Investigation of the Relationships between Post-Traumatic Growth, Intolerance to Uncertainty, and Psychological Inflexibility in Adults

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Abstract

The aim of this research is to examine the levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility in adult individuals and to explain the nature of the relationship between them. The study is a quantitative research and was conducted using correlational research design. The Post-Traumatic Growth Inventory, Intolerance to Uncertainty Scale (12), Acceptance and Action Questionnaire-II (AAQ-II), and Personal Information Form (PIF) were used in the research. The relationships between variables were examined using correlation, linear regression analysis, and t-test. A statistically significant and negative relationship was found between post-traumatic growth and both intolerance to uncertainty and psychological inflexibility; significant and positive relationship was found between post-traumatic growth and age. Additionally, it was found that intolerance to uncertainty and psychological inflexibility are significant predictors of post-traumatic growth.

Keywords: post-traumatic growth, intolerance to uncertainty, psychological inflexibility

Introduction

People experience many different situations throughout their lives that can affect their life processes positively or negatively. Individuals develop various coping skills to deal with these negative experiences. Traumatic experiences, which contribute to the development of coping skills, include experiences such as tragic death, sexual assault, exposure to natural disasters, and direct or indirect exposure to another person's traumatic experience (Horasanlı, 2023). The American Psychiatric Association (2013) defines traumatic experiences as events that threaten individuals' life integrity and involve a real risk of death that individuals have experienced or witnessed. Trauma can lead to a process rather than just an outcome. Individuals who experience trauma undergo certain positive or negative changes in their lives. Yalom (2023) mentioned in his 1992 work that the German philosopher Nietzsche stated, "What does not kill me makes me stronger." This expression is defined in psychological literature with the concept of post-traumatic growth and refers to the development and change that individuals exhibit in various areas such as positive and meaningful relationships, increased psychological resilience and self-concept, and existential and spiritual transformations following challenging life struggles (Tedeschi & Calhoun, 2004). Although the concept of post-traumatic growth is as old as human history and has been discussed by philosophers, various belief systems, and social scientists throughout history, it was not explicitly defined until the 1990s. In the 1990s, studies in

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Positive Psychology increased, and as a result of these studies, it was suggested that there is positive development in individuals' potentials following traumatic experiences; strong and positive transformations occur in their emotional, cognitive, and behavioral systems (Seligman & Csikszentmihalyi, 2000).

One of the skills that individuals develop as a result of post-traumatic growth is psychological flexibility. Psychological flexibility, which has been a frequently discussed concept in psychology studies in recent years, is primarily explained with six components (acceptance, being present, cognitive defusion, self as context, values, committed action). Individuals with psychological flexibility do not strive to change their emotions and thoughts; they live in the moment, accept their past experiences, and continue their lives in a way that is detached from negative thoughts (Aslan & Turk, 2022). The concept of psychological inflexibility is explained as the exact opposite of the concept of psychological flexibility.

The concept of psychological inflexibility is explained in the literature as a component of Acceptance and Commitment Therapy (ACT). Psychological inflexibility is primarily explained with six components (lack of contact with the present moment, experiential avoidance, cognitive fusion, the domination of a conceptualized self, lack of values, inaction). Individuals with high levels of psychological inflexibility often exhibit avoidance behaviors to escape the inner distress and negative thoughts resulting from adverse experiences. Their behavioral repertoires are quite limited, and they tend to engage in behavior patterns that reinforce negativity. Additionally, they may have tendencies toward substance abuse and self-harm (Uğur et al., 2021; Yavuz, 2015).

Some studies have shown a linear relationship between psychological inflexibility and intolerance to uncertainty. Intolerance to uncertainty is explained as the discomfort and feeling of being at risk experienced by individuals when faced with an uncertain situation, accompanied by a desire to avoid it (Carleton, 2012). It has been found that individuals with high levels of psychological inflexibility and intolerance to uncertainty have lower levels of well-being and psychological well-being (Uludağ, 2023). Various studies have examined the relationship between intolerance to uncertainty and psychological well-being, and a negative relationship has been identified between the two variables. Accordingly, it can be suggested that individuals with high levels of intolerance to uncertainty are at risk of compromised psychological well-being (Erguvan, 2015).

