Posttraumatic growth indicators in Brazilian and Pakistani samples

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ABSTRACT

We investigated indicators of posttraumatic growth (PTG) in victims of disasters. Six hypotheses were tested: the symptoms of re-experiencing and avoidance, typical of posttraumatic stress disorder (PTSD), would be positive predictors of PTG (h1); the Pakistanis would have lower PTG rates when compared to Brazilians (h2); higher number of traumatic events (h3), bombings and terrorism (h4) and pathological personality traits (h5) would be negative predictors of PTG; and the religiosity factor would be a positive indicator of PTG (h6). Participants included 202 subjects, 64.9% male with age ranges between 18 and 66 years (M = 28.07; SD = 8.82). Instruments used included the Posttraumatic Growth Inventory, the PTSD Checklist for DSM-5 and the Clinical Dimensional Personality Inventory-Screening. All hypotheses were partially corroborated. We discuss the implications of the transposition of Western evaluation methods and the posttraumatic perspective to Non-Western contexts.

Keywords: Psychological evaluation; Posttraumatic growth; Posttraumatic stress disorder; Personality; Natural and man-made disasters.

Indicadores de crescimento pós-traumático em amostra brasileira e paquistanesa

RESUMO

Investigou-se indicadores de crescimento pós-traumático (CPT) em vítimas de desastres por meio de seis hipóteses: os sintomas de reexperimentação e evitação, típicos do transtorno de estresse pós-traumático (TEPT), seriam preditores positivos de CPT (h1); os paquistaneses teriam menores taxas de CPT quando comparados a brasileiros (h2), maior número de eventos traumáticos (h3), bombardeios e terrorismo (h4) e traços patológicos de personalidade (h5) seriam preditores negativos de

CPT e o fator religiosidade seria um indicador positivo do CPT (h6). Participaram do estudo 202 indivíduos, 64,9% homens com idades entre 18 e 66 anos (M = 28,07; DP = 8,82). Os instrumentos utilizados incluíram o Inventário de Crescimento Pós-Traumático, o PTSD Checklist for DSM-5 e o Inventário Dimensional Clínico da Personalidade-Versão Triagem. As hipóteses foram parcialmente corroboradas. Se discute a transposição de métodos de avaliação ocidentais e perspectiva pós-traumática para contextos orientais.

Palavras-chave: Avaliação psicológica; Crescimento pós-traumático; Transtorno de estresse pós-traumático; Personalidade; Desastres naturais e provocados pelo homem.

Indicadores de crecimiento postraumático en una muestra brasileña y pakistaní

RESUMEN

Se han investigado indicadores de crecimiento postraumático (CPT) en víctimas de desastres a través de seis hipótesis: los síntomas de re experimentación y evitación, típicos del trastorno de estrés postraumático (TEPT), serían predictores positivos de CPT (h1); los paquistaníes tendrían menores tasas de CPT cuando comparados a brasileños (h2), mayor número de eventos traumáticos (h3), bombardeos y terrorismo (h4) y rasgos patológicos de personalidad (h5) serían predictores negativos de CPT y el factor religiosidad sería un indicador positivo del CPT (h6). Participaron 202 individuos, 64,9% hombres con edades entre 18 y 66 años (M = 28,07, DP = 8,82). Los instrumentos utilizados incluyeron el Inventario de Crecimiento Post-traumático, la lista de verificación del PTSD para el Checklist for DSM-5 y el Inventario Dimensional Clínico de la Personalidad – Versión EvaluaciónTriage. Las hipótesis fueron parcialmente corroboradas. Se discute la transposición de métodos de evaluación occidentales y perspectiva post-traumática para contextos orientales.

Palabras clave: Evaluación psicológica; Crecimiento postraumático; Trastorno por estrés postraumático; Personalidad; Desastres naturales y provocados por el hombre.

Introdução

The psychological consequences of post-trauma, in which fundamental assumptions of individuals and adaptive resources are challenged, can be a fertile ground for the emergence of posttraumatic growth (PTG). The term refers to a positive psychological change experienced as a result of the struggle with highly challenging life circumstances (Calhoun & Tedeschi, 2001). It occurs in a wide range of people, facing a great variety of traumatic circumstances and it can be understood by five domains, namely, greater appreciation of life or changes in the sense of priorities; greater sense of personal strength; greater intimacy in interpersonal relationships; recognition of new possibilities or paths in life; and spiritual development (Tedeschi & Calhoun, 1996).

PTG develops concomitantly with the attempt to adapt to negative consequences, so that it tends to coexist with the residual suffering of the trauma (Tedeschi & Calhoun, 2004). Studies have shown that higher PTG rates are related to the presence of post-

traumatic stress symptoms (Park, Cohen & Murch, 1996; Tomich & Helgeson, 2004; Wild & Paivio, 2003).

The results of a meta-analysis including 77 cross-sectional studies (Helgeson, Reynolds & Tomich, 2006) indicated that PTG is associated with greater trauma-related avoidance and intrusive thoughts, typical symptoms of posttraumatic stress disorder (PTSD). In this sense, studies indicate that the process of intrusive rumination, which generates distress, and starts soon after the traumatic event, is related to the development of PTG (Taku, Calhoun, Cann, & Tedeshi, 2008; Tedeshi & Calhoun, 2004). Although self-punishing rumination has an adverse effect on overall psychological functioning (Nolen-Hoeksema, McBride & Larson, 1997), self-punishing rumination related to the traumatic event does not seem to be exclusively negative and may be predictive of PTG (Calhoun, Cann, Tedeschi & McMillan, 2000) insofar as it can include meaning, problem solving, reminiscences and anticipation (Martin & Tesser, 1996). Thus, the more the individual actively thinks about the circumstances of the event in a way that makes sense to him, the more likely that the PTG will manifest (Calhoun & Tedeschi, 1998; O'Leary, Alday, & Ickovics, 1998).

