom clusters in the *DSM-5*. Each item was rated on a 4-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). A higher score on the PCL-5 indicates more pronounced PTSD symptoms. The cutoff score of PCL-5 to diagnose

Figure 1

A Conceptual Diagram of Moderating Effects of Anxiety and Depression Symptoms



Note. PTSD = posttraumatic stress disorder; PTG = posttraumatic growth.

an individual as having PTSD is ≥33. In this study, Cronbach's alpha internal consistency score was .91.

Posttraumatic Growth Inventory (PTGI)

The PTGI was developed to assess PTG in individuals (Tedeschi & Calhoun, 1996). The PTGI consists of 21 items and five dimensions of PTG (relating to others, new possibilities, personal strength, spiritual change, and appreciation of life). Each item is rated on a 6-point Likert scale (from 0 = *I did not experience this change as a result of my crisis* to 5 = *I experienced this change to a very great degree as a result of my crisis*). For this study, the scale's total score was used, and the PTGI showed excellent reliability (Cronbach's $\alpha = .96$).

Nine-Item Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a self-report scale developed to evaluate the presence and severity of depressive symptoms over the past 2 weeks (Kroenke et al., 2001). The scale consists of nine items that are rated on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Total scores range from 0 to 27, with higher scores indicating depressive symptoms. PHQ-9 scores can be divided into five categories, where a cutoff point of 0–4 indicates no depressive symptoms, 5–9 mild depressive symptoms, 10–14 moderate depressive symptoms, 15–19 moderately severe depressive symptoms, and 20–27 severe depressive symptoms. We used a cutoff score of 11 for the presence of depression as suggested by Manea et al.'s (2012) meta-analysis. Sawaya et al. (2016) translated the PHQ-9 into Arabic. In the present study, the PHQ-9 was found to have good reliability (Cronbach's $\alpha = .90$).

Seven-Item Generalized Anxiety Disorder Questionnaire (GAD-7)

The GAD-7 is a self-report measurement tool to evaluate the severity of generalized anxiety disorder symptoms (Spitzer et al., 2006). The scale consists of seven items rated on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly every day*). GAD-7 scores can be divided into four categories, where 0–4 indicates no anxiety symptoms, 5–9 mild, 10–14 moderate, and scores greater than 15 indicate severe anxiety symptoms. The GAD-7 is a widely used measure of general anxiety symptoms in various populations. The psychometric properties of the GAD-7 were approved by several studies (e.g., Rutter & Brown, 2017; Sapra et al., 2020). We used a cutoff score of 11 for the diagnosis of anxiety as recommended by Plummer et al.'s (2016) meta-analysis. Sawaya et al. (2016) translated GAD-7 into Arabic. The Cronbach's alpha internal consistency score for the GAD-7 was .92 in the current study.

Statistical Analysis

An investigation of missing data in the data set found no more than 25% missing in each item; therefore, no participants were excluded. Missing data were completed via estimated using maximum likelihood estimation procedures (Graham, 2009). Second, the normality assumption was tested via skewness and kurtosis scores. Skewness and kurtosis coefficients of all variables ranged between +2 and −2 (George & Mallery, 2010), which was assumed to exhibit a normal distribution. Descriptive statistics of PTSD, PTG, depression, and anxiety scores were calculated. Cutoff scores for PTSD, depression, and anxiety scores were transformed into categorical variables for prevalence analysis, and the continuous variables of the scores were used in the moderation analysis.

The relationships between PTSD, PTG, depression, and anxiety symptoms were examined by the Pearson's correlation method. Finally, a double moderation analysis method was used to evaluate the moderation effects of depression and anxiety on the relationship between PTSD symptoms and PTG. This analysis was conducted using PROCESS 3.5 macro (Model 2). Statistical significance was set at .05, and SPSS (Version 21) was used for these analyses.

Results

Preliminary Analyses

Means, standard deviations, and correlations for PTSD, PTG, depression, and anxiety symptoms are presented in Table 1.

Bivariate correlations showed that PTG is statistically significantly associated with PTSD ($r = .345$, $p < .01$), depression ($r = .396$, $p < .01$), and anxiety ($r = .344$, $p < .01$). PTSD was found to be linked to both depression ($r = .628$, $p < .01$) and anxiety ($r = .582$, $p < .01$). Finally, depression and anxiety were correlated with each other ($r = .594$, $p < .01$).