Purpose of the Study

The purpose of this research is to examine the relationship between post-traumatic growth and the variables of intolerance to uncertainty and psychological inflexibility, as well as to determine whether post-traumatic growth, intolerance to uncertainty, and psychological inflexibility scores differ according to gender and marital status. Accordingly, the research questions have been formulated as follows:

- To what extent are adults' levels of post-traumatic growth predicted by their levels of intolerance to uncertainty and psychological inflexibility?
- Do adults' levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility show significant differences according to gender and marital status?

Method

Research Model

This research is a study in the correlational research model, which examines the relationships between adults' levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility. The relational research model is used to determine whether or to what extent a relationship exists between two or more variables (Karasar, 2017). The dependent variable of the study is the scores obtained from the Post-Traumatic Growth Inventory, while the independent variables are the scores obtained from the Intolerance to Uncertainty Scale and the Acceptance and Action Questionnaire-II, along with age, gender, and marital status.

Study Group

The participants consist of 298 volunteer adults from all regions of Turkey who were included in the study through online data collection in 2024. Of the participants, 230 are women (77.2%), and 68 are men (22.8%); 229 are married (76.8%), and 69 are single (23.2%). The average age of the participants is calculated to be 25.94. Participants were selected using the convenience sampling method, which is primarily used to minimize the loss of money, time, and labor (Büyüköztürk et al., 2019).

Data Collection Instruments

Data in the study were collected using the Post-Traumatic Growth Inventory, Intolerance to Uncertainty Scale (IUS-12), Acceptance and Action Questionnaire-II, and Personal Information Form (PIF).

Post-Traumatic Growth Inventory

In this study, the short form of the Post-Traumatic Growth Inventory (PTGDI-X-SF), developed by Platte et al. in 2023, was used to determine participants' levels of post-traumatic growth. The scale was adapted into Turkish by Türk and Batmaz (2023). It consists of 10 items and is unidimensional. It is evaluated on a 6-point Likert scale ranging from 0 to 5. The scale has no reverse items. The Cronbach's alpha internal consistency coefficient was determined to be .81.

Intolerance to Uncertainty Scale (IUS-12)

The Intolerance to Uncertainty Scale (IUS-12) was used to determine the participants' levels of intolerance to uncertainty. The scale was developed by Carleton, Norton, and Asmundson (2007) and adapted into Turkish by Sarıçam et al. in 2014. It consists of two sub-dimensions, includes 12 items, and is evaluated on a 5-point Likert scale. The general internal consistency coefficient of the scale is .88; the internal consistency coefficient of the prospective anxiety sub-dimension is .84, and that of the inhibitory anxiety sub-dimension is .77. Sarıçam et al. (2014) determined the Cronbach's alpha internal consistency coefficient of IUS-12 to be .84 for the entire scale. For the sub-dimensions, the Cronbach's alpha internal consistency coefficient was determined to be .83 for the inhibitory anxiety sub-dimension and .75 for the prospective anxiety sub-dimension.

Acceptance and Action Questionnaire-II

The Acceptance and Action Questionnaire-II (AAQ-II) was used in this study to determine participants' levels of psychological inflexibility. The Acceptance and Action Questionnaire was developed by Hayes

et al. (2004) to determine individuals' levels of psychological flexibility. The scale consists of 16 items. High scores on the scale indicate low levels of psychological flexibility and high levels of psychological inflexibility. Due to the high internal consistency of the scale, it was revised by the developers into the 7-item AAQ-II, evaluated on a 7-point Likert scale. The test-retest reliability of the scale, conducted with a sixty-day interval, was calculated to be .81. The scale was adapted into Turkish by Yavuz et al. (2016). It is unidimensional, and the Cronbach's alpha internal consistency coefficient was determined to be .84.

Personal Information Form (PIF)

The Personal Information Form is a short form prepared by the researchers to determine the participants' age, gender, and marital status.