In contrast, some studies indicate that the higher the PTG level, the lower the symptoms of posttraumatic stress (Ai, Cascio, Santangelo, & Evans-Campbell, 2005; Frazier, Conlon & Glaser, 2001; Hall et al., 2008). Other studies suggest that PTG and psychological distress are not related (Cordova et al., 2007; Val & Linley, 2006; Widows, Jacobsen, Booth-Jones & Fields, 2005). However, there is growing empirical evidence of nonlinear relations between trauma, PTSD and PTG, which suggests that PTG tends to occur more frequently in the face of moderate stressors and distress, and with a lower incidence in mild or extreme stressors and distress (Kira et al., 2013, Levine, Laufer, Hamama-Raz, Stein, & Solomon, 2008; Shakespeare-Finch & Lurie-Beck, 2014).

PTG appears to be more likely in certain types of trauma that produce moderate stress than in those that produce severe stress conditions. Shakespeare-Finch and Armstrong (2010) found lower levels of PTG in victims of sexual abuse compared to those who faced death of close people, which is considered secondary trauma. In line with this findings, the study by Kira et al. (2013), using a comprehensive system based on trauma taxonomy, found that traumas characterized by a single event such as car accidents and secondary trauma, such as witnessing a traumatic event (type I), were more likely to be associated with PTG. The most intense types of trauma, such as repeated sequence of events that happened and ceased, such as sexual abuse and incest (type II) and continuous and chronic traumatic stressors, such as discrimination and oppression (type III), were not significantly associated with PTG, while severe type III traumas were negatively associated with PTG. Other studies corroborate these findings (Kılıç, Magruder, & Koryürek, 2016; Levine et al., 2008; Shakespeare-Finch & Lurie-Beck, 2014).

In this context, the study developed by Karam et al. (2014) analyzed 20 national surveys conducted by the World Health Organization, which examined 51,295 subjects with ages over 18 years. The authors identified a higher incidence of PTSD, anxiety and depression in people who experienced a number equal to or greater than four traumatic events when compared to those who experienced fewer events. Based on this, the authors suggest an empirical criterion of four trauma episodes so that behavioral parameters begin to change critically and in a detrimental way, which could indicate a threshold for mental health risk due to cumulative trauma effects.

Also regarding the factors related to the manifestation of PTG, the personality traits stand out among the internal factors, as they may affect the probability of people making a positive use of the consequences of traumatic events. Among these are extraversion, openness, agreeableness and conscientiousness (Shakespeare-Finch,

Gow, & Smith, 2005; Tedeschi & Calhoun, 1996). Relations between optimism and PTG are also observed, which may be associated with the influence that optimism exerts on cognitive processing due to a greater ability to focus attention and resources on problem solving after trauma (Tedeschi & Calhoun, 1996). In addition, a study by Shuwiekh, Kira and Ashby (2018) found that dynamics of aspiration by patterns and order were positively associated with PTG while a self-discrepancy functioning was predictive of low PTG indices.

Furthermore, religiosity has also been studied as an important indicator of PTG. In many cultures, suffering is seen as having a transformative power, and is regarded by some Islamic traditions as a positive instrumental for Allah's purposes (Shaw, Joseph & Linley, 2005). In this sense, scientific findings suggest that religious participation and openness may be a promoter of PTG (Calhoun et al., 2000; Tedeschi & Calhoun, 1996; Shaw et al., 2005). However, individuals who are not religious or who are atheists may also experience PTG, as there may be a greater involvement with fundamental existential issues and this involvement in itself can be experienced as growth (Tedeschi & Calhoun, 2004).

Although some investigative progress has been made, little is known about the concomitant processes of the experience of PTG. Investigations in this area can provide information on psychological phenomena and indicators favoring the understanding of those who provide assistance, as well as promote assistance to those dealing with major life crises. Thus, the present research aims at investigating positive and negative indicators in the promotion of PTG in victims of natural and/or man-made disasters (The Johns Hopkins, The International Federation of Red Cross, & Red Crescent Societies, 2017).

Six hypotheses were developed for this study: (h1) the symptoms of PTSD, mainly associated with rumination processes (DSM-5 criterion B) and avoidance (DSM-5 criterion C) are a positive indicator in the promotion of PTG (Calhoun et al. 2000; Helgeson et al., 2006; Park et al., 1996; Taku et al., 2008; Tedeshi & Calhoun, 2004; Tomich & Helgeson, 2004; Wild & Paivio, 2003); (h2) individuals who are constantly in an environment permeated by natural/environmental disasters such as earthquakes and floods of great magnitudes added to armed conflicts, bombings, and terrorist attacks (here represented by the sample of Pakistan) should present a lower rate of posttraumatic growth and higher symptomatology of PTSD when compared to individuals who are not submitted to this contingency of threats (here represented by a Brazilian sample) (Ai et al., 2005; Frazier et al., 2001; Kılıç et al., Shakespeare-Finch and Armstrong, 2010, Shakespeare-Finch & Lurie-Beck, 2014), (h3) individuals who experienced four or more traumatic events tend to present a lower PTG index (Karam et al., 2014); (h4) events related to bombings and terrorism are less associated with the promotion of PTG when compared to other disaster events (Kılıç et al., 2013, Levine et al., 2008; Shakespeare-Finch and Armstrong, 2010; Shakespeare-Finch & Lurie-Beck, 2014); (h5) pathological personality functioning is a negative indicator of PTG promotion (Shakespeare-Finch et al., 2005; Shuwiekh et al., 2018; Tedeschi & Calhoun, 1996); and (h6) the religiosity factor is a positive indicator of PTG (Calhoun et al., 2000; Tedeschi & Calhoun, 1996; Shaw et al., 2005).

