



## RESEARCH ARTICLE

# Factors Affecting Posttraumatic Growth Among College Students

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### Abstract:

#### Background:

College students experience emotional trauma and post-traumatic growth throughout their lives. However, there are few studies that identified the types of traumatic events, and the factors contributing to their positive growth through events among college students.

#### Objective:

The purpose of the present study was to investigate factors affecting posttraumatic growth among college students.

#### Methods:

The study is a cross-sectional descriptive survey, and measured the traumatic events experienced, distress, big five personality factors (neuroticism, extroversion, openness, agreeableness, conscientiousness), deliberate rumination, and posttraumatic growth on 305 college students. To find out the influencing factors on the posttraumatic growth, multiple regression analysis was performed.

#### Results:

The constructed model for posttraumatic growth showed that statistically significant explanatory variables were religion, deliberate rumination, agreeableness, neuroticism, and extroversion and the model including these variables has 43.1% explanatory power on posttraumatic growth ( $F=45.33$ ,  $p<.001$ ).

#### Conclusion:

It is necessary to carry out the assessment and intervention of psychological state after the traumatic accidents of college students. In addition, it is needed to develop an intervention program that they utilize their spirituality and characteristics and use deliberate rumination.

**Keywords:** Posttraumatic Growth, Rumination, College Students, Health problems, Suicide attempts, Negative emotions.

## 1. INTRODUCTION

College entrance offers students new educational and social opportunities, but many undergraduates experience stress and psychological symptoms, such as anxiety and depression, during their time as college students [1, 2]. The greatest sources of stress for undergraduates are academic and job-related problems; other stressors include financial problems, values, relationships with faculty and family, and romantic and friendship problems [3]. Stress has effects on undergraduates' mental health [4], and their vulnerability to mental health problems manifests as relationship problems, poor grades, low graduation rates, suicide attempts, and self-injurious behaviors [5, 6]. Therefore, it is important to help undergraduates who are exposed to factors that precipitate negative emotions and are vulnerable to mental health problems, cope with negative experiences.

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Personal experiences that cause psychological pain can be referred to as psychological traumatic, which not only includes exposure to wars and natural disasters but also to threatening incidents or experiences that disrupt one's way of life [7]. Traditionally, research on traumatic experiences have been based on pathological models, such as Post-Traumatic Stress Disorder (PTSD) and have focused on facilitating recovery to pre-traumatic levels of functioning, as well as the prevention and treatment of trauma-induced injuries [8]. However, it has been postulated that individuals can reap positive psychological outcomes even from experiencing traumatic events that induce irreversible functional damage, beyond mere recovery, by achieving positive and transcendental transformations [9]. In this context, Tedeschi and Calhoun [10] have referred to the positive changes beyond pre-traumatic functioning that occur because of individuals' struggles in crises, as Post-Traumatic Growth (PTG), and developed a PTG model. PTG is a multidimensional concept that is manifested in various ways, including a general sense of increased personal strength, the identification of new possibilities, more meaningful relationships with others, spiritual changes and an increased appreciation for life [10].

In the past, the focus of PTG research was on its occurrence, but recently, the focus is shifting to the reasons and causes of the growth experienced by various individuals [11]. According to the PTG model of Calhoun and Tedeschi [12], individuals who experience trauma will be challenged with respect to the concepts that constitute the individual such as the meaning, value, goals, and belief systems of life, and engulfed in confusion and stress. According to the previous studies, college students experience traumatic events such as natural disasters, wars, accidents [13, 14], diseases, and death [15, 16]. There was, however, a report stating that an individual's perception and coping are more important than the event itself because the experience of a traumatic event is subjective [17]. Studies on college students reported the characteristics of an individual's personality and psychology such as optimistic personality [18, 19] and the levels of psychological pain [20] as factors influencing PTG. Subjects who have positive coping mechanisms or optimistic and positive characteristics adjust more smoothly to critical situations in life and experience a high level of psychological well-being and psychological growth [21]. In addition, the more the individuals perceive severe pain, the more will they attempt to understand the event better, to escape from such pain [22], and growth occurs [23]. A repeated investigation is needed, however, since there was a study [24] that showed that if the perceived level of pain is high due to invasive thoughts, the possibility of experiencing PTSD rather than PTG is high.

