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Patterns of traumatic events and its relations with posttraumatic growth and religiosity in Iranian college students

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Abstract:

BACKGROUND: Traumatic events and psychological damage are common. Identifying different types of traumatic events contributes to the development of psychopathology and can be very helpful in macroeducational and treatment planners. The current study extracted the patterns (overlap) of different traumatic events that Iranian college students commonly experience, with the aim of understanding their association with posttraumatic growth (PTG) and religiosity.

MATERIALS AND METHODS: Four hundred and sixty-six students from Kerman universities completed a cross-sectional survey about religion, and questions about PTG and traumatic events have experienced in the past 5 years. The latent class analysis (LCA) was used for extracting patterns of traumatic events, and the one-way ANOVA test was used to compare PTG and religiosity across these classes in Iranian college students.

RESULTS: The LCA revealed that a three-class solution had an adequate relative and absolute fit. The three classes were labeled and characterized as multiple-traumatic events (2.9%), intermediate-traumatic events (31.1%), and low-traumatic events (66.0%). In ANOVA results for PTG and Duke University Religion Index (DUREL) domains across classes, individuals in the multiple-traumatic classes had the lowest score of PTG and DUREL domains.

CONCLUSION: Although the current study showed the relative frequency of multiple-traumatic events in Iranian students is low, individuals categorized in this class had the lowest PTG, and these findings reveal the necessitation of planning and interventions for PTG.

Keywords:

Latent class analysis, posttraumatic growth, religion, traumatic events

Introduction

Today, the rate of exposure to traumatic events such as natural disasters (earthquakes and floods), chronic diseases, car accidents, loss of family members, and the like is increasing in the world.[1-3] The probability of being exposed to such traumatic events has been estimated to be 50%–60%.[4] Traumatic events are becoming more prevalent around the world through natural initiatives and human catastrophes.[5] Identifying different types of traumatic events qualitatively has been one of the fields of research among researchers.[6] This may determine which types of trauma contribute to the development of psychopathology.[7] Some studies have shown that people who experience interpersonal violence develop traumatic pathology more rapidly than those who experience noninterpersonal violence.[6] Therefore, having a pattern of traumatic events can be very helpful in macroeducational and treatment planners.

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For the reason that traumatic events can cause many psychological problems such substance abuse, physical injuries, and psychological complications[8]. It is expected that there is a significant difference between the groups considered for events in terms of psychological consequences after traumatic events. These psychological complications can include negative psychological consequences and mental disorders such as depression, substance abuse, and posttraumatic stress disorder (PTSD) in exposed individuals.[9] However, it should be noted that most of the survivors do not develop PTSD but have reported personal growth after exposure to traumatic events.[10,11] Tedeschi and Calhoun used the term posttraumatic growth (PTG) for this personal growth or positive experience, that include improved interpersonal relationships, increased appreciation of life, increased sense of personal strength and self-confidence, positive changes in priorities and goals, and spiritual and religious changes.[12] Tedeschi and Calhoun argued that the "seismic nature" of traumatic events may play an important role in PTG, which is characterized by various aspects of controllability or uncontrollability, irreversibility, and threatening qualities.[11] Previous studies have also shown that the nature of traumatic events determines their impact on coping strategies.[13,14] Therefore, the type of trauma may affect the incidence of PTG. Linley and Joseph found that PTSD symptoms were negatively correlated with positive changes following sexual assault but positively associated with PTG of Oklahoma City bombing survivors.[15]

It should be mentioned that religiosity keeps the religious person secure and strong in many troubles and tensions of life by creating a strong intellectual cohesion and worldview.[16] In a study, Overcash *et al*. showed that religiosity and religion provide a framework for understanding and coping with trauma.[17] Bowland, Edmond, and Fallot found that spiritually based interventions were effective in reducing trauma symptoms in the studied elderly and injured women.[18] Another study also reported that women who were exposed to traumatic events expressed more commitment and devotion to religion than those who did not experience any traumatic event.[19] Another study conducted in the city of Mashhad in Iran showed providing pastoral care of pregnant women with preeclampsia risk of postpartum reduces stress disorder.[20]

Although some of previous studies examined the association traumatic events and religious[21,22] and PTG, there is very few studies of the relationship between the pattern of traumatic events and PTG and religious indicators among college students. Due to the importance of the mental health of young people, the present study was aimed to determine the pattern of traumatic events and its relationship with religiosity and PTG among Iranian students.