Method

Participants
A total of 202 subjects (100 Pakistanis and 102 Brazilians) who experienced natural or man-made disasters (TJH, IFRC & RCS, 2017) participated in the study. Disasters are listed in Table 2. Sociodemographic data can be observed in Table 1, according to nationality.

Table 1. Sociodemographic data of participants according to nationality

Sociodemographic variables	Brazil (N = 102)	Pakistan (N = 100)
Ages	**M (SD)**	**M (SD)**
	27.39 (8.55)	28.77 (9.07)
Sex	*N (%)*	*N (%)*
Male	36 (35.3%)	95 (95.0%)
Female	66 (64.7%)	5 (5.0%)
	N (%)	*N (%)*
Ethnicity	White 77 (75.5%) Brown 24 (23.5%) Black 1 (1.0%)	Pashtun 77 (77%) Punjabi 19 (19%) Sindhi 2 (2.0%) Baloch 2 (2.0%)
Civil Status	*N (%)*	*N (%)*
Married	18 (17.6%)	38 (38.0%)
Single	78 (76.5%)	62 (62.0%)
Divorced	4 (3.9%)	0 (0%)
Other	2 (2.0%)	0 (0%)
Religion	*N (%)*	*N (%)*
Islam	0 (0%)	100 (100%)
Catholicism	26 (25.5%)	0 (0%)
Evangelicalism	7 (6.9%)	0 (0%)
Spiritism	4 (3.9%)	0 (0%)
Umbanda	2 (2.0%)	0 (0%)
Christianity	1 (1.0%)	0 (0%)
Eubiota	1 (1.0%)	0 (0%)
Mormon	1 (1.0%)	0 (0%)
Protestantism	1 (1.0%)	0 (0%)
Jehovah's Witness	1 (1.0%)	0 (0%)
Atheists or not adept of any religion	58 (28.8%)	0 (0%)
Education level	*N (%)*	*N (%)*
Graduate	27 (26.5%)	6 (6.0%)
Higher Education	67 (65.7%)	51 (51.0%)
High School	8 (7.8%)	34 (34.0%)
Elementary School	0 (0%)	8 (8.0%)
Illiterate	0 (0%)	1 (1.0%)
Psychotherapy treatment	50 (49.0%)	0 (0%)
Psychiatric Treatment	6 (5.9%)	4 (4.0%)
Psychotropic Medication	2 (2.0%)	11 (11.0%)
Psychiatric Diagnosis	4 (4.0%)	0 (0%)
Suicidal ideation	2 (2.0%)	2 (2.0%)
Loss of significant person in the past year	18 (17.6%)	10 (10%)
Divorce in the past year	1 (1.0%)	0 (0%)

For the whole sample, the age ranged from 18 to 66 years (M = 28.07; SD = 8.82), and 131 were male (64.9%). Regarding ethnicity, 77 (38.1%) were white and 77 (38.1%) were Pashtun. Regarding marital status, 140 (69.3%) were unmarried and 56 (27.7%) were married. Of the total number of participants, 100 (49.5%) reported being adherent to Islam and 58 (28.8%) reported being atheists or not adherent to any religion. Regarding education level, most participants (N = 118, 58.4%) attended or were enrolled in higher education and only one participant was illiterate.

Of the total number of participants, 50 (24.8%) reported having undergone or being under psychotherapeutic care for an average period of 2 years and 4 months, 10 (5.0%) reported having undergone or being under psychiatric care for an average period of 8 months, 13 (6.4%) participants reported having used or making use of psychotropic medication, one participant reported suicidal ideation at the time of the survey and other three reported suicidal ideation in the past. In addition, four presented a psychiatric diagnosis, including depression (N = 2), panic disorder (N = 1) and bipolar disorder (N = 1). It should be noted that none of the participants experienced traumatic events as professionals in the area, all were considered first-degree victims (direct victims) of the events, and all were housed at the time of the research.

Instruments

For the present research we used the Posttraumatic Growth Inventory (PTGI; Tedeshi & Calhoun, 1996), the PTSD Checklist for DSM-5 (PCL-5; Blevins, Weathers, Davis, Witte, & Domino, 2015) and the IDCP-Screening version (IDCP-Triagem (IDCP-Screening); Carvalho, Pianowski, & Reis, 2017).

PTGI evaluates positive changes in life perceived after stressful experiences. It is a self-report scale of 21 items with Likert scores ranging from 0 "I did not experience this change as a result of my experience" to 5 "I experienced this change to a very significant degree." The instrument includes five factors for measuring "Relation to others," "New possibilities," "Personal strength," "Spiritual change," and "Appreciation for life." Regarding the psychometric properties, referring to the internal consistency, the instrument presented alpha of 0.90 in the total factor ranging from 0.70 to 0.83 in the factors and test-retest reliability of 0.71 (Tedeshi & Calhoun, 1996).