Data Analysis

The obtained data were analyzed using the SPSS 29.00 package program. The data collected from the "Post-Traumatic Growth Inventory," "Acceptance and Action Questionnaire-II," and "Intolerance to Uncertainty Scale (IUS-12)" inventories via an online form were transferred to the SPSS program for analysis. A multiple linear regression analysis was applied to determine the prediction of adults' post-traumatic growth levels by their levels of intolerance to uncertainty and psychological inflexibility. Additionally, an independent samples t-test was conducted to determine whether participants' levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility differ by gender and marital status. Pearson correlation coefficient analysis was also applied to determine the relationship between participants' levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility.

Findings

The normality test for the variables of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility was conducted using the Kolmogorov-Smirnov test, and it was observed that the data were normally distributed (p>0.05). Descriptive statistical values such as mean, standard deviation, skewness, and kurtosis for these variables are shown in Table 1.

Table 1

Descriptive Statistics

Variable	Skewness	Kurtosis	Mean	Sd	Min	Max
Post-traumatic growth	-,166	,095	34,06	6,42	13	50
Intolerance to uncertainty	-,159	-,209	41,12	8,66	17	60
Psychological inflexibility	,092	-,709	26,91	9,61	7	49

The Pearson correlation coefficients calculated to determine the relationship between the relevant variables are presented in Table 2.

Table 2

Pearson Correlation Coefficients

Variable	Post-traumatic growth	Intolerance to uncertainty	Psychological inflexibility
Post-traumatic growth	-		
Intolerance to uncertainty	-,345**	-	
Psychological Inflexibility	-,336**	,470**	-
Age	,220**	-,110	-,116*

When examining Table 2, a statistically significant and negative relationship is observed between the dependent variable, post-traumatic growth, and both intolerance to uncertainty (r= -.34) and psychological inflexibility (r= -.33). In contrast, the relationship between the dependent variable and age (r= .22) is found to be statistically significant and positive (p<.01). Therefore, as the participants' age increases, their levels of post-traumatic growth also increase; however, as post-traumatic growth increases, the levels of intolerance to uncertainty and psychological inflexibility decrease. Similarly, the relationship between intolerance to uncertainty and psychological inflexibility is found to be statistically significant and positive (p<.01). Accordingly, it can be stated that as the level of intolerance to uncertainty increases, the level of psychological inflexibility also increases.

The Extent to Which Adults' Levels of Intolerance to Uncertainty and Psychological Inflexibility Are Predicted by Their Level of Post-Traumatic Growth

The multiple linear regression analysis regarding the prediction of the level of post-traumatic growth by the levels of intolerance to uncertainty and psychological inflexibility is shown in Table 3.

Table 3

Multiple Linear Regression Analysis for the Prediction of Post-Traumatic Growth Level

Variable	B	S_e	β	t	p
Constant	45.4	1.68		27.012	.000

Intolerance to uncertainty	-.178	.045	-.240	-3.963	.000
Psychological inflexibility	-.149	.040	-.223	-3.686	.000
R= 0.397, R^2= 0.158; F= 27.621, p= .000					

When examining the regression analysis results provided in Table 3, it is found that the regression analysis model is statistically significant (F = 27.621, p< .001). Intolerance to uncertainty and psychological inflexibility together explain 15% of the total variance in post-traumatic growth level. When examining the t-test results regarding the statistical significance of the regression model, it is seen that intolerance to uncertainty and psychological inflexibility are significant predictors of post-traumatic growth.

Differences According to Gender

The differences in participants' levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility based on gender were examined using an independent samples t-test, and the findings are presented in Table 4.

Table 4

T-Test Findings According to Gender Groups

	Gender	N	$\bar{x}$	Sd	t	df	p
Post-traumatic growth	Female	230	34.32	6.26	1.228	101.5	.222
	Male	68	33.17	6.92			
Intolerance to uncertainty	Female	230	41.39	8.59	.975	106.5	.332
	Male	68	40.20	8.90			
Psychological inflexibility	Female	230	26.81	9.02	-.355	119.2	.723
	Male	68	27.26	8.91			

In Table 4, the differences in the mean scores of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility based on the gender of the participants are shown. When examining the average levels of post-traumatic growth concerning the gender variable, the average score for female participants is 34.32, while for male participants, it is 33.17 (t=1.228, p>0.05), indicating no statistically

significant difference between the groups. Regarding the difference in the variable of intolerance to uncertainty based on the participants' gender, the average for female participants is calculated to be 41.39, while for male participants, it is 40.20 (t=0.975, p>0.05). Consequently, it has been determined that the level of intolerance to uncertainty does not show a statistically significant difference in terms of the participants' gender. Similarly, the average levels of psychological inflexibility do not show a statistically significant difference based on the participants' gender (t=-0.355, p>0.05).

