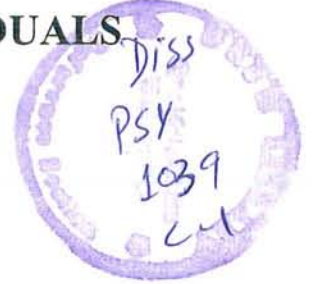


**UNDERSTANDING TRAUMA AND GROWTH IN AN
INTEGRATIVE PSYCHOSOCIAL FRAMEWORK
AMONG FLOOD AFFECTED INDIVIDUALS**



By

Naeem Aslam Chughtai

Dr. Muhammad Ajmal

NATIONAL INSTITUTE OF PSYCHOLOGY

Centre of Excellence

Quaid-i-Azam University Islamabad

2018

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Naeem Aslam Chughtai

A dissertation submitted to the

**Dr. Muhammad Ajmal
NATIONAL INSTITUTE OF PSYCHOLOGY
Centre of Excellence
Quaid-i-Azam University Islamabad**

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IN

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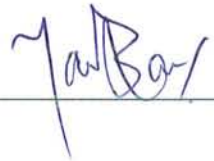
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A handwritten signature in black ink, appearing to read 'A. Kamal', is written over a horizontal line.

Dr. Anila Kamal

Supervisor

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Naeem Aslam Chughtai

ABSTRACT

Numerous studies have detailed the maladies imposed by 2010 floods in Pakistan. However, little work has examined potential benefits gathered in the wake of the flood. After experiencing an adverse event, positive personal change (posttraumatic growth [PTG]), a construct getting expanded consideration in the literature for last couple of years. The aim of this longitudinal study was to understand the trauma and growth in an integrative psychosocial framework. More specifically, the study had undertaken to examine the relationship and psychosocial correlates of posttraumatic stress (PTS) and posttraumatic growth and the trajectory of PTS, distress responses, rumination patterns and PTG across time. For the data, individuals 16 to 64-year-olds ($M = 28.25$ years, $SD = 9.59$), men ($n=1402$) and women ($n=598$) were taken approximately 2 years after flood by utilizing purposive convenient sampling. Data was collected at three time points (T1 [Time 1]), T2 and T3) that were six months apart. At T1 data of 2000 of individuals was taken from different flood affected areas of Pakistan, to be specific: Neelum Valley, Azad Kashmir; Dera Ghazi Khan, Mianwali, and Muzafargarh from Punjab; and Nowshera and Peshawar from Khyber Pukhtunkhwa. For the longitudinal study, one flood affected area, Mianwali (Punjab) was selected for the data of T2 and T3 of the study ($N= 239$; Mean age = 27.50, $SD = 9.85$) men ($n=115$) and women ($n=124$) and ($N= 153$; Mean age =26.75, $SD = 9.56$) men ($n=63$) and women ($n=90$), respectively. T1 data was collected during January 2013; T2 data was collected in July 2013 and the T3 data was collected in February, 2014. Almost 73 per cent of the original sample responded in T2, and 47 percent of the original sample responded at T3.

For the first point of the study, results demonstrated that PTS, intrusive rumination, deliberate rumination, social support, life satisfaction were positively associated with PTG while psychological distress was negatively associated with PTG. Coping strategies such as positive reframing, planning, active coping, and religious coping were positively associated with PTG while; substance use coping and self-blame coping were negatively associated with PTG. Psychological distress, PTS, intrusive rumination, deliberate rumination, and PTG were higher among women as compared to men. Hierarchical regression analysis demonstrated that flood appraisal, social support, psychological wellbeing, intrusive rumination and deliberate

rumination were the significant predictors of PTG. Moreover, active coping, denial coping, positive reframing, planning, humor, religion, and use emotional support were the significant predictors of PTG, while utilization of self-blame coping negatively predicted PTG and overall explained 35 % variance in PTG. SEM results showed that the predictors (i.e., flood appraisal, PTS, intrusive rumination, deliberate rumination, social support and coping strategies) explained 46 % variance to PTG. Model unconstrained results showed that this model can be applicable for both the genders.

Second time point study [T2] was conducted to see the patterns of change across time (i.e., T1 and T2), paired sample *t*-test and ANOVA was computed to see the difference of distress responses, PTS, rumination patterns and PTG crosswise over T1 and T2. Results showed a significant decline in T2 scores on these variables. The same pattern of decline was seen among both the gender at T2. These results were in accordance with the past studies. Regression analysis showed that psychological distress T2 negatively predicted the PTG T2 and deliberate rumination T2 positively predicted the PTG. PTG T1 significantly predicted PTG T2. To see the longitudinal path across time, PTS T1 was the significant predictor of PTS T2 and explained 23 % of variance in PTS T2. Moreover, PTG T1 was the significant predictor of PTG T2 and overall the model explained 24 % of variance in PTG T2.

In the third time point [T3], before taking the data from the flood affected area, that area was again stricken by the flood in August 2013. Repeated Measure ANOVA was used. Results demonstrated a significant increment in the scores on deliberate rumination, PTG and its subscales relating to others, spiritual change, and life appreciation, in T3 as compared to T2. However, there was nonsignificant difference in T1 and T3 on these variables. To see the trajectory of PTS and PTG, both the cross sectional path and longitudinal paths were analysed. Cross sectional paths showed that PTS T1 predicted PTG T1. PTS T2 predicted PTG T2 and PTS T3 predicted PTG T3. Moreover, predictors of PTG T1 explained 13 % variance. Predictors of PTG T2 explained 29 % of variance and the predictors of PTG T3 explained 34 % of variance. To see the longitudinal path across time, PTS T1 significantly predicted PTS T2 and PTS T2 significantly predicted PTS T3. Similarly, PTG T1 significantly predicted PTG T2 and PTG T2 significantly predicted PTG T3

Findings of this study would advance our knowledge in understanding that trauma and growth could be understood in an integrative psychosocial framework. Moreover, it would enhance our insight to the trajectory of trauma and growth among flood affected individuals. Study limitations included the utilization of self-report measures, convenient sampling, and reliance on the retrospective self-reports of survivors, which were often subject to recall and social desirability biases. At the end conceptual issues, theoretical considerations, methodological recommendations for future research, and the implications of these findings for policy, research, and clinical practice are discussed.

INTRODUCTION

Pakistan Floods 2010

Pakistan's vulnerability to natural and technological disasters is characterized by a large number of perplexities such as floods, earthquakes, droughts, cyclones, sea hazards, and landslides, to name but a few. The floods of 1950, 1973, 1976, 1988, and 1992 had resulted in severe loss to life and property, while the 2010 floods have been considered as the most severe and worst in the last eight decades (National Disaster Management Authority; NDMA, 2011). The floods 2010 began on July 27th, after overwhelming rainfall, which continued until September 2010, affecting the entire length of the country. It caused unprecedented damages to Pakistan's infrastructure including, industry, agriculture, communications, and roads. The flood severely impacted people's homes, livestock, and assets (National Rural Support Program, 2011). Almost one-tenth of Pakistan's population has been affected during this flood. It has claimed nearly 2000 lives, 1.8 million houses were damaged and more than 20 million people have been affected in over 30 districts. Besides, this flood has caused extensive environmental degradation and an area of at least 160,000 square km has also been affected (NDMA, 2011).

According to Annual Flood Report (2010) released by Federal Flood Commission, the floods washed away the entire villages. Urban centers have been flooded, agricultural lands have been damaged with major soil erosion occurring in some areas. Furthermore, several main irrigation canals that take water from the Indus River were also flooded. This situation was complicated by additional heavy rains breaching of major canals, embankments, and diversion of the water in an attempt to prevent flooding of the urban areas. Large areas were affected in various extents

because of the continuous rains for further two months. By the mid August 2010, the overwhelming flooding had moved southward along the River Indus from already severely affected Northern districts in Khyber Pakhtunkhwa (KPK) to densely populated areas of Western Punjab and the Southern region of Sindh. In short, floods 2010 are portrayed as a 'slow motion tsunami'. The damage was most noticeable in the mountainous area where many bridges collapsed leaving most of areas completely unreachable for any kind of rescue activities.

National Rural Support Program (2011) in the need assessment report claimed that the overall relief, recovery and reconstruction cost associated with 2010 floods is estimated at almost US\$ 8.74 billion to 10.85 billion (Health Cluster- Pakistan, 2011). In addition, floods of 2010 have caused a noteworthy damage to poverty reduction endeavors, rather resulted in increased poverty and vulnerability of affected population. According to the report of Food and Agriculture Organization (FAO, 2011) of the United Nations that was released one year after the floods, depicted that the families most affected by the floods were predominantly unskilled laborers and poor tenant farmers, who are amongst the most vulnerable groups in Pakistani society. Beyond the billions of dollars in damage, the average Pakistani farming family endured tremendous personal loss, faced shrinking opportunities, and growing debt. The report also claimed that floods caused damages to fisheries, forestry and destroyed primary infrastructure such as tube wells, household storages, animal's sheds, fertilizers, and agricultural machinery.