PCL-5 is a self-report measure of 20 items that aims to assess PTSD symptoms according to the DSM-5 diagnostic criteria. It has a five-point Likert scale ranging from 1 "Not at all" to 5 "Extremely". Studies point to evidence of satisfactory psychometric properties for the instrument (Blevins et al., 2015).

The Dimensional Clinical Personality Inventory (IDCP) – screening version was developed from the full version of IDCP (Carvalho & Primi, 2015), whose psychometric properties demonstrated adequacy in the previous studies (e.g. Carvalho, Primi & Stone, 2014). The currently used version of IDCP is aimed at screening people with suspected personality disorders. The instrument consists of 15 items that were selected based on analyses identifying the most discriminating items for people with and without personality disorders. The items are arranged in a 4-point Likert scale, with 1 being the "has nothing to do with me" and 4 "everything to do with me". The psychometric properties suggest suitability of the instrument for screening purposes (Carvalho, 2017). In addition, a cut-off point of 10 was adopted, based on the literature (Carvalho, Pianowski, & Reis, 2017).

For the present research, the instruments underwent a translation process as well as a transcultural adaptation. For the Pakistanis, a translation of the IDCP-Screening into English and the cross-cultural adaptation of all the instruments (PTGI, PCL-5 and IDCP-Screening) were carried out with the help of community agents and the local population. For Brazilians, the Portuguese translation of the PTGI and PCL-5 was added, in addition to the cross-cultural adaptation. A pilot study was conducted in a sample of 20 subjects (10 Pakistanis and 10 Brazilians) to test the level of comprehension of the items and instructions of the instruments obtaining satisfactory feedback. The internal consistency coefficient (Cronbach's alpha) was calculated for all tests with satisfactory values ranging from 0.89 to 0.92 (Nunnally, 1978).

Procedures

Initially the project was submitted and approved by the Research Ethics Committee (CAAE: 37490114.2.0000.5514). Data collection was performed by two emergency professionals (a Brazilian psychologist and a Pakistani sociologist) experienced in disaster situations. In Brazil, data collection was carried out collectively, in classrooms of a university; in Pakistan, data collection was individual through visits to homes in communities affected by disasters, selecting those who were of legal age and who agreed to participate in the research. At the time of application, the Free and Informed Consent Form was delivered and all doubts regarding the research objectives, privacy and the forms to be filled were clarified. The administration lasted about 30 minutes per person both individually and collectively.

Data analysis

First, descriptive analyses were conducted to characterize the sample according to the variables of interest. Multiple regression analyses (enter method) were performed using the clusters of re-experiencing and avoidance from the PCL-5 as predictors of the general factor, Relation with others, Appreciation for life, New possibilities, Spiritual change, and Personal strength of the PTGI. The enter method was used, since this allowed to test the hypothesized model, i.e., always including the cluster variables of re-experiencing and avoidance from PCL-5. In addition, *t*-test analyses were performed to compare the groups' mean scores in the PTGI according to the variables: indicators of PDs, number of events, bombings and terrorism, country of origin and religion. Pearson correlations were also performed between the total PTGI score and its factors with the variables, PTSD symptoms, TP indicators, number of events and religion. For all the analyses performed, $p \leq 0.01$ was considered, since the traditional level of significance (i.e., $p \leq 0.05$) tends to favor the occurrence of false positives (i.e., it suggests that effects are significant when in fact they are not) and the level of significance recently proposed (i.e., $p \leq 0.005$) should be adopted in cases of unsupported verifications in the literature (Benjamin et al., 2017).

Results

Table 2 shows the frequency of victims and the mean number of disasters experienced by the participants according to the country of origin.

Table 2. Frequency of victims according to disaster modality and mean of events experienced

Natural/Environmental	Brazil (N = 102)		Pakistan (N = 100)	
	N (%)	*M (SD)*	*N (%)*	*M (SD)*
Inundation	102 (100%)	1.27 (0.56)	34 (34%)	4.44 (0.82)
Earthquake	0 (0)	0 (0)	100 (100%)	5.98 (1.53)
Storm	35 (34.3%)	3.43 (3.05)	18 (18%)	4.11 (1.27)
Drought	13 (12.7%)	1.46 (1.39)	0 (0%)	0 (0)
Fog	2 (1.9%)	1.00 (0)	0 (0%)	0 (0)
Tornado	2 (1.9%)	1.00 (0)	0 (0%)	0 (0)
Cyclone	1 (0.9%)	1.00 (0)	0 (0)	0 (0)
Hurricane	1 (0.9%)	1.00 (0)	0 (0)	0 (0)
Man-made	*N (%)*	*M (SD)*	*N (%)*	*M (SD)*
Earth Sliding	5 (4.9%)	1.40 (0.89)	69 (69%)	2.32 (0.91)
Bombing	0 (0%)	0 (0%)	40 (40%)	8.53 (1.56)
Terrorist attack	0 (0%)	0 (0%)	47 (47%)	8.51 (1.28)
Car accident	28 (27.4%)	1.32 (0.77)	14 (14%)	1.36 (0.49)
Urban Fire	3 (2.9%)	1.00 (0)	19 (19%)	1.84 (0.76)
Rural Fire	6 (5.8%)	4.50 (4.32)	4 (4%)	1.50 (0.57)
Epidemic	11 (10.7%)	2.09 (1.97)	0 (0%)	0 (0)
Electrical Accident	3 (2.9%)	1.67 (0.57)	0 (0%)	0 (0)
Chemical Accident	2 (1.9%)	1.00 (0)	0 (0%)	0 (0)
Industrial Accident	2 (1.9%)	1.00 (0)	0 (0%)	0 (0)
Forest Fire	1 (0.9%)	5.00 (0)	0 (0)	0 (0)