In addition, a study [16] showed that trauma is restructured to have a positive result in one's life and influences PTG through deliberate rumination, which is repetitive and goal-oriented thinking that makes people realize how much they have changed and grown even in psychological pain. Individual's experience of the traumatic event is different depending on their rumination and interpretation of it, and deliberate rumination changes individual's attitude toward not only the traumatic event but also overall life, and such changes can lead to PTG [25].

Accordingly, the present study identified traumatic events that threaten the lives of undergraduate students and investigated the influence of traumatic events. In addition, the present study attempted to provide useful basic data for developing nursing interventions for the PTG of college students by identifying the protective factors that lead to the PTG of college students by confirming factors (general characteristics, personality traits, psychological pain, and deliberate rumination) that influence PTG.

## **2. MATERIAL AND METHODS**

### **2.1. Research Design**

This study was a quantitative cross-sectional descriptive survey designed to identify the extent of PTG and its relevant factors (general characteristics, personality traits, psychological pain, and deliberate rumination) among undergraduates.

### **2.2. Research Participants**

Undergraduate students attending E and H University in Korea were enrolled in this study. The sample size required for this study was calculated to be 263, using G\*Power 3.1 [26], with an effect size of 0.05, power of 0.8,  $\alpha$  of 0.05, and 5 predictors. Based on this calculation, we set our target sample size to be 293, assuming a 10% dropout rate. Our questionnaires were distributed to 310 students; after excluding the data from five students that were inappropriate for the analysis, data from the remaining 305 students were included in the final analysis.

## 2.3. Research Tool

### 2.3.1. General Characteristics

Age, sex, grade, and religion were measured by general characteristics. Age and grade were measured as continuous variables and religion was measured as presence or absence.

### 2.3.2. Experience of a Traumatic Event

This study measured individuals' traumatic experiences using the "List of 12 Traumatic Events" developed in Korea [27], based on the list of events suggested by Tedeschi and Calhoun [10]. This list includes "accidents with casualties, such as traffic accidents, natural disasters, and man-made disasters that one has experienced or witnessed," "shock from betrayal, such as fraud, lies, or deceit," and "a serious illness, such as cancer or health-related issues, such as surgery, experienced by oneself or a significant other." Participants were instructed to check one event that applied to themselves and to describe the event. They were told to write about the most shocking event they had experienced.

### 2.3.3. Big Five Personality Traits

Personality traits were classified based on the big-five personality model: neuroticism, extraversion, openness, agreeableness, conscientiousness [28]. Neuroticism defined as tendency to be prone to psychological stress; extraversion defined as seeking stimulation in the company of others, and talkativeness; openness defined as the extent to which a person is imaginative or independent and depicts a personal preference for a variety of activities over a strict routine; agreeableness defined as tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others; conscientiousness defined as tendency to be organized and dependable, show self-discipline, act dutifully, aim for achievement, and prefer planned rather than spontaneous behavior [28]. Personality, which develops over time based on various experiences, refers to the characteristic ways of thinking and the emotions and behavioral patterns that distinguish one person from another [29]. These are personality factors believed to be consistent and long term as opposed to state, which are temporary and situational. These traits were measured using the International Personality Item Pool that was originally developed by Buchanan, Goldberg, and Johnson [30] and adapted by Yoo, Lee, and Ashton [31]. The scale has 10 items that measure each of the five traits, for a total of 50 items. Higher scores indicate that personality traits are stronger. The reliability (Cronbach's  $\alpha$ ) of the scale in a previous study [32] was 0.86 for neuroticism, 0.86 for extroversion, 0.75 for openness, 0.73 for agreeableness, and 0.78 for conscientiousness, and the reliability (Cronbach's  $\alpha$ ) of the scale in this study was 0.87 for neuroticism, 0.87 for extroversion, 0.75 for openness, 0.80 for agreeableness, and 0.77 for conscientiousness.

### 2.3.4. Psychological Pain

Psychological pain refers to an individual's subjective evaluation or experience of trauma, hypothesized the extent of a person's perceived helplessness, uncontrollability, and a threat to life [33]. In this study, a 0–10 visual analog scale was used to measure perceived post-traumatic psychological pain.