The sheer human, financial, and environmental costs of this disaster are among the most extensive damages in Pakistan's history. More specifically, the province of Sindh was highly affected, followed by the province of Punjab, KPK, and Balochistan. The extent of damages in Azad Jammu and Kashmir (AJK) and Gilgit

Balochistan were comparatively smaller. According to World Health Organization (WHO, 2011) assessments reports of province-wise damages the relatively more affected districts were. In Sindh: Kashmore, Jacobabad, Qambar Shahdad Kot, Shikarpur, Gotki, Jamshoro, Dadu, and Thatta. In Balochistan: Nasirabad, Jaffarabad, and Sibbi. In KPK: Dera Ismail Khan, Nowshera, Charsada, Peshawar, Kohistan, Swat, and Shangla. In Punjab: Dera Ghazi Khan, Layyah, Rajanpur, Muzaffargarh, Bhakkar, and Mianwali, while in Azad Kashmir; Neelum Valley was among the highly affected areas. Overall, in Punjab, 6,000,000 people that are 6 per cent of the total population of the province have been affected. In Sindh, 7,274,250 (18 per cent); in KPK 3,800,000 (15 per cent); while in AJK 200,000 (6 per cent) population has been affected (National Rural Support Programme, 2011). As per the report of United Nations Office for the Coordination of Humanitarian Affairs (OCHA; 15 Sept. 2010), in D. G. Khan 513,390, Mianwali 705,580, Muzaffargarh 1,044,759 people have been affected. In short, Neelum Valley from Azad Kashmir; Dera Ghazi Khan, Mianwali, and Muzaffargarh from Punjab; Nowshera and Peshawar from Khyber Pukhtunkhwa are declared as the heavily affected districts with respect to the damages of homes, deaths, and injuries.

Recent statistics depicts that floods remain the principle cause of major disaster mortalities worldwide (International Federation of Red Cross; IFRC, 2014). Disasters are events or situations involving ecological and natural disruption, injury or threat to life, that negatively affect many individuals and that overwhelm local capacity for adaptation. Disasters bear health impacts at individual, community, and global levels. Disasters in less developed countries are associated with serious public health issues (Goenjian et al., 1995). That why, for developing countries, a continuous need for identification for post-disaster emotional problems in victims has always

been felt (Kar & Bastia, 2006). Ben-Ezra (2004) demonstrated that the main healthcare problems of the 21st century as far as the developing world is concerned are trauma and posttraumatic stress. The impacts of disasters are more severe in developing countries because of adverse economic conditions, lack of planning, poor infrastructure and inadequate resources to respond the disastrous situations. In addition, disasters are important causes of human suffering in terms of complexity of the mental health problems, poor services to respond the mental health challenges, long-lasting impact on psychological functioning and broad range of psychiatric disturbances (Siqueland, Nygaard, Hussain, Tedeschi, & Heir, 2015). This flood has drastically impacted the lives of a large number of individuals, including children, women, adults, and old age people not only physically but also emotionally. The physical consequences of flood are well documented and quite evident in terms of structural damages, displacements and injuries; however, the psychosocial effects are less obvious.

Adversity Following Natural Disaster

A disaster is an adverse event that is traumatic in nature, which affects the whole community or a larger part of a community. Disasters can overwhelm the accessible community resources and further threaten the adapting capacities and coping abilities of the individuals' as well as the group (Ursano, McCaughey, & Fullerton, 1994). The American Psychiatric Association (APA, 1994) characterizes a traumatic event as an emotionally distressing incident, which is outside the scope of normal human experience that would be noticeably upsetting to nearly anybody. A traumatic event under this definition contains two components; it includes threatened or actual death or having severe injury, and state of complete helplessness or intense

dread (Ursano et al., 1994). Floods (as any other natural disasters), are potentially traumatic events that directly and indirectly affect people in multiple ways. However, there is a substantial variation in mental responses to natural disasters, with reactions ranging from relatively mild to extremely severe or transitory to persistent posttraumatic stress symptoms (PTSS) (Dunn et al., 2014). It is evident that natural disasters are a major cause of the rise in psychological distress, adversities and posttraumatic stress (PTS). In terms of long term morbidity, PTS is arguably the most important of these reactions (Warsini, Buettner, Mills, West, & Usher, 2014) and highly comorbid with anxiety and depressive disorders thus raised degree of other mental illnesses (Byllesby, Durham, Forbes, Armour, & Elhai, 2016; Karakaya, Agaoglu, Coskun, Sismanlar, & Yildiz, 2004; McDermott & Palmer, 1999; Momartin, Silove, Manicavasagar, & Steel, 2004; Pan et al., 2015).

Complexities related to mental health following floods have been extensively described in various empirical studies (Tunstall, Tapsell, Green, Floyd, & George, 2006). For instance, after exposure to a natural disaster; general feelings of distress, negative mood, disorientation, symptoms of generalized anxiety, and posttraumatic stress symptoms have been commonly seen among survivors (Freedy, Shaw, Jarrell, & Masters, 1992; Karakaya et al., 2004). In a study, which was conducted in the context of floods 2010 in Pakistan; Sana and Khattak (2014) reported that this flood was one of the traumatic events. Majority of the flood affected individuals started experiencing mental health issues including flood phobia. Moreover, this flood has left horrifying impacts and unforgettable memories on the minds of victims irrespective of their socio-demographics. Several past studies also reported that exposure to disaster would result in posttraumatic stress (Goenjian et al., 2001;

Kolaitis, 2003; Tunstall et al., 2006; Vernberg, La Greca, Silverman, & Prinstein, 1996), psychological distress, and anxiety (Neria, Nandi, & Galea, 2008; Norris et al., 2002).

Surveys in the U.S. have found 50 to 60 per cent of individuals exposed to a trauma at some point in their lives, had the chance to develop trauma symptoms. The responses are ranging from 5 to 10 per cent among those who are exposed to a natural disaster. However, they vary with the type and the magnitude of the event (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Xu and Liao (2011) one year after the 2008 Wenchuan earthquake among the adult survivors in China, found PTSD prevalence estimate was 40.1 per cent, while the prevalence rates of PTS symptoms were 56.8 per cent, and the prevalence of depression was ranged from 5.8 per cent to 54.0 per cent. Moreover, estimates of PTSD following a disaster range from 30 to 40 per cent among those directly exposed and 5 to 10 per cent for the general population (Galea, Nandi, & Vlahov, 2005). Teodorescu et al. (2012) reported that eighty per cent of the patients had PTS symptoms that were above the cut-off point, and 93 percent showed depressive symptoms. In addition, almost 3 years after the Wenchuan earthquake, nearly, 29.6 per cent of young students reported PTSD, 44.8 per cent reported depression, and 37.6 per cent reported clinical symptoms of anxiety (Pan et al., 2015). Moreover, among the old age individuals who were affected in a natural disaster, the prevalence rates of PTSD, anxiety, and depression were 26 per cent, 42.9 per cent, and 35.2 per cent respectively (Zhang, Shi, Wang, & Liu, 2012). In a study that was conducted in Pakistan, almost half of the northern Pakistan earthquake survivors had symptoms of PTS (Hashmi et al., 2011). Kar and Bastia (2006) demonstrated that one year after a super-cyclone, the prevalence of PTSD, major

depressive disorder, and GAD were 26.9 per cent, 17.6 per cent and 12.0 per cent respectively. The prevalence of probable PTSD was 17.2 per cent and probable depression was 23.1 per cent among the young Iraqi students who were exposed to war trauma (Magruder, Kilic, & Koryurek, 2015). However, there were gender differences in the presentation of the symptoms (Hashmi et al., 2011; Kar & Bastia, 2006).

In a cross sectional study that was aimed to measure the psychosocial impact of volcanic eruption of Mount Merapi in Indonesia, females and adults between the ages of 18 and 59 years experienced the highest levels of psychosocial impact (Warsini et al., 2014). Moreover, 1.8 per cent had profound, 20.4 per cent had severe, 38.3 per cent had moderate and 30.2 per cent had mild symptoms of PTSD. Adolescents were shown to be as vulnerable and at risk for general psychological distress and PTS as adults (Galea et al., 2007). The prevalence of psychological distress and PTS in any population depends on social circumstances and the level of exposure to trauma (Kessler et al., 1995). Mostly studies that are showing the prevalence of PTS and general psychological distress are cross-sectional in nature and do not show the longitudinal trends of these problems, however; there is a need of such studies that show the trajectory of PTS and distress responses across time.