Study design and setting

The data were collected from a cross-sectional study by the cluster sampling in Iran, Kerman, between April and June 2020. Researchers sampled students, and data were collected in randomly selected classrooms proportional to the size of the university. A sealed box was placed in the middle of the classroom before distributing the questionnaires, we explained about the aim of the study, and the students were ensured regarding the anonymity and intractability of the questionnaires. The questionnaires were self-administered. The only enrolling criterion was willingness to participate in the study, and those under age 18 years were excluded from the study.

Study participants and sampling

The participants were 466 undergraduate college students that were called up from Shahid Bahonar University, Kerman University of Medical Sciences, Islamic Azad University Kerman Branch, and ACECR Science and Application University. Questionnaire items including potentially traumatic events, the Persian Posttraumatic Growth Inventory (P-PTGI)-short form, and the Persian version of the Duke University Religion Index (P-DUREL).

Data collection tool and technique

For potentially traumatic events, a list of those events was included based on Tedeschi and Calhoun[12] and asked from participants that "have you experienced any of the following traumatic events in the last 5 years?" with response options "yes" and "no." These potentially traumatic events including "loss of a loved one and close relatives," "severe differences between parents or their separation," "severe job stress in the family, such as unemployment," "severe traffic accident leading to hospitalization," "severe negative academic events such as rejection in an important exam," and "having yourself or your first-degree relatives with a dangerous disease such as cancer."

The Persian brief version of PTGI validated by Amiri *et al*.[23] was used for measuring PTG. This inventory is included 10 self-report questions on 5 subscales (relating to others, new possibilities, personal strength, spiritual change, and appreciation of life). Each subscale has two items. A six-point Likert use for scoring subscales (1: "I did not experience this change as a result of my crisis." 2: "I experienced this change to a very small degree as a result of my crisis." 3: "I experienced this change to a small degree as a result of my crisis." 4: "I experienced this change to a moderate degree as a result of my crisis."

5: "I experienced this change to a great degree as a result of my crisis." 6: "I experienced this change to a very great degree as a result of my crisis"). The Cronbach's alpha of the total scale was 0.88 in this study (relating to others = 0.61, new possibilities = 0.73, personal strength = 0.72, spiritual change = 0.77, and appreciation of life = 0.63).

The Persian version of DUREL validated by Saffari *et al*. was used to measure religiosity.[24] This questionnaire consists of three subscales including organizational religiosity (1 item: how often do you attend church or other religious meetings?), nonorganizational religiosity (1 item: how often do you spend time in private religious activities, such as prayer, meditation, or Bible study?), and intrinsic religiosity (three items, for example: in my life, I experience the presence of the Divine).[25] A six-point Likert use for scoring organizational religiosity and nonorganizational religiosity while the three questions for intrinsic religiosities use a five-point Likert scale.[22] Saffari *et al*. have recruited 796 college students with an average age of 23.7 from Tehran. The Cronbach's alpha ranged from 0.866 to 0.921 in this study.[24]

The analysis of data was conducted in two steps. First, we run a latent class analysis (LCA) to identify subgroups of traumatic event patterns. Second, PTG and religiosity domains across the identified classes of traumatic events were compared by ANOVA and Bonferroni *post hoc* tests. LCA was categorized individuals within homogeneous subgroups according to their experiencing of traumatic events. To identify the best-fitting model that described the data and optimally was explained the heterogeneity, several LCA models with increasing numbers of classes were examined. The analysis started with a two-class model, and successive models were gradually increased until the model was no longer interpretable. The optimal number of classes was determined by considering statistical criteria and classes' interpretability. The statistical criteria were used the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC),[26] Sample Size Adjusted Bayesian Information Criterion (aBIC),[27] and Bootstrap Likelihood Ratio Test (BLRT). Low BIC, AIC, and aBIC values show a better model fit. Nylund *et al*.,[28] in a simulation study, showed that aBIC is a superior index compared to BIC and AIC. A significant BLRT *P* value indicates that the latent class model with k classes was better than the simpler k – 1 class model.[29] Furthermore, the entropy value (0–1) was considered to assess the quality of the classification of individuals into classes, and values closer to 1 showed more desirable classification.[30] LCA was performed using Mplus 7.4,[31] and missing data were treated using the full information maximum likelihood, and ANOVA tests were performed using STATA 14 (StataCorp LLC, College Station, TX, USA).

Ethical consideration

The Ethics Committee of Kerman University of Medical Sciences approved the protocol of the study (approval no.IR.KMU.REC.1400.156).

Results

The information of relative frequency for exposure to each potentially traumatic event and descriptive statistics (mean and standard deviation) of PTG and religiosity domains is presented in Table 1.