### 2.3.5. Deliberate Rumination

Deliberate rumination refers to repetitive and purposeful thinking that is focused on overcoming the traumatic event [10]. In this study, deliberate rumination was measured using the Korean version of the Event-Related Rumination Inventory (K-ERRI) [34], which is a Korean-translated and adapted version of the ERRI originally developed by Cann *et al.* [35]. The K-ERRI measures intrusive and deliberate rumination. This study only measured the latter variable, which refers to repeated voluntary and intentional thinking about one's traumatic experience and oneself. The scale for deliberate rumination consists of 10 items, with each item rated on a 4-point scale, from 0 "not at all" to 3 "frequently." The total score ranges from 0 to 30, and a higher score indicates more frequent deliberate rumination. The reliability (Cronbach's  $\alpha$ ) of the scale in a previous study was .88 [34], and in this study, it was 0.92.

### 2.3.6. Post-Traumatic Growth (PTG)

In this study, PTG was measured using the Korean version of the Post-traumatic Growth Inventory (K-PTGI) [27]. The K-PTGI is a 16-item scale consisting of four factors: changes in self-perception, increased depth of interpersonal relationships, discovery of new possibilities, and changes in spiritual and religious interests. Each item is rated on a 6-point scale, from 0 "not at all" to 5 "very often." The total score ranges from 0 to 80, and a higher score indicates greater PTG. The reliability (Cronbach's  $\alpha$ ) of the scale in a previous study [27] and the present study was 0.92.

**2.4. Data Collection**

Data were collected from undergraduate students attending 2 Universities in Korea, from November 2, 2016 to November 24, 2016. The researcher explained the study’s objectives and the questionnaire items to students enrolled in chapel class after obtaining approval from the minister in charge of the chapel class. Chapel classes were chosen because they comprised all liberal arts classes, regardless of participant major. To respect the ethical rights of the participants, the fact that research participation was voluntary and that survey contents would be used only for the purpose of the research was explained. Those who understood the objectives of this study and agreed to participate filled out the consent form, and the survey was conducted among them. It took participants an average of 10-15 minutes to complete the questionnaire. The questionnaires were then submitted in a collection box.

**2.5. Ethical Considerations**

Appropriate measures were taken to protect participants against coercion or unjust influence during the recruitment or consent process. Only those who voluntarily agreed to participate could fill out the questionnaire; an explanation of the research purposes and the questionnaire was provided. It was made clear to the students that they had the freedom to not participate in this research, that there were no advantages or disadvantages resulting from their participation in this research, and that they could quit at any time even if they had agreed to participate. The participation agreement included a statement about protecting the participants’ anonymity and confidentiality, and explained that participating in this research would have no impact on their grades etcetera.

**2.6. Data Analysis**

The collected data were analyzed using the IBM SPSS 20.0 program. The participants’ general characteristics, big-five personality traits, psychological pain, use of deliberate rumination, and PTG are presented as frequencies and percentages and means and standard deviations. For those who checked two or more events of PTG, only the event that the participant described in detail was included in the analysis. When two events were described in detail, both events were included in the analysis. Participants’ PTG and deliberate rumination in relation to their general characteristics were analyzed using the t-test and one-way Analysis of Variance (ANOVA). Correlations among the variables were analyzed using the Pearson’s correlation coefficient. Multiple regression was performed using the variables measuring participants’ general characteristics and those found to be significantly correlated with PTG in the ANOVA to identify the effects of the independent variables on PTG.

**3. RESULTS**

**3.1. Post-Traumatic Growth and Deliberate Rumination in Relation to Participants’ General Characteristics**

The participants’ general characteristics are as follows. Their mean age was 20.22 ± 1.61 years. The vast majority of the participants (224, 73.4%) were female students. The largest number of participants consisted of second-year students (158, 51.8%) and most students had no religion (187, 61.3%). The mean degree of psychological pain was 7.63 ± 1.88 (range = 0-10). In terms of PTG in relation to participants’ general characteristics, those with a religion showed significantly greater PTG than those without one (t = 3.04, p = .003). There were no significant differences in PTG in relation to age, gender, grade, and the degree of psychological pain.