To date much empirical published work on traumatic events has focused on the negative sequel of the adversities (Meyerson et al., 2011). Trauma literature demonstrated that PTS and distress responses are highest immediately after the trauma and then gradually subsidized. For instance, about 90 per cent of individuals typically show a PTSD profile immediately after a big trauma, however, after a few months, a vast majority no longer show these symptoms (Meyerson, Grant, Carter, & Kilmer, 2011). Breslau, Troost, Bohnert, and Luo (2013) showed that not only a

minority of trauma victims, less than 10 per cent develop or remain with PTSD and psychological distress, but also develop some positive changes. In the same line, Koutrouli et al. (2012) reviewed 24 studies published from 1990 to 2010 that examined PTSD and PTG, depicted that, a relatively small percentage of individuals experienced PTSD, while the majority of them reported PTG.

Empirical research into mental health outcomes following trauma is undergoing a revolution as researchers have refocused their efforts to find underlying dimensions and mechanisms of psychopathology and how critical life events offered the possibilities for stress related growth. Quarantelli (1985) reported that positive changes after adversity has far outnumber the reports of psychiatric disorders. Arian, Stopa, Carnelley, and Karl (2016) showed that individual differences after trauma vary considerably and can range from PTS to Posttraumatic growth (PTG). It has been also demonstrated that typically 30–70 per cent of survivors of diverse traumatic incidents reported that they experienced some sort of positive changes of one form or another (Chopko, Palmieri, & Adams, 2017; Linley & Joseph, 2004). This shift to trauma studies has been witnessed across all over the world. To be more specific, this has been a paradigm shift in trauma studies - from posttraumatic stress to posttraumatic growth.

Paradigmatic Shift in Trauma Studies from Posttraumatic Stress to Posttraumatic Growth

The general understanding that suffering and misery can potentially yield positive change is thousands of years old concept (Tedeschi & Calhoun, 2004). However, over the past two decades, PTG has developed into one of the

flagship topics for positive psychology. All through humankind's history the theme of positive changes after affliction is much visible in philosophy, literature, and religion (Caplan, 1964; Frankl, 1963; Maslow, 1970). Some of the early writings of the Greeks, Hebrews, early Christians, and Muslims, and some of the teachings of Hinduism and Buddhism is replete with such examples. Other than this, attempts to fathom and find the significance of human enduring speak to a focal subject of much philosophical quest and appear in the works of dramatists, novelists, and poets (Linley & Joseph, 2004; Tedeschi & Calhoun, 1995). In addition, a lot of folk wisdom describes the human potentials in the face of adversity. For instance “hardships make or break people; difficulties strengthen the mind, as labour does the body; there is no education like adversity; fractures well cured make us stronger; adversity gives one an opportunity to discover the abilities; the gem cannot be polished without friction; nor man be perfected without trials; prosperity is a great teacher; adversity a greater; adversity introduces a man to himself” etc. All these proverbs and folk wisdom suggest the common wisdom or human experiential heritage that explains the same human transformative potentials after adversity. Most noticeable is Nietzsches’ well-known proclamation, “what doesn’t kill me makes me stronger.” It was a thought likewise common to the humanistic and existential traditions of psychology of the mid-20th century.

Investigative and scientific enthusiasm toward ‘positive changes’ after adversity and affliction had started when in the late 1980s and early 1990s handful of studies appeared reporting positive outcomes of the trauma such as PTG (Clay, Knibbs, & Joseph, 2009; Tedeschi & Calhoun, 2004). It accentuates the transformative capability of one's encounter with exceedingly distressing events and

circumstances. It ended up being popular and turned into descriptor for a field of inquiry attracting global attention from academicians, researchers, and professionals (Joseph & Linley, 2008; Weiss & Berger, 2010). Hence, PTG is an emerging area of research, particularly within the field of clinical and health psychology (Bostock, Sheikh, & Barton, 2009). The empirical evidence of PTG has been established in several experimental (Anderson, 2015; Dekel, 2007; Kastenmuller, Greitemeyer, Epp, Frey, & Fischer, 2012) and correlational studies (January, Zebracki, Chlan, & Vogel, 2015; Chan, Ho, Tedeschi, & Leung, 2011; Parikh, 2015). Empirical evidences have highlighted the importance of PTG. It is imperative to capture the actual essence of the phenomena. Below we are presenting the brief overview of the construct PTG.

Overview of Posttraumatic Growth and Related Constructs

The positive changes after adversity have been described through several concepts in the literature and researchers have used various distinctive terms to describe individuals' reports of positive outcomes despite adversity including; benefit-finding, adversarial growth, posttraumatic growth, stress-related growth, positive by-products, perceived benefits, stern, conversion, transformation, flourishing, positive psychological changes (Linley & Joseph, 2004), and thriving. Each of the above mentioned term alludes to a marginally distinctive phenomenon.

In the present study, Tedeschi, Park, and Calhoun's (1998) term of posttraumatic growth (PTG) is used to describe positive changes in one's past level of functioning as a result of struggling with highly traumatic life events. It refers to a betterment following a trauma (e.g., flood), rather than minor day to day stressors; and is a genuine outcome, rather than illusory coping. This term differs from

hardiness, coping, and resilience, which depict individuals who have adjusted effectively regardless adversity (O'Leary & Ickovics, 1995). Past empirical literature showed that positive coping, resilience, and PTG are related, but are distinct constructs (Lepore & Revenson, 2006). PTG refers how adversity can be a springboard to higher levels of cognitive functioning (Park & Fenster, 2004). For example, confronting with a life-threatening situation may serve as an opportunity for self-renewal and personal growth. In an empirical study, Van Ginneken (2014), while working with the sample of prisoners, exhibited that the initial shock of incarceration changed prisoners' assumptive worlds; however, with the passage of time, they managed to overcome this situation by meaning making of this experience and using it as an opportunity for personal development and growth.

The positive changes following adversity are by and large thought to occur in five domains, including, personal strength, new possibilities, life appreciation, relating others, and spiritual change. In other words, person develops more prominent closeness and sympathy for others, identifies new roles and responsibilities in life, develop feelings of personal strength, enhanced spiritually, and a sense of life appreciation (Tedeschi & Calhoun, 2004). PTG theorists, Tedeschi and Calhoun's (2005) found that more the distressing a life circumstance is, the more potential it provides for positive transformations and wisdom is a by-product of the growth (Tedeschi & Calhoun 1995). Besides, considerable factors are reported that promote growth after traumatic events, such as type of trauma. Empirical research demonstrated that less growth is associated with personal traumas for example, physical or sexual assault and more growth is related with shared traumas such as disasters and loss etc. (Kilic, Magruder, & Koryurek, 2016). In addition, PTG has solid conceptual foundations and empirically well studied phenomena.

Conceptual Foundations and Empirical Evidence of Posttraumatic Growth

To date several models have been proposed regarding growth following adversity. The three most detailed models include Christopher's (2004) Bio psychosocial–Evolutionary Theory; Linley and Joseph's (2005) Organismic Valuing Theory; and Tedeschi and Calhoun's (1995, 2004) Functional Descriptive Model. Despite the fact that with some variations, most models postulates that the experience of a traumatic or exceedingly upsetting event violates the persons fundamental beliefs about the self and the world and that some sort of cognitive processing or meaning making to reconstruct of these beliefs take place, resulting in perceptions that one has grown through the process (Tedeschi & Calhoun, 2004). The common thing in all the three models is that, some level of noteworthy distress is apparently important to catalyse the PTG process yet an excess of distress may hinder the likelihood of growth (Joseph & Linley, 2006). Even though offering distinctive levels of explanations at both the biological evolutionary and social cognitive levels, they are complimentary in that they are underpinned by the thought that people are intrinsically spurred towards growth. Taken as a whole, existing models suggest that cognitive processing style is an essential component affecting self-perceived positive changes (Ho, Chan, Yau, & Yeung, 2011; Wittmann et al., 2009). Christopher (2004) articulated that the normal outcome of stress is growth, rather than psychopathology and growth is a self-regulation mechanism associated to the inherent biological propensity (Zoellner, Rabe, Karl, & Maercker, 2008).