Prevalence and comorbidity rates of PTSD, anxiety, and depression in Syrian refugees are displayed in Table 2. The prevalence of PTSD, depression, and anxiety disorders in Syrian refugees was 28.6%, 34.9%, and 29.7%, respectively. Moreover, the rate of comorbidity of PTSD–anxiety, PTSD–depression, and depression–anxiety was 2.9%, 6.2%, and 5.9%, respectively, while the rate of co-occurrence of the three disorders was 16.5%.

Figure 2 shows an Euler plot of the prevalence rates of PTSD, anxiety, and depression.

Moderation Analysis

The moderation of anxiety and depression in the association between PTSD symptoms and PTG was tested, and the findings of the double moderation analysis showed that the model was significant, $F(5, 630) = 75.30$, $p < .001$. Moreover, PTSD, depression, and anxiety explained 37% of the variance in PTG. The results indicated that anxiety and depression have independent and statistically significant moderator effects in the relationship between PTSD symptoms and PTG. The addition of the interaction between PTSD and depression symptoms improved the model: $F(1, 630) = 40.04$, $p < .001$, R^2 change = .040. The addition of the interaction between PTSD and anxiety symptoms also improved the model: $F(1, 630) = 8.37$, $p = .0037$, R^2 change = .008. Moreover, including both

Table 1
Descriptive Statistics and Correlations of the variables

Variables	*M*	*SD*	1	2	3	4
1. PTG	39.72	28.23	—	.345**	.396**	.344**
2. PTSD	20.99	19.56	—	—	.628**	.582**
3. Depression	8.00	6.56	—	—	—	.594**
4. Anxiety	6.62	5.81	—	—	—	—

Note. PTG = posttraumatic growth; PTSD = posttraumatic stress disorder.
** $p < .001$.

Table 2
Prevalence and Comorbidity of PTSD, Depression, and Anxiety Symptoms in Syrian Refugees

Variable	Category	*n*	%
PTSD	Meet criteria (score ≥33)	180	28.6
	Meet only PTSD criteria	36	6
Depression	Meet criteria	220	34.9
	Meet only depression criteria	40	6.3
Anxiety	Meet criteria	187	29.7
	Meet only anxiety criteria	28	4.9
Comorbidity	PTSD–anxiety	18	2.9
	PTSD–depression	39	6.2
	Depression–anxiety	37	5.9
	Comorbidity in three conditions	104	16.5

Note. PTSD = posttraumatic stress disorder.

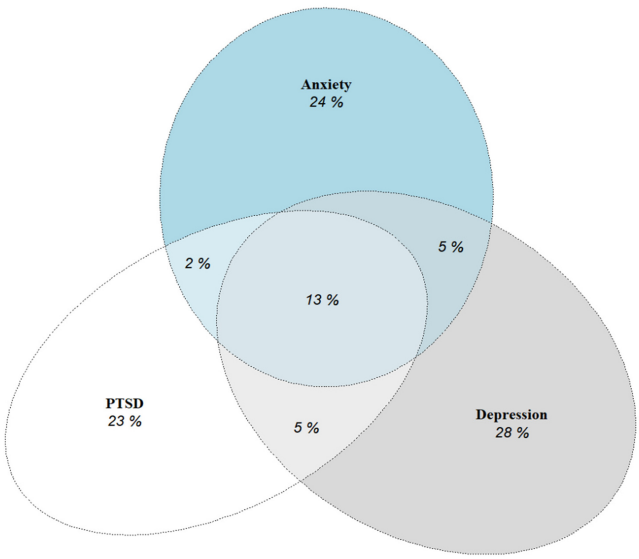
interactions gave an $F(2, 630) = 62.05$, $p < .001$, R^2 change = .1240. The results of the double moderation analysis are displayed in Table 3.

An evaluation of the interaction plots (see Figure 3) showed that in the low-depression, low-anxiety condition, PTG increased with PTSD symptoms. In the average-depression condition, similar to other conditions, a low-anxiety level increases the relationship between PTG and PTSD. However, in the high-depression condition, none of the anxiety levels play a significant role in the relationship between PTG and PTSD.