In terms of deliberate rumination in relation to general characteristics, students with a psychological pain score of 8 or higher engaged in more frequent deliberate rumination than those with a score below 8 (t = -2.09, p = .037). There were no significant differences in deliberate rumination in relation to age, gender, grade-level, or religion (Table 1).

**Table 1. Differences of outcome variables by characteristics of the participants (N=305).**

Characteristics	n (%) or M±SD	Posttraumatic Growth M±SD	t or F (p)	Deliberate Rumination M±SD	t or F (p)
Age (year)	<20	107 (35.1)	0.65(.516)	25.00±7.52	1.81(.071)
	≥20	198 (64.9)		26.65±7.57	
	20.22±1.61				
Gender	Male	81 (26.6)	-0.66(.510)	24.80±7.39	-1.77(.078)
	Female	224 (73.4)		26.53±7.62	

Characteristics		n (%) or M±SD		Posttraumatic Growth M±SD	t or F (p)	Deliberate Rumination M±SD	t or F (p)
Grade	1	105	(34.4)	51.11±16.53	2.55(.080)	25.37±7.47	2.81(.062)
	2	158	(51.8)	49.62±15.92		25.87±7.68	
	4	42	(13.8)	56.02±16.41		28.57±7.14	
Religion	No	187	(61.3)	48.79±15.47	3.04(.003)	25.58±7.81	1.41(.158)
	Yes	118	(38.7)	54.55±17.29		26.84±7.18	
Distress	<8	115	(37.7)	50.59±14.50	-0.37(.711)	24.91±7.47	-2.09(.037)
	≥8	190	(62.3)	51.27±17.50		26.77±7.58	
		7.63±1.88					
Total	M±SD			51.01±16.41		26.07±7.58	

**3.2. Event-Related Features**

Of the 305 respondents, 382 events were reported, and 77 respondents had two types of events. The most frequent type of event experienced by the students was academic and task problems, such as experiencing failure or frustration about a test (78, 25.6%). This type was followed by interpersonal relationship problems, such as a severed friendship or a romantic breakup (76, 24.9%), death of a significant other (47, 15.4%), and maladjustment problems, such as being alienated or bullied at school, in society, or in the military (41, 13.4%), and betrayal, such as fraud, lies, or deceit (30, 9.8%) (Table 2).

**Table 2. Descriptive statistics of events (N=305).**

Variables	n (%)
Academic achievement problems (e.g. fail, frustration, etc.)	78 (25.6)
Interpersonal relationship problem (e.g. end a relationship, farewell, broken-hearted)	76 (24.9)
Death of a meaningful person	47 (15.4)
Problems on social adjustment (e.g. school, social, military, isolation, bully)	41 (13.4)
Betrayal (e.g. fraud, lie, cheat)	30 (9.8)
Serious illness: one's own or meaningful person (e.g. cancer, surgery, related health)	24 (7.9)
Parents' separation or divorce	23 (7.5)
Failing examination or job search	18 (5.9)
Accident injuries: one's own or witness (e.g. car accident, disaster, human cause disaster)	17 (5.6)
Crime victim: one's own or witness (e.g. sexual violence, attack, robbery, etc.)	13 (4.3)
Economic loss (e.g. bankruptcy, economic crisis)	8 (2.6)
The others	7 (2.3)

**3.3. Correlations Among PTG, Deliberate Rumination, Psychological Pain, And Personality Traits**

The mean PTGI score was 51.01 (range: 0-80). The mean score for deliberate rumination was 26.07 (range: 0-30). The mean big-five scores were 31.52 for neuroticism, 30.58 for extroversion, 31.60 for openness, 34.30 for agreeableness, and 34.43 for conscientiousness (Table 3).

Table 3 Shows the correlations between PTG and the other variables. PTG had a positive correlation with deliberate rumination (r = .558, p < .001), extroversion (r = .340, p < .001), openness (r = .136, p = .017), agreeableness (r = .374, p = .004), and conscientiousness (r = .269, p < .001), but a negative correlation with neuroticism (r = -.176, p = .002).