Among the most frequent occurrences, we observed floods (N = 136, 67.3%), experienced mostly by Brazilians, followed by earthquakes, lived exclusively by Pakistanis (N = 100, 49.5%). In the category of events caused by man, the most frequent event was landslide (N = 79; 73.9%). The events with the highest means were those of the man-made category, with the bombings being experienced about 8.5 times by 40 individuals and terrorist attacks with a mean of 8.5 times by 47 of the participants. In general, in relation to all events, the experiences ranged from one to 37 occurrences (M = 10.8; SD = 10.2). (M = 10.8; SD = 10.2).

In order to verify whether symptoms of PTSD, mainly associated with rumination processes (DSM-5 criterion B) and avoidance (DSM-5 criterion C), would be positive indicators in the promotion of PTG, multiple regressions were performed, as presented in Table 3.

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Table 3. Symptoms of re-experiencing and avoidance of PTSD as predictors of PTG

Total Score of PTGI ($r^2_{adjusted}$ = 0.12)				
Predictor Variables	*SE*	*Beta*	*t*	*p*
PCL Re-experiencing	0.025	0.250	3.176	< 0.00
PCL Avoidance	0.051	0.158	2.014	0.04
PTGI Relation with others ($r^2_{adjusted}$ = 0.09)				
Predictor Variables	*SE*	*Beta*	*t*	*p*
PCL Re-experiencing	0.029	0.216	2.715	< 0.00
PCL Avoidance	0.060	0.149	1.873	0.06
PTGI New Possibilities ($r^2_{adjusted}$ = 0.12)				
Predictor Variables	*SE*	*Beta*	*t*	*p*
PCL Re-experiencing	0.025	0.268	3.402	< 0.00
PCL Avoidance	0.053	0.129	1.633	0.10
PTGI Personal Strength ($r^2_{adjusted}$ = 0.12)				
Predictor Variables	*SE*	*Beta*	*t*	*P*
PCL Re-experiencing	0.029	0.223	2.830	< 0.00
PCL Avoidance	0.061	0.182	2.318	0.02
PTGI Appreciation for Life ($r^2_{adjusted}$ = 0.04)				
Predictor Variables	*SE*	*Beta*	*t*	*P*
PCL Re-experiencing	0.033	0.178	2.164	0.03
PCL Avoidance	0.069	0.058	0.706	0.48
PTGI Spiritual change ($r^2_{adjusted}$ = 0.04)				
Predictor Variables	*SE*	*Beta*	*t*	*P*
PCL Re-experiencing	0.035	0.130	1.583	0.11
PCL Avoidance	0.073	0.130	1.591	0.11

Significantly, only the re-experiencing variable showed significant predictive capacity ($p \leq 0.01$) for four of the six factors, according to the model tested. It was observed predictability of 12.0% for PTGI total score, factor New possibilities, and factor Personal strength; and 9% for factor Relation with others. Then, a *t*-test (Table 4) was performed for independent samples to verify if the sample most constantly permeated by disasters (i.e., the Pakistani sample) would have a lower posttraumatic growth index when compared to individuals who are not submitted to this contingency and magnitude of threats (i.e., sample of Brazilians).

Table 4.Comparison of means of the participants in the PTGI according to country of origin.

PTGI Factors	*Brazil M (SD)*	*Pakistan M (SD)*	*t (p)*	*d*
Relation with others	1.87 (1.51)	1.38 (0.43)	-3.13 (> 0.00)	1.01
New possibilities	1.42 (1.33)	1.20 (0,50)	-1.54 (0.12)	0.22
Personal strength	1.80 (1.50)	1.48 (0.65)	-1.99 (0.48)	0.28
Appreciation for life	2.00 (1.59)	1.36 (0.59)	-3.70 (< 0.00)	0.53
Spiritual change	1.31 (1.57)	1.67 (1.04)	1.88 (0.61)	0.27
Total PTGI	1.72 (1.34)	1.38 (0.25)	-2.45 (0.01)	0.35

Note.Brazil (N = 102); Pakistan (N = 100).

Statistically significant in the factors Relation with Others and Appreciation for Life factors, and with magnitudes of effect above 0.20 (Cohen, 1988) in all factors, Brazilians presented higher rates of posttraumatic growth in almost all factors of the PTGI, including the total score. However, in the Spiritual Change factor, with a small magnitude of effect, the Pakistanis presented the highest scores, although not statistically significant (t = 1.89; p = 0.60; d = 0.27).

The analysis of *t* test for independent samples was also performed to verify the presence of PTSD symptomatology between Pakistanis and Brazilians. In a significant way and with significant magnitudes of effect, the Pakistani showed a higher PTSD symptomatology in the total PCL-5 score (t = 5.11, p = 0.001; d = 0.72), in the cluster re-experiencing (t = 2.76; p = <0.00; d = 0.39), in negative cognitions (t = 6.07; p = <0.00; d = 0.86) and in hyperexcitation (t = 5.04; p = <0.00; d = 0.71) and without statistical significance, but with little magnitude of effect in the avoidance cluster (t = 1.00; p = 0.31; d = 0.15).