The "loss of a loved one and close relatives" was as the most common traumatic event (39.4%), and the "severe differences between parents or their separation" was as the lowest traumatic event (5.4%). With regard to research aim, to extract patterns of traumatic events, the LCA solutions ranging from two to six classes were estimated. The fit statistics are displayed in Table 2.

Fit statistics suggested that the three-class solution provided the best fit to the data, because showed a significant Lo–Mendell–Rubin Likelihood Ratio Test and the BLRT, and also the lowest value of BIC and aBIC. Classes were labeled based on the pattern of conditional response probabilities on each of the traumatic events [Figure 1]. Latent Class 1 was called multiple-traumatic events with a prevalence of 2.9% ($n = 27$) and was characterized by a high probability

Table 1: Exposure to potentially traumatic events and descriptive statistics of posttraumatic growth and religiosity domains

Potentially traumatic events	*n* (%)
Loss of a loved one and close relatives	370 (39.4)
Severe differences between parents or their separation	54 (5.8)
Severe job stress in the family, such as unemployment	172 (18.4)
Severe traffic accident leading to hospitalization	116 (12.4)
Severe negative academic events such as rejection in an important exam	132 (14.1)
Having yourself or your first-degree relatives with a dangerous disease such as cancer	194 (20.7)
Potentially traumatic events	**Mean±SD**
PTG	
Relating to others	7.1±2.1
New possibilities	7.8±2.1
Personal strength	7.7±1.9
Spiritual change	7.6±2.1
Appreciation of life	7.8±1.9
PTG total	38.2±7.7
Religiosity	
Organizational and nonorganizational religiosity	7.1±2.6
Intrinsic religiosity	12.5±2.6
Total religiosity	19.6±4.5

SD=Standard deviation, PTG=Posttraumatic growth

Table 2: Fit statistics of the latent class analysis

N class	AIC	BIC	aBIC	BLRT	LMR-LRT	Entropy
2 class	4594.8	4657.8	4616.6	414.1***	405.7***	0.723
3 class	**4544.8**	**4641.8**	**4578.3**	**63.9*** **	**62.6*** **	**0.707**
4 class	4537.5	4668.4	4582.7	12.2	20.9	0.778
5 class	4540.1	4705.02	4597.04	11.39	11.16	0.718
6 class	4549.2	4748.09	4617.8	4.88	4.782	0.762

***P<0.001. The bolded solution was determined to be the final model. BIC=Bayesian Information Criterion, aBIC=Sample Size Adjusted Bayesian Information Criterion, AIC=Akaike Information Criterion, BLRT=Bootstrap Likelihood Ratio Test, LMR-LRT=Lo-Mendell-Rubin Likelihood Ratio Test

of all traumatic events among students clustered in this class (item-response probabilities >0.7). Latent Class 2 was labeled intermediate-traumatic events with a prevalence of 31.1% (n = 294) and was characterized by a high probability (>0.6) of one traumatic event (loss of a loved one and close relatives) for students clustered in this class. Moreover, latent class 3 was labeled low-traumatic events with the prevalence of 66.0% (n = 623), and was characterized by a low probability (<0.03) of any traumatic event exception to events "having a dangerous disease" and "losing close relatives" with probability 0.09 and 0.25, respectively, for students clustered in this class.

The PTG and religiosity and their domains were compared across traumatic events-classes and are shown in Table 3. All five PTG domains scores significantly vary across the three latent traumatic events-classes. The first class had the lowest PTG scores across all five domains, as well as the lowest total PTG score. The second class had moderate PTG scores across all five domains, as well as the moderate total PTG score. The third class had the highest PTG scores across the five domains and the highest total PTG scores.

The two religiosity domain scores significantly vary across the three latent traumatic events-classes. The third class had the highest religiosity scores across the two domains and the highest total religiosity scores.

Discussion

The results showed that the college students clustered into three groups based on traumatic events, including multiple-traumatic events, intermediate-traumatic events, and low-traumatic events. Shevlin and Elklit in their research showed that four classes for traumatic events that individuals experiences of life including "low risk," "intermediate risk," "pregnancy," and "high risk".[32] Another study determined three classes of childhood trauma exposure, including "primarily female," "primarily male," and "low levels of childhood traumatic experiences."[33] Due to the placement of the experience traumatic events in homogeneous groups, health plans, etc., can be made due to differences between