**Table 3. Correlation of outcome variables (N=305).**

Variables	M±SD	Min, Max	Posttraumatic Growth	Deliberate Rumination	Neuroticism	Extroversion	Openness	Agreeableness	Conscientiousness
	r (p)								
Posttraumatic growth	51.01±16.41	16,96	1.00(<.001)	-	-	-	-	-	-
Deliberate rumination	26.07±7.58	10,40	.558(<.001)	1.00(<.001)	-	-	-	-	-
Neuroticism	31.52±7.41	12,49	-.176(.002)	-.057(.322)	1.00(<.001)	-	-	-	-
Extroversion	30.58±7.18	10,50	.340(<.001)	.201(<.001)	-.107(.062)	1.00(<.001)	-	-	-
Openness	31.60±5.31	15,48	.136(.017)	.126(.028)	-.120(.035)	.325(<.001)	1.00(<.001)	-	-
Agreeableness	34.30±5.56	15,50	.374(.004)	.165(.004)	-.094(.100)	.489(<.001)	.316(<.001)	1.00(<.001)	-

(Table 3) contd....

Variables	M±SD	Min, Max	Posttraumatic Growth	Deliberate Rumination	Neuroticism	Extroversion	Openness	Agreeableness	Conscientiousness
	r (p)								
Conscientiousness	34.43±5.70	14,50	.269(<.001)	.221(<.001)	-.139(.015)	.327(<.001)	.236(<.001)	.362(<.001)	1.00(<.001)

### 3.4. Variables That Affect PTG

In order to identify the factors that affect PTG, we performed a multiple regression analysis with religion, which has been shown to vary significantly in relation to PTG, and deliberate rumination and personality traits, which were found to be significantly correlated with PTG, as the explanatory variables. With regard to the basic assumptions of regression analysis, residual normality was established, and the absence of multi-collinearity among the independent variables was confirmed with a tolerance of 0.74-0.98 and a variance inflation factor in the range of 1.02-1.35. The results of the analysis showed that religion, deliberate rumination, agreeableness, neuroticism, and extroversion were statistically significant, and explained 43.1% of the variance in PTG (F = 45.33, p < .001) (Table 4).

Table 4. Multiple regression analysis of participants' posttraumatic growth (N=305).

Variables	B	S. E.	β	t (p)	R <sup>2</sup>	F (p)
Intercept	0.75	6.06	-	0.12 (.902)	0.431	45.33 (<.001)
Religion*	3.85	1.48	0.11	2.60 (.010)		
Deliberate rumination	1.04	0.10	10.77	10.77 (<.001)		
Agreeableness	0.65	0.15	0.22	10.77 (<.001)		
Neuroticism	-0.27	0.10	-1.22	-2.78 (.006)		
Extroversion	0.26	0.12	0.11	2.25 (.025)		
* Dummy Variable; Religion: Have=1, Not have=0						

## 4. DISCUSSION

The present study aimed to identify the types of traumatic events and PTG experienced by college undergraduates, and factors that affect PTG using structured questionnaires. The most frequent type of trauma reported was academic and task-related; other frequent events included interpersonal problems, such as severed friendships and romantic breakups, and the death of a significant other, which is partially consistent with the findings of a study of American and Japanese undergraduates [18]. In that study, interpersonal and academic problems and accidents with casualties were some of the most frequent events. Among the Korean undergraduates, academic and task-related problems were the most frequent traumatic events, whereas interpersonal relationship problems were common across countries. Similar to a previous study's finding that most undergraduates experience stress, anxiety, and depression [2], and that a high proportion of American undergraduates are exposed to traumatic events [36].

In this study, it was founded that the college undergraduates had a relatively high level of psychological pain caused by various traumatic events, with a mean score of 7.63. However, psychological pain didn't affect PTG significantly. In a previous research on disaster survivors [37], an assertion which some level of psychological pain is necessary for PTG to develop has been supported. But, there were also studies that higher levels of psychological pain were more likely to suffer PTSD symptoms than PTG [24]. Therefore, a longitudinal study is needed to identify the effect of psychological pain level on PTG according to the duration from traumatic events. In addition, trauma is a subjective concept [17], and individuals' psychological pain should not be overlooked, even if the trauma is not a major incident, such as a natural disaster requiring active intervention.