PTG is intricate, dynamic and a broad construct that emerges from a development process (Calhoun and Tedeschi, 1998). According to this, the individual's growth is seen solely as a result of the individual struggle with adversity, being influenced by various individual characteristics and environmental factors. By

and large, relations of PTG to other variables may be more complex and dynamic than previously assumed (Tomich & Helgeson, 2012). The subjective appraisal of the traumatic event is what majorly influences the development of PTG. The event is traumatic only if it disrupts the assumptive world and shatters the cognitive mechanisms to comprehend the world. To rebuilt a disruptive narrative, the individual has to engage in cognitive processing (ruminative activity), which, in turn, leads to the growth. Despite the fact that the presence of adversity in the most traumatic events is mandatory, it is, however, not ensured that PTG arises in all trauma situations (Linley & Joseph, 2004). It is not the feature of an event, but the way it is processed, is important for the occurrence of growth. While, meaning making, ruminative thinking, supportive relationships, and coping patterns facilitate growth processes (Mangelsdorf & Eid, 2015).

A lot of empirical work has been conducted to understand the themes of the positive changes after exposing to a traumatic situation. For example, Tsuchiya, Horn, and Ingham (2013) demonstrated that after experiencing an adverse event, participants reported various types of positive changes including, attitudinal changes towards life, enhancement of trustworthy relationships, expanded valuation of life, self-appreciation, and future perspectives. Woodward and Joseph (2003) identified three domains of growth: Inward drive toward growth, desire for change, and psychological changes. Wang, Wang, and Liu (2012) identified four main super-ordinate themes namely, a sense of connectedness, construction of meaning, a changed perception of life philosophy, and a changed view of self. Chun and Lee (2008) used thematic analysis to investigate the narratives of life experiences in patients with spinal cord injury. The three most significant themes of PTG that emerged were meaningful engagement, meaningful relationships with family, and life

appreciation. Moreover, Duran (2013) identified five themes of PTG that included the closeness and family harmony, appreciation of life, self-awareness, meaning-making, and a yearning to pay back society. While from a qualitative study, four prominent themes were extracted including spiritual prosperity, appreciation of life, effective interaction, and stability (Mehrabani, Hajian, Simbar, Houshyari, & Zayeri, 2015). However, Karagiorgou, Evans, and Cullen (2017) identified some additional themes related to optimism or positive attitude, feeling fortunate compared to others, positive emotional and behavioral changes and life style improvements. Guse and Hudson (2014) had identified several psychological strengths, including gratitude, spirituality and hope.

Peterson, Park, Pole, D'Andrea, and Seligman (2008) proposed various cognitive and interpersonal character strengths after a potentially traumatic event. Dirik and Karanci (2008) among the patients with rheumatoid arthritis identified three growth domains that was included philosophy of life, relationship with others, and self-perception. Hefferon, Grealy, and Mutrie (2009) demonstrated the key PTG themes included new existential re-evaluation, trauma equals development of self, reappraisal of life and priorities, and awareness of the body. Morris, Shakespeare-Finch, and Scott (2012) demonstrated that life appreciation was the most noteworthy area of growth. Khanna and Greyson (2015) showed that significant contributions of the spiritual factors in the development of PTG. Besides, many other researchers have partially confirmed Tedeschi and Calhoun's model of PTG and reported different positive constructs while experiencing adversity (Larick & Graf, 2012; Mols, Vingerhoets, Coebergh, & van de Poll-Franse, 2009; Sawyer, Ayers, Young, Bradley, & Smith, 2012; Zhang, Yan, Barriball, While, & Liu, 2015).

PTG have been reported and empirically studied after a variety of traumatic experiences, such as motor vehicle accidents, terrorist assaults, wars, leukemia, natural disasters (including floods and earthquakes), assault, stroke, HIV disease, cardiovascular disease, kidney ailment, inflammatory bowel disease, bone marrow transplantation, limb amputation, rheumatoid arthritis diabetes, childbirth, encephalomyelitis/chronic fatigue syndrome, near-death experiences, and so on (Arpawong, Richeimer, Weinstein, Elghamrawy, & Milam, 2012; Arroll & Howard, 2013; Dirik & Karanci, 2008; Edmondson et al., 2013; Gangstad, Norman, & Barton, 2009; Grubaugh & Resick, 2007; Hungerbuehler, Vollrath, & Landolt, 2011; McMillen, Smith, & Fisher, 1997; Park, Aldwin, Fenster, & Snyder, 2008; Purc-Stephenson, 2014; Raposa, Hammen, & Brennan, 2014; Sawyer, Ayers, Young, Bradley, & Smith, 2012; Solomon & Dekel, 2007; Royse & Badger, 2017; Updegraff, Taylor, Kemeny, & Wyatt, 2002; Wang, Wang, Wang, Wu, & Liu, 2013; Zoellner et al., 2008). Similar findings are obtained in a study done in Pakistan with flood affected individuals (Aslam & Kamal, 2013a).

In a more recent metaanalysis, Elderton, Berry, and Chan (2015) demonstrated that as compared to the others domains of PTG, the highest level of growth were consistently experienced in the domains of life appreciation. Salter and Stallard (2004) found that 42 per cent of participants, who experience an adversity, reported some aspect of PTG, most notably in terms of their philosophy of life. Of these, 37 per cent were also assessed as experiencing PTS. Moreover, between 54 and 79 per cent of the sample reported at least some positive change after injury while that 71.3 per cent of the respondents described interpersonal benefits and 16.2 per cent reported another type of benefits (Danoff-Burg & Revenson, 2005; Kalpakjian et al., 2014). Siegel and Schrimshaw (2000) recognized diverse domains of potential growth among

women. However, some variation was seen in relation with their ethnic/racial background. Sim, Lee, Kim, and Kim (2015) reported that almost 53.3% per cent of the participants experienced moderate to high levels of growth. It is however, interesting to see the distinct nature of growth patterns in flood affected individuals in Pakistan. In addition, PTG is more universal phenomena and has been empirically studied in variety of contexts with the diverse population.

Universality of the Phenomena of PTG

Most research on the experience of such positive psychological changes has been conducted in Western countries, little is known about the experience of PTG in non-Western countries. Few studies have been carried outside of Western developed nations. However, the studies that are conducted outside the Western world also showed the evidences of PTG, irrespective of adverse event type and geographical territory. For instance, Li, Miao, Gan, Zhang, and Cheng (2015) demonstrated that PTG is a widespread phenomenon both in individualistic and collectivistic culture. In a cross-sectional study, Schroevers and Teo (2008) examined the pervasiveness of PTG and its association with psychological distress among the Malaysian sample of patients. Results demonstrated that most of the patients reported PTG in the areas of life appreciation. Rahmani et al. (2012) demonstrated that Iranian cancer patients experienced a moderate to high level of PTG. In another sample of patients of rheumatoid Arthritis, from Turkey (non-western developing country) findings showed almost the same domains of PTG (Dirik & Karanci, 2008). However, the differences in the degree of some PTG dimensions may be due to differences in cultural and psychosocial support factors (Ho et al., 2013).

In a study conducted in India, interregional comparison demonstrated that Taiwan sample depicted higher spiritual and interpersonal PTG scores than the sample belongs to Hong Kong (Thombre, Sherman, & Simonton, 2010). To see the factors facilitating PTG, Zhai, Liu, Wu, and Jiang (2010) investigated the dimensions of growth in the population of mainland China, qualitative phenomenological method was used to see the main themes. The findings were presented under two themes: process of PTG and presentation of PTG. Further findings indicated that there were commonalities between the Chinese sample and Tedeschi and Calhoun's model of the process and outcomes of PTG. Bellizzi et al. (2010) found that African American women survivors demonstrated more positive changes than white women. However, this relation was mediated by religiosity. Likewise, PTG scores in a sample of the UK veterans who had received treatment for PTS were moderately low in comparison to similar studies in the USA (Murphy, Palmer, Lock, & Busuttil, 2017).

A closely linked construct to the PTG is rumination. Some studies have provided the evidences for cultural differences in the role of rumination in PTG. For instance, these were seen in the US and Japanese sample. Deliberate rumination both soon after and recently were positively related with growth in the Japanese sample, while only deliberate rumination recently was positively associated with PTG in the US sample (Taku, Cann, Tedeschi, & Calhoun, 2009). Almost similar positive changes were observed in young Iraqi students and among those who have been affected by the September 11, 2001 terrorist attacks (Magruder et al., 2015; Richardson, 2015). Moreover, Sri Lankan university students who experienced a stressful life event demonstrated the higher PTG. Mangelsdorf and Eid (2015) indicated that negative events are seen as more impactful than positive events in the USA, whereas the reverse is true in India.