Comparisons were also made to verify if individuals who experienced four or more traumatic events tend to have a lower PTG index. The findings are shown in Table 5.

Table 5. Comparison of participants' means in the PTGI according to the number of events experienced

PTGI Factors	< 4 events M (SD)	>= 4 events M (SD)	t (p)	d
Relations with others	1.60 (1.48)	1.64 (0.91)	-0.248 (0.80)	0.04
New possibilities	1.24 (1.28)	1.35 (0.84)	-0.677 (0.49)	0.11
Personal strength	1.35 (0.84)	1.70 (0.99)	-0.953 (0.34)	0.37
Appreciation for life	1.74 (1.61)	1.66 (1.05)	0.456 (0.64)	0.06
Spiritual change	1.00 (1.40)	1.74 (1.25)	-3.82 (0.00)	0.57
Total PTGI	1.47 (1.32)	1.59 (0.75)	-0.876 (0.38)	0.12

Note. < 4 events (N = 70); >= 4 events (N = 132).

Contrary to expectations, participants who experienced a number equal to or greater than four traumatic events had, in general, higher PTG indices, which occurred with a moderate magnitude of effect on the Personal strength factor and significantly with a moderate magnitude of effect on the Spiritual change factor. Complementing these results, the means of events experienced by participants from each country were also verified by means of the *t* test by independent samples. The Pakistanis reported a mean of 18 (SD = 9.31) traumatic events throughout their lives, while Brazilians presented a mean of 4 (SD = 5.11) events throughout their lives (t = 13.29; p = <0.00; d = 1,87). In Table 6 it was verified that events related to bombings and terrorism are less associated to the promotion of PTG when compared to other disaster events.

Table 6. Comparison of participants' means in the PTGI according to experience or not of bombings and/or terrorism

PTGI Factors	Experienced M (SD)	Did not experience M (SD)	t (p)	d
Relations with others	1.37 (0.46)	1.74 (1.32)	2.13 (0.03)	0.33
New possibilities	1.21 (0.56)	1.35 (1.15)	0.92 (0.03)	0.14
Personal strength	1.44 (0.65)	1.73 (1.33)	1.65 (0.10)	0.25
Appreciation for life	1.33 (0.62)	1.84 (1.44)	2.66 (0.00)	0.41
Spiritual Change	1.63 (0.96)	1.42 (1.48)	-1.03 (0.30)	0.16
Total PTGI	1.32 (0.25)	1.63 (1.16)	1.77 (0.07)	0.32

Note. Experienced (N = 62); Did not experience (N = 140).

In general, participants who experienced bombings and terrorism events had lower PTG rates in most of the factors of the PTGI, including the total score. This finding occurred in a significant way and with a moderate magnitude of effect only in the Appreciation for life factor, but with significant magnitudes of effect on the factors Relation with others and Personal strength. We also investigated the differences between means in the PTGI of participants with personality disorders cut-off and those who did not reach the cutoff point (Table 7).

Table 7. Scores of participants with and without PDs in PTGI

PTGI Variables	Positive for PD M (SD)	Negative PD M (SD)	t(p)	d
Relation with others	1.54 (0,00)	1.72 (1.27)	1.15 (0.24)	0.20
New possibilities	1.33 (0.99)	1.29 (1.04)	-0.24 (0.81)	0.04
Personal Strength	1.64 (1.13)	1.65 (1.22)	0.55 (0.95)	0.01
Appreciation for life	1.64 (1.13)	1.89 (1.33)	2.18 (0.30)	0.20
Spiritual change	1.56 (1.25)	1.41 (1.44)	-0.78 (0.43)	0.11
Total PTGI	1.50 (0.91)	1.60 (1.05)	0.69 (0.48)	0.10

Group with indicators for PDs (N = 105); group without indicators for PDs (N = 97).

There were no differences in significant means, but significant effect variables for the factor Relation with others ($t = 1.15$; $p = 0.24$; $d = 0.20$) and Appreciation for life ($t = 2.18$; $p = 0.30$; $d = 0.20$) so that lower scores in these factors were verified in participants with indicators of PDs. In the comparisons between means in the PTGI presented in Table 8, participants were divided into two groups, those who reported having a religion and those who reported being atheists or not being adherent to any religion.

Table 8. Comparison of participants' means in the PTGI depending on whether or not they are religious

PTGI Factors	Religious M (SD)	Not adherent to any religion M (SD)	t (p)	d
Relation with others	1.57 (0.92)	1.78 (1.56)	0.95 (0.34)	0.18
New possibilities	1.33 (0.92)	1.26 (1.21)	-0.39 (0.69)	0.07
Personal strength	1.59 (1.00)	1.77 (1.50)	0.83 (0.40)	0.15
Appreciation for life	1.58 (1.11)	1.95 (1.58)	1.62 (0.10)	0.29
Spiritual Change	1.69 (1.29)	0.98 (1.37)	3.39 (< 0.00)*	0.54
Total PTGI	1.53 (0.82)	1.60 (1.30)	0.47 (0.63)	0.07

Note: Follows a religion (N = 144); Not adherent to any religion (N = 58). * = statistical significance.