Discussion

This study aimed to understand the moderator effects of depression and anxiety in the association between PTSD and PTG in a traumatized refugee population. To the best of our knowledge, this is the first study that examined the effects of depression and anxiety symptoms on the association between PTSD and PTG. We conclude that depression and anxiety symptoms, both separately and together, moderated the relationship between PTSD and PTG. When depression was high, high PTSD was related to substantially lower PTG scores than when depression scores were low. Similarly, high anxiety scores were associated with lower PTG scores, especially when PTSD scores were high.

Figure 2
Euler Plot for Anxiety, Depression, PTSD, and Comorbidity Rates



Note. PTSD = posttraumatic stress disorder. See the online article for the color version of this figure.

In this study, the mean PTGI score was 39.72 ($SD = 28.23$), which can be regarded as a moderate level of PTG. In some other studies examining the PTG rates of Syrian refugees, the average scores were between 49.11 and 62.30 (Ersahin, 2022; Özdemir et al., 2021; Rizkalla & Segal, 2018; Wen et al., 2020).

This study found prevalence rates of depression and anxiety of 34.9% and 29.7%, respectively. These prevalence rates are in line with other estimates for Syrian refugees (e.g., Naal et al., 2021; Poole et al., 2018; Sharif-Esfahani et al., 2022). For instance, a study with Syrian refugees in Sweden (Tinghög et al., 2017) reported depression and anxiety prevalence as 40.2% and 31.8%, respectively. Acarturk et al. (2021) reported that mental health problems are highly prevalent among Syrian refugees in Türkiye; their study indicated 36.1% and 34.7% prevalence rates for depression and anxiety. A review study examining the prevalence of anxiety disorder among Syrian refugees (Peconga & Høgh Thøgersen, 2020) reported a prevalence of 26.6% (range: 19.30%–31.8%) on average. A study of 352 adult Syrian refugees who settled in Türkiye found a PTSD prevalence of 33.5% (Alpak et al., 2015). In the present study, PTSD prevalence was found to be 28.6%. The variation between these prevalence rates across studies may be related to postmigration conditions, individual differences, host country regulations, the multiplicity of traumatic events experienced by refugees, and their sociodemographic characteristics. This study was carried out 12 years after the start of the Syrian civil war, when the prevalence of mental health problems such as depression, anxiety, and PTSD among refugees was still relatively high.

In terms of the relationships among the variables, findings showed a positive and significant association among depression, PTSD, anxiety, and PTG. Previous studies have reported contradictory findings about this association. Some studies (Dekel et al., 2012) reported no association between depression or anxiety symptoms and PTG. Findings of another study conducted with Syrian refugees in Türkiye (Özdemir et al., 2021) showed that PTGI scores were negatively related to depression scores. Results of longitudinal studies (e.g., Jenewein et al., 2008; Jörngården et al., 2007) have shown that both high and low levels of anxiety and low levels of depression are related to PTG. This contradiction may be related to other factors influencing the relationship between PTG and PTSD. For instance, the results of a meta-analysis (Liu et al., 2017) indicated that PTG might be positively associated with PTSD symptoms and that this correlation may be affected by the type of traumatic event.

Unexpectedly, we observed that higher depression and anxiety scores are associated with more PTG, but only when PTSD is low. One possible explanation is based on Tedeschi and Calhoun's (2004) suggestion that mental health problems and PTG coexist, but that the dosage of variables may affect this relationship. As noted in previous studies (e.g., Kleim & Ehlers, 2009; Wen et al., 2020), this may also be due to the curvilinear relationship between mental health problems and PTG. According to Calhoun and Tedeschi (2006), distress may activate the cognitive processes of trauma survivors. This activation may lead to a more positive view

Table 3

Regression Results for the Moderating Effects of Depression and Anxiety on the Association Between Posttraumatic Stress and Posttraumatic Growth