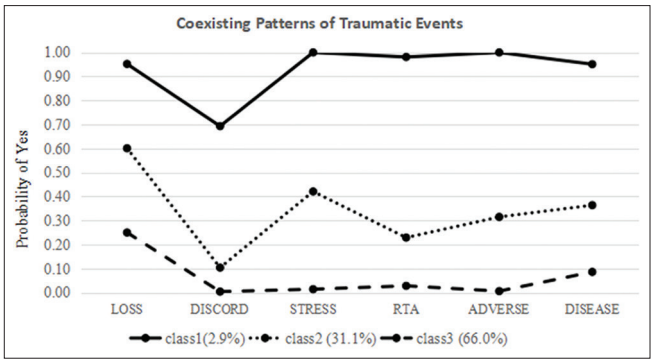

Figure 1: Estimated traumatic events prevalence for the three-class solution. Estimated traumatic event prevalence for the three-class solution. Note LOSS = Loss of a loved One and close relatives, DISCORD = Severe differences between parents or their separation, STRESS = Severe job stress in the family, such as unemployment, RTA = Severe traffic accident leading to hospitalization, ADVERSE = Severe negative academic events such as rejection in an important exam, DISEASE = Having yourself or your first-degree relatives with a dangerous disease

the groups, which increases the effectiveness of the programs.[34,35]

Furthermore, results of this study showed that PTG was at the lowest level in the multiple-traumatic event group, moderate in the intermediate-traumatic event group, and the highest level in the low-traumatic event group. In the other hand, the lower the severity of the traumatic events experienced, the higher the PTG score.

Previous studies are also consistent with these results. Researchers have recently proposed a curvilinear relationship, in which it is stated that anxiety is necessary to begin the PTG process; however, high levels of anxiety prevent the growth process. In other words, higher levels of PTG are associated with lower levels of anxiety.[36-39] Moreover, researchers have argued that threats usually lead to positive changes, growth, and a new sense of meaning in life when they are related to impending death and awareness of mortality.[15] In this study, high levels of PTG were also associated with loss events.

PTG is characterized by the interaction of personal and environmental resources after adverse events.[40] Approximately, 50%–60% of people have reported positive changes spontaneously after traumatic events.[15,41] According to personal resources, this suggests that PTG may be a natural process that does not require intervention and humans have an innate tendency to move toward growth, but environmental resources should provide facilitating conditions such as supportive relationships and empathy that can arise from religiosity.[42] Results showed that along with the increase in PTG in the three groups, traumatic events of dimensions of religion also increased. Previous studies have also reported that different dimensions of religious activities are positively correlated with PTG.[43,44]

Table 3: Mean scores and standard deviations and ANOVA results for posttraumatic growth and Duke University Religion Index domains across classes in Iranian college students

	Mean±SD			*F* (df=2) statistic	Group difference
	Class 1 (2.9%)	Class 2 (31.1%)	Class 3 (66.0%)		
PTG domains					
Relating to others	6.0±2.5	7.0±2.1	7.1±2.0	3.36*	3>1
New possibilities	6.9±1.9	7.4±2.1	8.1±1.9	13.00***	3>2; 3>1
Personal strength	6.6±2.1	7.5±1.9	7.8±1.9	5.76**	3>1
Spiritual change	6.5±2.2	7.4±2.0	7.8±2.0	7.17***	3>2; 3>1
Appreciation of life	6.6±2.2	7.8±1.8	7.8±1.9	5.04**	3; 2>1
PTG total	34±9	37.4±7.5	38.6±7.7	5.57**	3>1
DUREL domains					
Organizational and nonorganizational religiosity	6.8±2.1	6.7±2.6	7.2±2.7	4.91**	3>2
Intrinsic religiosity	10.6±2.9	12.5±2.7	12.6±2.5	7.53***	3>2; 3>1
Total religiosity	17.5±4.3	19.2±4.5	19.9±4.5	5.40**	3>1

**P*-value <0.01, ***P*-value <0.001. PTG=Posttraumatic growth, DUREL=Duke University Religion Index

The current study had several limitations. First, the potentially traumatic events were not comprehensive. Second, the sample size of this study is almost low, because latent class modeling needs higher sample size. Third, the participants of this study were college students and generalizability for total population is unclear. One of the limitations of this study was that finally, the other environmental variables were not considered, including family or friend support that can be very influential among adolescents. Measuring the relationship between other environmental variables and the groups of traumatic events as well as measuring the severity of psychological consequences, for example, PTSD at different groups of events, could enrich the present study.

Conclusion

Although the current study showed that the relative frequency of multiple traumatic events in Iranian students is low, individuals categorized in this class had the lowest PTG, and these findings reveal the necessitation of planning and interventions for PTG. Therefore, therapists can make their treatment plans based on strengthening different aspects of religion and growth considering the different levels of traumatic events in the youth and adolescents and being aware of PTG levels and religion.

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Conflicts of interest

There are no conflicts of interest.

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