Only a significant difference was observed with a significant magnitude of effect in the factor Spiritual change ($t = -3.39$; $p = <0.00$; $d = 54$), and the group with religion had higher mean scores. Contrary to expectations, in the Appreciation for life factor, the non-religion group had higher mean scores, although this result did not present statistical significance. Finally, correlation analyses between the PTGI and the other investigated variables were also performed, to complement the results already presented (Table 9).

Table 9. Correlations between factors and total PTGI score with variables analyzed in the study

Variables	PTGI Total	Relation with others	New possibilities	Personal strength	Appreciation for life	Spiritual change
PCL-5 Total	0.28*	0.24*	0.31*	0.25*	0.14	0.20*
Re-experiencingd	0.31*	0.28*	0.32*	0.30*	0.20*	0.18*
Avoidance	0.29*	0.26*	0.26*	0.29*	0.16	0.21*
IDCP-s	0.01	-0.01	0.04	-0.01	-0.06	0.07
Events	-0.03	-0.06	-0.00	-0.03	-0.12	-0.17
Religion	-0.02	-0.07	0.03	-0.06	-0,12	0.24*

* $p <= 0.01$.

As shown in Table 9, both the PCL-5 total score and the re-experiencing and avoidance clusters showed significant correlations with almost all factors and total PTGI scores, except for Appreciation for life. Regarding the measure of personality disorders, no significant correlations were found. There is also a low, but significant positive correlation between religiosity and the factor Spiritual change.

Discussion

The present study aimed to investigate positive and negative indicators for the promotion of PTG in the victims of natural and/or man-made disasters. Partially corroborating the first hypothesis (h1), no predictive capacity was observed for the cluster avoidance in relation to PTG. However, PTSD symptomatology related to re-experiencing or rumination processes was a significant predictor of growth, including a greater sense of personal strength, intimacy in interpersonal relationships, and recognition of new life paths despite adversity. Rumination related to the traumatic event seems to favor the development of PTG insofar as it promotes reflections, a sense of problem solving and anticipation of future stressors, which can generate a better confrontation in the face of adversities (Martin & Tesser, 1996, 192). Thus, active thinking about trauma circumstances enables the acquisition of understanding and meaning, increasing the likelihood that PTG will be experienced (Calhoun & Tedeschi, 1998; O'Leary et al., 1998).

Based on the findings of Kira et al. (2013), Levine et al. (2008), and Shakespeare-Finch and Lurie-Beck (2014), which suggest that PTG tends to occur more frequently in the face of moderate stressors and distress rather than in mild or extreme stressors and distress, we hypothesized that Pakistani participants would have a lower PTG index and a higher PTSD symptomatology compared to individuals who are not subject to these threats (h2). This hypothesis is based on the fact that Pakistani citizens are constantly experiencing a scenario of natural/environmental disasters, such as earthquakes and large-scale floods combined with armed conflict, bombings and terrorist attacks. The h2 was partially corroborated, as the Brazilians presented higher PTG indexes in almost all the factors of the PTGI, including the total score of the instrument, except in the factor Spiritual change, with the Pakistanis presenting higher scores. It is noteworthy that all Pakistani participants were adherent to Islam, and in this particular case, religious belief seems to promote a greater spiritual development that took on a protective role in the acquisition of PTG in these participants, although this is not evident in other growth factors. In many cultures, suffering is seen as having a transformative power, and is regarded by some Islamic traditions as a positive instrumental for Allah's purposes (Shaw et al., 2005).

In contrast, Pakistanis also had higher rates of PTSD symptomatology, including symptoms of negative cognition, hyperexcitation, re-experiencing and avoidance.

These data suggest that hostile environments with high rates of continuous and large-magnitude adversities tend to promote greater psychological illness and to be less facilitators for the development of coping strategies such as PTG (Kira et al., 2013; Shakespeare-Finch & Lurie-Beck, 2014).

The third hypothesis (h3) was based on empirical findings suggesting that individuals who experienced four or more traumatic events tended to have a lower PTG index (Karam et al., 2014). Contrary to expectations, participants who experienced a number equal to or greater than four traumatic events had higher PTG indexes in the Personal Strength and Spiritual Change factors. These results may be an effect of a greater psychological adaptability of coping due to previously known adversities. Despite this, it should be pointed out that, through the *t*-test for independent samples, the mean number of traumatic events experienced during the participants' life was 18 for the Pakistani and 4 for the Brazilians, suggesting that a greater number of traumatic events experienced negatively influences the development of the PTG, since in general (except in the spiritual change factor) the Pakistanis presented a lower PTG index when compared to the Brazilians.

With respect to h4, in which events related to bombings and terrorism were expected to be less associated with PTG when compared to other disaster events (Kılıç et al., 2013, Levine et al. Shakespeare-Finch and Armstrong, 2010; Shakespeare-Finch & Lurie-Beck, 2014), this was also partially corroborated. Participants experiencing bombings and terrorism events had lower PTG rates in almost all growth factors, including the general factor, but not in the New Possibilities and Spiritual Change factors. The observed profile indicated less Appreciation for life, greater feeling of fragility and less establishment of interpersonal support networks. In this sense, prolonged conflicts or organized violence tend to interfere with the construction of individual identity and psychological development. In these situations, individuals face experiences that may include loss or separation of family, friends or neighbors, destruction of their homes, stress and humiliation due to the militarization of daily life, which tends to weaken the sense of security, solidarity, and reduce cohesion in social relations (Giacaman et al., 2007).