Variables	Estimate	*SE*	*t*	95% CI	
				LL	*UL*
Constant	10.47**	1.76	5.93	7.01	13.94
PTSD	1.13**	0.1084	10.49	0.92	1.34
Anxiety	2.31**	0.3636	6.35	1.59	3.02
PTSD × Anxiety	−0.0579**	0.0091	−6.32	−0.076	−0.039
Depression	1.322**	0.4038	.3.27	0.52	2.11
PTSD × Depression	−0.0311**	0.0107	−.291	−0.052	−0.010

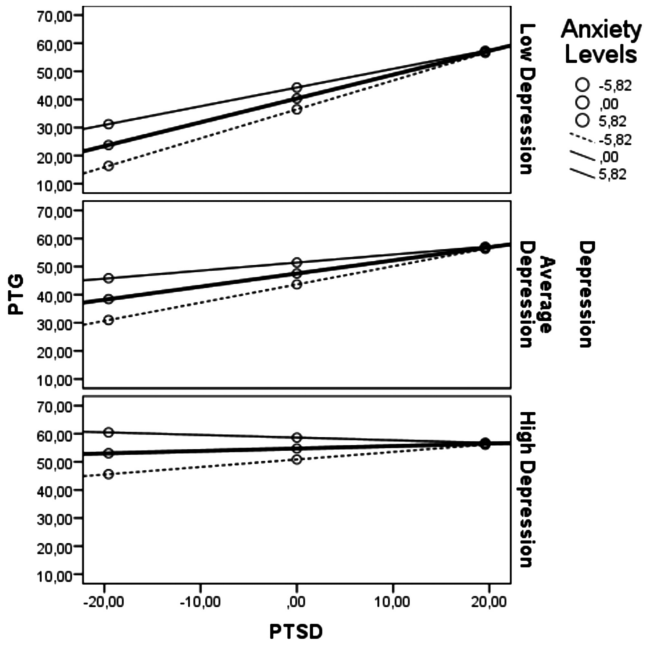
Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit; PTSD = posttraumatic stress disorder.
** $p < .001$.

of themselves, others, and the world, resulting in PTG. However, mental health problems, especially depression, may prevent to development of a positive view.

The present study has several limitations. First, the relationships between PTG and mental health problems (PTSD, depression, and anxiety) were analyzed by the Pearson correlations method. However, such a method cannot establish a causal relationship between the variables. This problem may be the reason for the inconsistent results regarding the relationships discussed. Second, this study assessed mental health problems with self-report questionnaires, which are known to inflate prevalence estimates compared to diagnostic interviews (Charlson et al., 2019). For future studies, we recommend that mental health problems be assessed with clinician-administered diagnostic interviews. Third, this study examined these relationships in a refugee group, and findings may not be generalizable to other populations; future research should examine different traumatized groups. Fourth, cultural factors may have influenced the findings of the study. Cultural factors such as religious beliefs, social support, and cultural norms can shape refugees' responses to traumatic events (Ellis et al., 2019; George, 2010; Schlechter et al., 2021). For instance, Kroo and Nagy (2011) reported that religiosity and perceived social support were positively associated with PTG in traumatized Somali refugees. Lastly, the high prevalence of mental health problems found in refugees 12 years after the beginning of the war demonstrates the long-term effects of trauma. However, the complex nature of the trauma experienced by the refugees presents a challenge for researchers examining specific trauma-related phenomena. Migration is a multifaceted event, and postmigration factors also affect individuals' traumatic experiences and play an essential role in mental health problems (Chen et al., 2017; Jannesari et al., 2020). These factors may contribute to differences in the manifestation of symptoms and the overall trajectory of recovery. Researchers must consider these complexities when interpreting the results.

Figure 3

Depression and Anxiety Symptoms Moderating the Relationship Between PTSD and PTG



Note. PTSD = posttraumatic stress disorder; PTG = posttraumatic growth.

Conclusion

PTG is a positive outcome that can develop after a traumatic experience. The current study adds evidence of the relationship between PTSD and PTG in a highly traumatized refugee group. This result is significant in terms of explaining the relationship between PTSD and PTG, especially since depression and anxiety show high comorbidity with PTSD. Considering that PTG is an important factor for psychological adjustment, depression, and anxiety symptoms should also be one of the focal points of treatment, especially in patients with relatively less severe or fewer PTSD symptoms.

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