In Pakistan, Aslam and Kamal (2013a) conducted the focus group discussions and key informant interviews with the community sample of flood affected individuals who had been severely affected in 2010 floods in Pakistan. Participants' verbatim regarding self-reported positive changes were noted. Results showed that after exposure to flood, participated empathetic feelings, decision making skills, and self-confidence has been increased. Moreover, prayer rate and recitation of Holy Quran has been increased among old age people. Female participation regarding community affairs enhanced. In addition, in response to the devastating Monsoon Floods 2010 in Pakistan, UNDP with major public sector universities of Pakistan launched a comprehensive project that was sought in support of early recovery and restoration services of the flood affected communities. Findings showed the coexistence of both trauma and growth among the flood affected individuals. In another study, with the same flood affected population, Aslam and Kamal (2013b) reported the higher distress responses, rumination (intrusive and deliberate), perceived social support and PTG among flood affected female participants as compared to male counterparts. Moreover, in the recommendations of the same article, the authors emphasized the need of conducting studies that understand the trauma and growth in an integrative psychosocial framework that would give the most comprehensive and balance view of the effects of trauma.

Understanding Trauma and Growth in an Integrative Psychosocial Framework

At a broader level, endeavours have been made to comprehend PTS and PTG in an integrated and comprehensive unified psychosocial framework. Joseph, Williams, and Yule (1995, 1997) presented a multifactorial psychosocial framework of PTG. PTG theoretical work demonstrated that subjective appraisal of a stressor

primarily affects an individual's coping response as well as growth. It is important to understand how trauma appraisal, distress responses, cognitive and social support networks prompts growth. The link of the variables can be explained in such a way that appraisal take the form of automatic or consciously controlled cognitive processes. The occurrence of the emotional and cognitive states prompts various coping mechanisms, in a way that individuals struggle to manage their emotional states and meaning making processes emerges (Marotta-Walters, Choi, & Shaine, 2015). These processes occur in a social context that influences the coping and event cognitions (Cryder et al., 2006). Since the level of emotions related to trauma is high, individuals may require other people support; either experts or those near them, in permitting themselves to remember and talk about the event.

In a systematic review aimed to identify and evaluate researches assessing the co-existence of both PTS and PTG; Schubert, Schmidt, and Rosner (2015) demonstrated that trauma survivors with PTS exhibit more PTG than those without PTS. Moreover, growth and emotional distress may well coexist at times within the same individual (Alisic, Van der Schoot, Van Ginkel, & Kleber, 2008; Cordova & Andrykowski, 2003; Wang et al., 2012; Yonemoto, Kamibeppu, Ishii, Iwata, & Tatezaki, 2012). Likewise, Silva, Moreira, and Canavarro (2012) demonstrated that PTG was frequently reported and co-existed with distress and dysfunction. Tsai, El-Gabalawy, Sledge, Southwick, and Pietrzak (2015) found that veterans who screened positive for PTS reported at least 'moderate' PTG. Moreover, veterans with PTS, those with PTG reported more emotional wellbeing and general health than those without PTG. Similar findings have been presented by Bluvstein, Moravchick, Sheps,

Schreiber, and Bloch (2012) who found that those participants who suffered from PTS also reported PTG and suggested the PTS and PTG are coexisted and interrelated.

It is however important to identify the association between PTS and PTG and whether PTS and PTG are independent constructs or the opposite ends of a single dimension. In a systematic review of the studies published between 1990 and 2012 showed that PTS and PTG seems to be independent constructs, rather opposite ends of a single dimension (Shand, Cowlshaw, Brooker, Burney, & Ricciardelli, 2015). Dekel, and Nuttman-Shwartz (2009) demonstrated that many variables predicted either PTS or PTG, or predicted them differently.

Researches examining the relationship between PTS and PTG among various populations have shown the positive relation between PTS and PTG (Butler et al., 2005; Forstmeier, Kuwert, Spitzer, Freyberger, & Maercker, 2009; Hafstad et al., 2011; Levine, Laufer, Hamama-Raz, Stein, & Solomon, 2008). Likewise, some evidence indicates curvilinear associations between PTG and PTS among traumatized individuals (Dekel, Mandi, & Solomon, 2011; Kleim & Ehlers, 2009; Teodorescu et al., 2012; Yu et al., 2010). Levine et al. (2008) found a significant positive linear relationship between PTS and PTG. Similarly, Yi and Kim (2014) demonstrated that there were linear effects of PTS on PTG. The strength and linearity of PTS and PTG association differed according to age and trauma type (Shakespeare-Finch & Lurie-Beck, 2014). Hafstad, Kilmer, and Gil-Rivas (2011) found that PTS may aid or obstruct PTG, contingent upon the amount of distress experienced as the growth is facilitated and maintained by endorsement rather than absence of trauma (Dekel, Ein-Dor, & Solomon, 2012). Kunst (2012) reported that PTS symptoms were negatively associated with PTG but only among survivors with high levels of peri traumatic

distress. The reason of this heterogeneity of the findings could be related with the intensity of the trauma itself or subjective exposure to it. As reported earlier the event should have the capability to challenge the core beliefs. For example, among the Japanese students who had survived and witnessed in the Great East Japan Earthquake, that occurred on March 2011, findings showed that ruminations were less likely activated and the core beliefs were less likely challenged in Japanese students who were in the area with an approximate Richter magnitude of 4 or lower (Taku, Cann, Tedeschi, & Calhoun, 2015).

Taken as a whole, most of the past literature suggested the positive relationship between the PTS and growth. The question arises that if the PTG and PTS have the same types of correlates or different? Past literature showed that PTS have been associated with depression, anxiety, and distress while, the PTG was not associated with negative feelings such as avoidance, anxiety, and depression (Jaarsma, Pool, Sanderman, & Ranchor, 2006; Shand, Cowlshaw, Brooker, Burney, & Ricciardelli, 2014). In a study with Japanese sample, who had survived in motor vehicle accidents, Nishi, Matsuoka, and Kim (2010) found that some factors of PTG, such as personal strength, appreciation of life, were relating to PTS. More growth was significantly associated with greater predicted risk of recurrent events (Leung et al., 2012). Zhou, Wu, and Zhen, (2017) indicated that the predictive mechanism of PTG and PTS are different and further demonstrated that PTG and PTS are separate, independent dimensions of psychological experiences following adversity. Based on the extensive literature with adults, six types of correlates of PTG have been examined, that included the rumination patterns (e.g., Calhoun, Cann, Tedeschi, &McMillan, 2000); threat appraisals (e.g., Wild & Paivio, 2003); interpersonal/

intrapersonal coping processes (Park et al., 1996); social adaptation outcomes (Milam et al., 2004); PTS/distress responses, demographic and environmental variables (Milam, Ritt-Olsen, & Unger, 2004; Polantinsky & Esprey, 2000).

It is, however, important to understand the mechanism that how the variables (i.e., distress responses, social support, coping mechanisms, and rumination patterns) contribute to PTS and PTG. Moreover, does a reciprocal relationship exist between rumination and PTG? Or what is the nature of the relationship? And how do additional variables impact upon the rumination-PTS, rumination-distress and rumination-PTG relationship?

Rumination Patterns, Posttraumatic Stress, and Posttraumatic Growth

In PTG model rumination is one of the variable that seems to related both with the PTS and PTG. Rumination is one's cognitive engagement and, at times, unintentional process, that's how an individual choose to cope with traumatic event. It involves purposeful cognitive and behavioral activity or one's ability to reflectively engage in cognitive activity. It can be productive and constructive and unproductive and unconstructive (Watkins, 2008). Researchers have generally talked about two types of ruminations; intrusive and deliberate rumination (Taku et al., 2009). Intrusive rumination, negative and unconstructive brooding, is considered unwelcomed incursions of one's cognitive thoughts about an event that one does not choose to bring to mind. It involves a tendency to dwell on the negative outcomes of one's distress (Calhoun et al., 2010). Intrusive thoughts about an event are probably associated with PTS, continued distressed, and anxiety. On the other hand, deliberate ruminations are trying to comprehend events and their implications. It is associated with meaning making and problem-solving (Cadell, 2007; Calhoun, Cann,

& Tedeschi, 2010; Lopez et al., 2009; Martin & Tesser, 1996; Taku, Cann, Tedeschi, & Calhoun, 2009).

The term rumination has procured a negative connotation within the confines of psychological research due to its association with depression and regarded as the maintenance of negative mood and PTS (Calhoun & Tedeschi, 2006; Zetsche, Ehring, & Ehlers, 2009). For example, Nolen-Hoeksema and Morrow (1991) and Nolen-Hoeksema (2000) demonstrated that rumination is predictive of dysphoria. In addition, brooding was related with higher level of PTS (Gate et al., 2013; Soo & Sherman, 2015; Wu, Zhang, Liu, Zhou, & Wei, 2015).