We also tested the h5 hypothesis by which pathological personality functions were expected to be related to a lower likelihood of people making positive use of the consequences of traumatic events (Shakespeare-Finch et al., 2005; Tedeschi & Calhoun, 1996). Specifically, it was tested the hypothesis that pathological personality functioning would be a negative indicator of PTG, which was partially corroborated, since the group without indicators of PDs showed higher growth indexes in the factors Relation with other and Appreciation for Life; however this was not observed in the other growth factors evaluated.

Finally, according to h6 of the study, the religiosity factor would be a positive indicator of PTG. In general, differences in growth were only observed in the factor Spiritual change, with the religious group presenting higher indices, and in the factor Appreciation of Life, with the non-religion group presenting higher growth averages. The Spiritual change factor also showed significant correlations with the religion variable. In this sense, scientific findings suggest that religious participation and openness may be promoters of PTG (Calhoun et al., 2000, Tedeschi & Calhoun, 1996; Shaw et al., 2005). However, individuals who are not religious or who are atheists may also experience PTG, as there may be a greater involvement with fundamental existential issues, and this involvement in itself can be experienced as growth (Tedeschi & Calhoun, 2004). Thus, the hypothesis that religiosity is an indicator of PTG can be considered partially true in the present sample since it was evidenced in only one of the PTG factors.

Concerning the clinical impact statements, currently, little is known about the impacts related to posttraumatic growth (PTG). We empirically observed that the symptom of re-experiencing the trauma in PTSD appears to be associated with positive out-

comes (e.g., recognition of new pathways in life). Individuals exposed to an environment constantly permeated by natural/environmental disasters (e.g., earthquakes and terrorist attacks), presented lower capacity to establish interpersonal relations, more PTSD symptoms, and other detrimental outcomes, when compared to the non-exposed group; and being exposed to a greater number of traumatic events (e.g., bombings, terrorist attacks), and presenting pathological personality traits are associated with lower PTG rates. Moreover, religious adherence is associated with a greater spiritual understanding of negative experiences. These findings provide clinical indicators that may favor the field of psychological counseling and the promotion of aid to those dealing with major life's crises.

In general, although the occurrence of disasters is a promoter of negative and painful psychological implications, research suggests the possibility of occurrence of positive factors such as new life priorities, significant restructurings in interpersonal relationships, as well as a greater sense of personal strength. We can assume the suffering caused by the social inadequacies and consequent impacts of disaster phenomena as highlighting the existential beliefs and assumptions of the victims by promoting a positive restructuring of their personal and social identity.

Overcoming the culture of accommodation, victimization and conformism, and taking reflections to more altruistic, conscious and proactive actions towards the acquisition of civil and humanitarian rights can confer benefits in preventing and solving the problems that permeate the occurrence of disasters and give psychological growth to individuals and communities. However, in order to this be feasible, one must understand that the exercise of citizenship, as well as rights, implies the duty to assume responsibilities regarding political, social and ethical engagement in the face of neglected social needs and realities.

Attitudes such as commitment, perception of personal influence in the face of events in the environment, and the transformation of adverse situations into opportunities for learning and growth are protective of psychological illness in the face of stressful situations (Vázquez, Castilla & Herváz, 2008). Based on that, the inference is made that engagement in the exercise of citizenship through partnerships with political, private and civil entities to change the inadequacies that promote disaster events would be positive initiatives for more adaptive, protective operations, and promoters of personal development against the negative social conditions experienced.

Among the limitations of this study, we can mention the sample size, which was not representative of the populations involved. In addition, the samples were not matched, although they were relatively similar regarding age, marital status and education level. The study also presents a transversal methodological design, not allowing for a comprehension based on causal relationships. In relation to the measures applied, they are relatively brief, not allowing a greater deepening regarding the variables of interest. We highlight that failure to measure the time between exposure to trauma and data collection may have biased the evaluation of PTSD symptoms.

Another limitation referring to the instruments used is that they were developed and investigated in Western cultures and transposed to Eastern contexts. The fact that they are developed predominantly from a Western perspective can have an impact on the evaluation, since in regions where there are ongoing war and political conflicts, trauma and its consequences may present cultural and contextual specificities not always accessed by an external perspective, which is fundamental for the clinical understanding and psychological evaluation (Afana, Pedersen, Rønsbo, & Kirmayer, 2010). Another factor to consider would be the assessment of the posttraumatic contexts where there is a continuous conflict, as is the case in Pakistan. For individuals belonging to ongoing conflict scenarios, the psychological response to each new traumatic event is composed of the history of the past exposures added to the apprehen-

sion about a deeply uncertain future (Afana et al., 2010), which may hinder access and evaluation of what is considered PTG and/or PTSD. In addition, the instruments used were developed to identify clinically significant post-trauma symptoms, but without the scrutiny of mapping languages and local meanings that may eclipse other possible outcomes for traumatic experiences. These tools are based on the social memory of Western groups, such as United States veterans, Latin-American refugees, survivors of torture, or the variety of disorders reported following the terrorist attacks of September 11 (Afana et al., 2010), and it is necessary to develop a more specific understanding of the cultural construction of a "life-threatening event" in non-western contexts (Pedersen, 2002). For these issues, we suggest the replication of the research in larger samples, the realization of longitudinal methodological designs and the construction of systems of illness evaluation and psychological growth based on the specificities and meanings that are intrinsic to the evaluated culture.

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