Differences According to Marital Status

The differences in participants' levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility based on marital status were examined using an independent samples t-test, and the findings are presented in Table 5.

Table 5

T-Test Findings According to Marital Status

	Marital Status	N	$\bar{x}$	Sd	*t*	df	*p*
Post-traumatic growth	Single	229	33.49	6.38	-2.827	113.7	
	Married	69	35.94	6.27			.006
Intolerance to uncertainty	Single	229	41.53	8.55	1.468	108.3	
	Married	69	39.75	8.93			.145
Psychological inflexibility	Single	229	27.52	9.35	1.907	104.5	
	Married	69	24.89	10.23			.059

The differences in participants' levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility based on marital status are shown in Table 5. When examining the table, it is observed that the level of post-traumatic growth significantly differs according to the marital status of the participants (t= -2.827, p<0.05). The average scores of intolerance to uncertainty do not show a significant difference based on marital status (t= 1.468, p>0.05). Similarly, the levels of psychological inflexibility do not show a statistically significant difference based on the participants' marital status (t= 1.907, p>0.05).

Discussion

This study investigated the relationship between post-traumatic growth and the levels of intolerance to uncertainty and psychological inflexibility. A review of the literature shows that the current research findings are supported by various studies. Uludağ (2023) found a significant and positive relationship between intolerance to uncertainty and psychological inflexibility in his study on childhood depression. Since the sample in this study consists of adults, the same analysis result is supported for adults. However, since the average age of the participants is calculated to be 25.94, this limits the generalizability of the findings to the entire adult period. It was observed that the participants' post-traumatic growth, intolerance of uncertainty and psychological rigidity levels did not show a statistically significant difference according to gender. In a study conducted by Belge (2019), no statistically significant difference was found between individuals' gender and intolerance of uncertainty levels. Similarly, in the study conducted by Acar (2022), no statistically significant difference was found between psychological rigidity and gender. However, according to Gökahmetoğlu (2021), post-traumatic growth levels differed by gender, and accordingly, women's post-traumatic growth levels were observed to be higher than men's post-traumatic growth levels, and this was confirmed by this study. This study can form the basis for investigating levels in different age groups. In addition, statistical significance was determined according to the marital status of the participants. According to the study, married individuals have higher post-traumatic growth levels than single individuals. This can be explained by the fact that starting a family brings with it many positive factors, both individually and socially. Because establishing satisfying and meaningful relationships positively affects psychological health (Marks & Lambert, 1998). In his studies, Çimen (2020) did not observe a relationship between individuals' marital status and post-traumatic growth levels. On the contrary, a different study concluded that being married predicts the level of post-traumatic growth (Şakiroğlu, 2019). Based on this situation, it is seen that the relationship between individuals' marital status and post-traumatic growth varies according to research. The average levels of post-traumatic growth and intolerance to uncertainty were relatively higher for female participants than for male participants. Based on the findings, it was concluded that adults' levels of post-traumatic growth, intolerance to uncertainty, and psychological inflexibility do not show significant differences based on gender and marital status. It was also concluded that adults' levels of post-traumatic growth are significantly predicted by their levels of intolerance to uncertainty and psychological inflexibility.

The results obtained should be interpreted in terms of the study's limitations and shortcomings. First, the current study was conducted with individuals whose experience of a traumatic event is unknown. The use of the convenience sampling method affects the generalizability of the findings. The results of the current research are based solely on the participants' self-reports. Therefore, the study is likely to contain methodological biases. For this reason, the results of this study should be interpreted within the context of the society in which it was conducted. Additionally, the current study is based on a cross-sectional design. Cross-sectional data can not provide evidence of causality between the examined variables. In future studies, it may be useful to repeat the research with individuals who have experienced traumatic events to better understand the relationship between post-traumatic growth, intolerance to uncertainty, and psychological inflexibility.

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