PTG theory (Tedeschi & Calhoun, 1996) uses the more neutral definition to describe the function of rumination. It distinguishes between intrusive; an earlier more intrusive, automatic, brooding style of rumination and later deliberate; a more contemplative and reflective rumination. Compared to intrusive rumination this deliberate rumination is strongly associated with PTG. Calhoun and Tedeschi (2006) demonstrated that in the aftermath of a highly stressful experience reflective cognitive processing is helpful in building a sort of wisdom. So that the disruption caused by the trauma is sufficiently huge to make psychiatric symptoms and shattering to their assumptive world perspective to generate growth (Solomon & Dekel, 2007). In fact, some measure of noteworthy distress may be essential for growth to occur, although too much distress may impair them unable to engage in the growth process (Butler et al., 2005)

Eren-Kocak and Kilic (2014) proposed that growth was predicted by executive functions and not by processing speed or memory, hence, personal growth (domain of PTG), was related to cognitive functions. In a recent study it has been found that intrusive rumination and deliberate rumination predicted PTS and PTG respectively

(Lancaster, Klein, Nadia, Szabo, & Mogerman, 2015). In addition, higher the intrusive rumination, greater would be the PTS and lower the PTG while, higher the deliberate rumination, lower would be the PTS and greater would be the PTG (Taku, Calhoun, Cann, & Tedeschi, 2008). Wolchik et al. (2009) assessed intrusive ruminations and depicted that these were not significantly associated with PTG. On the other hand, Stockton et al. (2011) indicated that intrusive re-experiencing and intrusive ruminative thinking are not significantly related with growth, whereas rumination with more deliberation was significantly positively related with growth. However, some recent researches showed that PTS was associated with both the intrusive and deliberate rumination (Gul & Karanci, 2017). Moreover, intrusive ruminations may prime the process of more deliberate rumination that subsequently facilitates growth. Wilson, Morris, and Chambers (2014) found that intrusive rumination and support from peers directly affected PTG.

A bulk of co-relational studies has shown that trauma-related rumination causally involved in the development and maintenance of PTS avoidance and intrusive symptoms (Borders, McAndrew, Quigley, & Chandler, 2012; Cernvall et al., 2016; Cohen & Numa, 2011; Hong et al., 2010; Moulds, Kandris, Starr, & Wong, 2007; Zetsche, Ehring, & Ehlers, 2009). In addition, intrusive rumination negatively predicted the psychological wellbeing (Hill & Watkins, 2017).

To see the mediating role of rumination, Koutrouli (2015) demonstrated that PTG is indirectly associated with intrusive rumination and psychological distress, through reflective rumination. In addition, deliberate rumination is significantly positively related with PTG when brooding was low (Taku et al., 2011). Collicutt, McGrath, and Linley (2006) demonstrated rumination as a moderator and mediator in

the association between depression and anxiety symptoms. Caspari (2017) demonstrated that depression, anxiety, and perceived threat along with positive cognitive processing accounted for almost 42 % of the variance in growth. Nightingale, Sher, and Hansen (2010) identified the pathways PTS and PTG are mediated by cognitive processing. Moreover, after controlling for objective and subjective trauma severity and intrusive rumination, deliberative rumination was the only significant predictor of growth (Abela & Hankin, 2011; Liao & Wei, 2011; Taku et al., 2011).

Besides ruminative thinking, the PTG model emphasizes the role of social support that plays a critical role in PTS and PTG relationship. For instance, Kim (2017) showed that social support and rumination (deliberate) are noteworthy factors directly affecting PTG. Social support may buffer the adverse consequences of the distress and facilitate the growth. Social support networks reduce the chances of developing severe mental health issues. Notably, it is evident that low social support is related with increased posttraumatic stress and psychological distress (Aciemo, Ruggiero, Kilpatrick, Resnick, & Galea, 2006) and vice versa. In addition, emotional problems are not analogous to medical problems. They are not simply of problems within the person; instead, they develop in persons interactions with the environment. This demands to look into a much complex interplay of psychosocial factors. In the context of Pakistani culture, we would examine that what social support networks are available and how social support networks in our culture are assessable and how social support networks play their role and explain and/or influence the growth process.

Role of Social Support in the Relationship between PTS and PTG

Social support has been viewed as support available to an individual through social binds to other people, groups, and the larger community that is accessible in times of need to give physical, psychological, and/or financial help (Lin, Simeone, Ensel, & Kuo, 1979). Perceived support has been described as the “subjective perceptions of the extent to which social network members are available to provide social support” (Cohen & McKay, 1984). Support networks facilitate or thwart ruminations and cognitive processing, thus lead to heterogeneous growth outcomes. For elaboration of these phenomena, social cognitive processing theory is helpful to understand the effect of the social context on growth. To see the relationship between the social support and PTG, there are mixed findings. Lotfi-Kashani, Vaziri, Akbari, Kazemi-Zanjani, and Shamkoeyan (2014) demonstrated that perceived social support have direct significant relationship with PTG. Wolchik et al. (2009) concluded that seeking support from parents/caregivers and seeking support from significant others at baseline predicted PTG six years later. Others showed non significant relationship between social support and PTG (Kilmer & Gil-Rivas, 2010; Morris, Chambers, Campbell, Dwyer, & Dunn, 2012; Park, 2006). However, findings are varied based on the source of social support.

Research literature showed that family support and perceived mutual support from peers was positively correlated with PTG (Benetato, 2011; Dirik & Karanci, 2008; Gul & Karanci, 2017; Kimhi, Eshel, Zysberg, & Hantman, 2009; Yu et al., 2010). Moreover, studies also demonstrated that support from family and friends were significantly and positively related with the development of positive growth. Furthermore, social processes, emotional support or instrumental support can be a

mean to foster and development of PTG. whereas, instrumental support was the unique predictor of PTG (Cryder et al., 2006; Mo, Lau, Yu, & Gu, 2014; Li, Cao, Cao, Wang, & Cui, 2012; Nenova, DuHamel, Zemon, Rini, & Redd, 2013; Tanriverd, Savas, & Can, 2012). Love and Sabiston (2011) found that stress and social support were significant predictors of psychological growth, whereas, lack of social support is the strongest predictors of PTS (Brewin, Andrews, & Valentine, 2000). The factors with greatest influence on PTG in the survivors were the social support and frequency of religious activities (Jeon, Yoo, Kim, & Lee, 2015). La Greca et al. (1996) demonstrated that adolescents who perceived low social support following Hurricane Hugo were more likely to experience depression.

Cieslak et al. (2009) found that among Hurricane Katrina survivors living with HIV, perceived social support was directly linked to relating to others an index of PTG. Similar results were obtained across the other indices of PTG (Hill & Watkins, 2017). Swickert and Hittner (2009) found that social support and coping was a partial mediator of the relationship between gender and PTG while social support perceived from a private person serve as a moderator (Bozo, Gundogdu, & Buyukasik-Colak, 2009). Taku et al. (2008) demonstrated that significant others support would corroborate survivors' cognitive and behavioral reports of PTG. Whereas, among cancer patients social support was positively associated with PTG and subjective well-being, and stress was positively associated with PTG and negatively associated with subjective well-being, whereas, spirituality and social support were found to have a positive relationship with PTG (Cadell et al., 2003; McDonough, Sabiston, & Wrosch, 2014). Furthermore, results of Vishnevsky et al. (2010) meta-analysis showed that family support and threat appraisals partially mediated the relationship

between gender and growth such that males experienced less family support and less sense of danger as compared to females, as family support and sense of danger decreased, PTG increased. Benyamini, Ein-Dor, Ginzburg, and Solomon (2009) demonstrated that social support coping mediated the relationship between gender and PTG while social support coping was a partial mediator of the relationship between gender and PTG (Yi, Zebrack, Kim, & Cousino, 2015). Moreover, Meyerson et al. (2011) demonstrated that the social support moderate the relationship between PTS and PTG. Moreover, social support negatively predicted psychological distress, and positively predicted psychological wellbeing (Hill & Watkins, 2017).

In addition to social support and rumination patterns, coping strategies employed by the survivors has been considered a major factor that facilitate the process of PTG. Hence, coping strategies may be the predictors of PTG or act as a mediator as well as moderator between PTS, ruminations, and PTG. For instance, Bussolari et al. (2017) indicated that social support predicted adaptive coping that subsequently predicted growth. Hence, adaptive coping acted as a mediator in the relation between social support and PTG. It entailed that both coping and social support (i.e., internal cognitive processes and external support) are required for positive changes.

Coping Mechanisms, Posttraumatic Stress, and Posttraumatic Growth

Coping strategies are specific conscious efforts, both behavioral as well as mental, that an individual uses not only to tackle personal and interpersonal issues but also decrease or minimize stressful events/conflicts (Folkman & Lazarus, 1980). The relationship between coping and PTG is well documented and an evidence-based

review of coping strategies related to PTG distinguished key coping strategies and factors that enhance coping processes (Arikan & Karanci, 2012; Manne et al., 2004; Rajandram et al., 2011). For instance, January, Zebracki, Chlan, and Vogel (2015) showed that PTG was significantly associated with behavioral and cognitive coping strategies, as well as with increased life satisfaction but was unrelated to psychological distress.