The degree of PTG in this study was 3.19, on average, which is comparable to that (3.58) reported among American undergraduates [36] and 3.56 among Hispanic adolescents [38]. An analysis of the factors that affect PTG revealed that religion, deliberate rumination, agreeableness, neuroticism, and extroversion were significant PTG predictors. First, having a religion had a positive effect on PTG, which is consistent with previous reports [38, 39]. We speculate that religion or spirituality had a positive effect on achieving growth in a new dimension, as supported by the findings of a previous study, which reported that spiritual factors helped individuals discover meaning in trauma and had features of internality and transcendence [40]. Therefore, interventions for promoting PTG should also consider the spiritual aspects of individuals.

The findings of this study showed that agreeableness, neuroticism, and extroversion were the characteristic traits associated with PTG. Being agreeable or extroverted had a positive effect on PTG, and being neurotic had a negative

effect on PTG. These results were similar to previous reports [12, 33] that extroversion and openness to new experiences play a positive role in PTG. The finding that extroversion and agreeableness had positive effects on PTG supports previous findings that the experience of intimate relationships through emotional acceptance, instead of comprehensive social support, has a positive effect on PTG [41]. The result of this study also supports the finding of another study in which a positive association was found between PTG and those who reported staying in touch with someone who had overcome a similar difficulty [42]. Our findings also support those of a report that people with many opportunities to guide supportive relationships with others in their network demonstrate a high degree of growth [43], and they are consistent with a report that revealing oneself to others requires the use of active cognitive processes. However, people who experience inappropriate or uninterested responses from others when they express themselves are likely to have fewer opportunities to talk about their feelings; they tend to engage in the cognitive processes less actively and have lower PTG [44].

Agreeableness refers to the degree to which one trusts and respects others and maintains good relationships with them [45]. Extroversion is a basic quality needed in interpersonal relationships, and being highly extroverted motivates individuals to be social, which affects their social adjustment [45]. Therefore, agreeableness and extroversion are strongly related to social support and openness to experience [45]. On the other hand, the finding that high neuroticism had a negative impact on PTG is similar to the findings from previous studies that people with higher neuroticism experience a higher level of burnout [46]. Neurotic people are characterized by being worrisome, tense, depressed, anxious, low-spirited, meticulous, and easily angered [45], and these traits may hamper PTG.

People who engaged in deliberate rumination more frequently demonstrated greater PTG, which supports the finding of a positive relationship between deliberate rumination and PTG [16], and supports the argument that deliberate rumination enables one to contemplate, understand, and discover the potential benefits and meaning of a traumatic event [12].

Approximately 93.5% of college undergraduates who have been victims of school violence cited the need for a PTG program and information about improving their self-esteem, stress management, and interpersonal relationships, as well as the treatment of, and recovery from trauma [47].

The limitation of this study is that generalization of the findings should be made with caution, as the data were collected from undergraduate students attending two schools in specific regions. Follow-up studies should investigate more variables that might affect PTG and use samples that are more diverse. Second, this study was cross-sectional, causality and direction of relationships could not be determined. Therefore, prospective cohort studies that address the affecting factors of posttraumatic growth over time are also recommended.

## **CONCLUSION**

This finding suggests that college students perceive traumatic events as painful experiences in their lives and wish to overcome them. Therefore, society should pay attention to college students' traumatic experiences and develop programs to help them overcome trauma. A traumatic event is not confined to negative experiences that lead to psychological maladjustment and disorders. If students are offered proper help, trauma can serve as an impetus for change, where students can achieve higher levels of maturity that transcend their pre-trauma states. They can alter their traditional points of view to find a deeper meaning in life and achieve psychological growth. Therefore, it is important to help college students overcome traumatic events and attain growth, which should equip them with the ability to overcome challenges they are bound to face in the future.

## **ETHICS APPROVAL AND CONSENT TO PARTICIPATE**

Not applicable.

## **HUMAN AND ANIMAL RIGHTS**

No animals/humans were used for studies that are the basis of this research.

## **CONSENT FOR PUBLICATION**

Not applicable.

## CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declared none.

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