Garnefski, Kraaij, Schroevers, and Somsen (2008) demonstrated that a significant amount of variance in growth was explained by the coping strategies people used to handle their adversities. For instance, people who have the capacity to actively cope with problems in their life or use positive reinterpretation report more PTG (Gul & Karanci, 2017). Moreover, use of active positive coping, problem-focused coping, religious coping, venting, reappraisal coping, religious, and acceptance coping strategies are more likely to experience positive changes (Ai, Hall, Pargament, & Tice, 2013; Frazier et al., 2009; Kinsinger et al., 2006; Koutrouli, Anagnostopoulos, & Potamianos, 2012; Loiselle, Devine, Reed-Knight, & Blount, 2011; Jeon, Yoo, Kim, & Lee, 2014; Joseph & Regel, 2010; Ho et al., 2004; Prati & Pietrantoni, 2009; Sattler, Assanangkornchai, Moller, Kesavatana-Dohrs, & Graham, 2014; Shand et al., 2014; Turner-Sack et al., 2012; Ullman, 2014). However, quite contrary, Helgeson et al. (2006) reported that PTG is negatively related to denial coping, religiosity, substance abuse coping, maladaptive coping, negative social reactions from others, and PTS symptoms. Milam et al. (2004) and Najarian, Goenjian, Pelcovitz, Mandel, and Najarian (1996) demonstrated that religiosity, positive reappraisal, acceptance and denial were positively related with PTG whereas

substance use coping was negatively correlated with growth (Arpawong et al., 2014; Cryder, Kilmer, Tedeschi, & Calhoun, 2006; Yonemoto et al., 2012).

Yeung, Lu, Wong, and Huynh (2015) after controlling demographic variables and the level of current distress, demonstrated that positive reframing and acceptance coping were related to higher growth. Gangstad et al. (2009) demonstrated that PTG is positively associated with four domains of cognitive processing, including, downward comparison, positive cognitive restructuring, denial, and resolution, while negatively associated with depression. Thornton and Perez (2006) examined growth in men treated for prostate cancer and their spouses one year after surgery. Higher levels positive reframing and emotional support coping were related with higher levels of growth one year after surgery.

Byra (2015) found that in spinal cord injury patients, coping strategies such as religion focus on the problem and humour coping jointly account for 60 per cent of variance of PTG. The highest contribution to accounting for this variability had religion. Lechner, Carver, Antoni, Weaver, and Phillips' (2006) assessed women participants at two time points; after surgery (T1) and 5-8 years later (T2). The associations between PTG and various indicators of psychosocial adjustment were examined. High PTG group reported more use of religious coping and positive reframing. Ho, Chan, and Ho (2004) showed that as compared to negative coping positive coping was the most important predictor of PTG. In the process of PTG, both avoidance and problem-focused strategies are important. However, Bellizzi and Blank (2006) in a cross-sectional study showed that active coping accounted the significant variance in different domains of growth, such as new possibilities, relationships with others, and life appreciation.

In another study, participants in a follow-up study, had completed a survey thirty months after surgery. Oginska-Bulik (2014) with the sample of 80 medical rescuers who had experienced traumatic event in their worksite were analyzed, revealed that the strategy "turning to religion" plays the major role in PTG while, greater spirituality predicted more PTG (Smith, Dalen, Bernard, & Baumgartner 2008). Sears, Stanton, and Danoff-Burg (2003) reported that reappraisal coping, benefit finding, and PTG had distinct significant predictors. Reappraisal coping positively predicted perceived health and positive affect at 3 and 12 months and PTG at 12 months. High level of PTG is related with more use of healthy coping strategies including; instrumental support, active coping, venting, denial, and emotional support (Boals & Schuler 2017; Perez-San-Gregorio, 2017). In addition, adaptive coping strategies such as, positive religious coping, problem-focused coping, and positive reframing may act as protective factors against distress and act as a foundation for growth (Dirik & Karanci, 2008; Lafarge, Mitchell, & Fox, 2017; Park, 2017). While, Schmidt, Blank, Bellizzi, and Park (2012) proposed that the religious coping and the positive reframing mediated the relationship for the PTG.

Park et al. (2008) revealed that positive coping was associated to PTG than to PTS, while negative coping was more strongly related to stress than to growth. Similarly, among the veterans who were caught and held as prisoners of war during the Vietnam War, almost the whole sample showed moderate use of religious coping (Feder et al., 2008). Turner-Sack, Menna, and Setchell (2012) while working with the patients of substance abuse reported that use of less avoidant coping predicted low distress. Whereas, perceived positive changes were related with greater meaning-focused coping and with reappraisal of worldviews (Thombre et al., 2010). In

addition, beliefs about the meaningfulness of the world are among the most important contributing factors to growth (Cryder et al., 2006; Forstmeier et al., 2009; Valdez & Lilly, 2015).

Hussain and Bhushan (2011) exhibited that positive refocusing and planning coping partially mediated the relationship between adverse event and growth. Thombre et al. (2010) demonstrated that reappraisal of worldviews was the another strongest predictor of PTG and religiosity predicted maintenance or increase in PTG or PTG may reflect individuals coping efforts (Occhipinti, Chambers, Lepore, Aitken, & Dunn, 2015; Tsai, Sippel, Mota, Southwick, & Pietrzak, 2016). To see the predicting role of coping on PTG, it was found that those who use more positive coping such as “reappraisal coping” demonstrated more growth (Felix et al., 2015). On the basis of past literature, it has been concluded that PTS and PTG coexist and a considerable amount of stress is required to trigger PTG. Psychological distress and intrusive rumination prompts deliberate rumination. The deliberate rumination tries to reconcile the trauma with one's representational world in order to create meaning out of the event. Social support networks and coping efforts used by person influence the whole process.

Aslam and Kamal (2014) with the sample of flood affected individuals in Pakistan has proposed the discrete coping predictors of PTS and PTG. In addition, PTG helps in reducing the negative distressing symptoms and enhancing the wellbeing and positive mental health outcomes in an individual.

Psychological Wellbeing, Life Satisfaction, and PTG

Considerable studies showed that growth is found to be positively associated with a wide range of positive psychological health resources such as wellbeing and life satisfaction (Currier et al., 2009). For instance, Helgeson et al. (2006) in a meta-analytic review examined a wide range of traumatic events including natural disasters and inferred that PTG was associated with low depression and high wellbeing. Ben-Zur, Cohen, and Gouzman (2014) demonstrated that PTG was positively associated with psychological wellbeing, psychosocial functioning, positive emotions and social support while PTS was negatively associated with these variables (Arpawong, Oland, Milam, Ruccione, & Meeske 2013; Bates et al., 2004; Anand-Kumar, Kung, Painter & Broadbent, 2014; Helgeson et al., 2006; Hullmann, Fedele, Molzon, Mayes, & Mullins, 2014; Li, Yeh, Chen, Chang, Pi, & Fang, 2015). Empirical literature has supported that PTG is negatively associated with anxiety symptoms (Milam, Ritt-Olsen, Tan, Unger, & Nezami, 2005); psychological distress (Vaughn, Roesch, & Aldridge, 2009); and general stress symptoms (Kimhi et al., 2009; Ickovics et al., 2006). Casellas-Grau, Ochoa, and Ruini (2017) depicted that PTG was negatively related with depressive thoughts, anxiety symptoms, hopelessness, negative affect, and directly associated with hope, optimism, and spirituality, meaning and better adaption. In addition, perceived level of PTG was associated with greater positive affect, better quality of life, satisfaction with life, and more effective emotion regulation (Itzhaki et al., 2015; Yu et al., 2014).

Mosher, Danoff-Burg, and Brunker (2006) reported that life satisfaction was positively associated with PTG. In addition, women who reported more life satisfaction also reported higher levels of PTG. Sawyer, Ayers, and Field (2010)

reported PTG among patients with HIV/AIDS. Results demonstrated that growth was associated to better subjective physical health, increased positive emotional health, and reduced negative mental health. However, in case of low stress, PTG was not associated with life satisfaction (Birkeland, Hafstad, Blix, & Heir, 2015). Besides, higher levels of PTG buffered the negative effects of psychological distress (Dunigan, Carr, & Steel, 2007; Shen et al., 2014; Silva et al., 2012). In the same line, Bluvstein et al. (2012) concluded that PTG may attenuate the negative effect of PTS while survivors with higher levels of PTG showed deeper meaning in life and better functional well-being (Kashdan & Kane, 2011; Sim, Lee, Kim, & Kim, 2015).

In addition to the positive outcomes of the PTG or the positive mental states that are associated with PTG, there are certain demographic variables that are related to PTG. Mostly these variables moderate the relationship between PTS, distress, and PTG. Similarly these demographic such as gender, age, coping style, education, socioeconomic status (SES) and marital status play the distinct but significant roles in PTS, distress, and PTG.

Role of Demographics in the relationship between PTS and PTG

People experience a disaster in their own and unique way. However, what happens to persons during and after a disaster varies from individual to individual and is influenced by what they witnessed, perceived, and feared. However, demographic variable such as age, gender, marital status, education, and SES as well as the trauma characteristic or the survivors characteristics such as trauma appraisal, trauma severity, time elapsed since trauma, are the important factors that are expected to play

the role or they moderate the relationship between trauma and PTG (Kolokotroni, Anagnostopoulos, & Tsikkinis, 2014; Meyerson et al., 2011; Perlick et al., 2012).

Age. To see the relationship of age with PTS and PTG after trauma, there is heterogeneity of findings. For instance, Norris et al. (2002) found that the most affected population during the disaster was the youth, middle-aged adults, and older adults. However, most severe impairment was seen in youth. Moreover, Phipps, Long, and Ogden (2007) and Currier, Hermes, and Phipps (2009) reported positive relation between age and PTG; while, Laufer and Solomon (2006); Helgeson et al. (2006); and Yu et al. (2010) reported negative relationship; whereas, few others found no relationship between these two variables (Kilmer et al., 2009; Taku et al., 2011).

Numerous literature showed that younger age was a significant predictor of PTG (Joseph & Regal, 2010; Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003; Tanyi et al., 2015). Young survivors perceived stressor as threatening and experienced more growth which suggested that threat appraisals mediated the relationship between age and growth (Kimhi et al., 2010). Moreover, younger participants having engaged in both intrusive and deliberate ruminative activity depicted more growth (Taku, Cann, Tedeschi, & Calhoun, 2015; Ullman, 2014). Hall et al. (2008) reported the best predictors of probable PTS were being older. However, older individuals showed more enhanced spirituality, one domain of growth (Tallman, Shaw, Schultz, & Altmaier, 2010). Moreover, age and gender moderated the relationship between coping and growth in a way that religious coping facilitated growth in older survivors and women (Prati & Pietrantonio, 2009).

Gender. To see the relationship between the gender and PTG, some studies showed higher PTG for women (Joseph & Regel, 2010; Laufer & Solomon, 2006; Laufer, Hamama-Raz, Levine, & Solomon, 2009; Vishnevsky et al., 2010) and few others reported higher rates for male survivors (Kimhi et al., 2009) and some did not find any significant difference on the basis of gender (Hafstad et al., 2011; Wolchik et al., 2009). For instance, among the limb amputations sample, overall, women reported moderate-to-high PTG scores as well as greater trauma related distress than males (Carr, Lewin, Webster, & Hazell, 1995; Stutts, Bills, Erwin, & Good, 2015). Kimhi et al. (2009) demonstrated in a study that was conducted after the Lebanon War, that young Israeli males reported more growth as compared to females. Bellizzi (2004) demonstrated that females reported positive changes on four domains of PTG, and the older individuals reported lower levels of PTG compared with the other groups (Cobb, Tedeschi, Calhoun, & Cann, 2006). However, no sex difference were seen on the domain of 'new possibilities' (Bates, Trajstman, & Jackson, 2004; Taku et al., 2007). Furthermore, the association between PTG and PTS was stronger among males than females (Magruder et al., 2015). However, women with higher depressive symptoms presented lower levels of PTG than women without (Hirooka, Fukahori, Taku, Togari, & Ogawa, 2017; Romeo et al., 2017).

To see the gender difference on PTS and distress responses, Norris et al. (2002) on the basis 49 articles demonstrated that almost 46 (94 per cent) studies showed that females' population was more adversely affected, regardless of whether they were adults, adolescents or children, or whether the event was a technological disaster, natural disaster, or an event of mass violence. Moreover, girls and women

were at least twice as vulnerable as boys and men. The only exception was abuse alcohol (Gleser, Green, & Winget, 1981; North, Smith, & Sptiznagel, 1994).

To see the gender difference on coping, there are heterogeneous findings. In a meta-analysis, Tamres, Janicki, and Helgeson's (2002) found that females mostly perceive the stressors threatening as compared to their counterparts. Hastings, Anderson, and Kelley (1996) found that females scored significantly higher in denial, venting, acceptance, to seek instrumental support, and emotion focused coping. Furthermore, women tended to blame themselves more and use denial coping (Rokach, 1999; Schwab, 1990) while males have been shown to use humour, acceptance, positive reframing, substance abuse, and focusing on emotions as a coping strategy (Hastings et al., 1996; Plancheral & Bolognini, 1995; Sigman et al., 1996). Rijavec and Brdar (1997) also reported the higher levels of instrumental and emotional supports in females. Other studies demonstrated gender difference in active coping and religion religious coping (Matuszek et al., 1995; Sullivan, 2002).

Socioeconomic status and PTG. To see the association between socioeconomic Status, PTS and PTG, there are also mixed findings. For example, Currier et al. (2009) showed positive relationship between SES and PTG (i.e., with the increase in SES the growth would increase). Cormio et al. (2017) depicted that growth was related with employment. In addition, Linley and Joseph (2004) depicted that growth is associated with higher SES and higher income. Quite conversely, Posluszny, Baum, Edwards, and Dew (2011) demonstrated that higher income level was negatively related to PTG. Grubaugh and Resick (2007) also demonstrated that low monthly income was related with low growth.

To see the predicting role of SES, Kimhi et al. (2010) demonstrated that economic conditions not only predicted stress but also PTG. It has also been identified that household income, economic status, and educational level positively influenced PTG and negatively influenced the PTS (Koutrouli et al., 2012; Rajkumar, Mohan, & Tharyan, 2013; Wang et al., 2014).

Education and PTG. To see the relationship between the education and PTG, there are also mixed findings. For instance, Grace, Kinsella, Muldoon, and Fortune (2015) demonstrated the PTG was positively associated with the education. The PTG levels were higher when participants had higher educational levels (Cormio, Muzzatti, Romito, Mattioli, & Annunziata, 2017; Hall et al., 2008; Jeon, Yoo, Kim, & Lee, 2015; Linley & Joseph, 2004). In addition, Grubaugh and Resick (2007) demonstrated that low education level were associated with lower levels of PTG.

Quite contrary, Ullman (2014) showed that less education were significantly related to greater PTG. For adults, the significant predictors of PTS were poor education, and loss of employment or property a result of the disaster (Koutrouli, Anagnostopoulos, & Potamianos, 2012; Tang, Liu, Liu, Xue, & Zhang, 2014).

Marital status and PTG. After exposure to a disaster, past empirical work has demonstrated a significant increment in marital stress (Norris & Uhl, 1993). Few other studies have reported that marital status is actually a risk especially for women (Norris et al., 2002). However, for men, marriage may protect against stress (Solomon, 2002). For instance, in a study that was conducted in the context of “Buffalo Creek dam collapse” in 1972, results showed that married women had more

posttraumatic stress symptoms as compared to unmarried women (Gleser et al., 1981). To see the relationship between marital status and PTG, married individuals showed high levels of PTG as compared to unmarried participants (Ho et al., 2011). For instance, in a systematic review, Harding, Sanipour, and Moss (2014) found that demographic factors cohabitation/marriage is associated with increased PTG.

Trauma appraisal and PTG. Following a disaster, psychiatric morbidity is not only related with intensity and magnitude of the disaster, but also it is related with many other factors such as; the nature of subjective appraisal to the trauma, exposure to the death, injury or loss, risk of recurrence of disaster, lack of controllability/predictability, and the level of destruction of community infrastructure etc. (Davidson & McFarlane, 2006). Past empirical literature has depicted that subjective stress or subjective cognitive appraisal of the event is associated with growth (Taku et al., 2009; Stump & Smith, 2008). Combined with previous research findings, the relationship between PTS and PTG may depend on the type and severity of the trauma, the exposure level (Morrill et al., 2008; Wei, Han, Zhang, Hannak, & Liu, 2017). In addition, positive ruminative thoughts mediated the pathways between perceived physical threat and growth (Caspari, 2017). However, disaster-related subjective fear was positively associated with growth only among those with stronger philosophies (Laufer, Solomon, and Levine, 2010; Sumer, Karanci, Berument, & Gunes, 2005)

To see the predicting role of the appraisal to trauma, many studies showed that subjective trauma severity found to be a predictor of PTG and greater perceived life

threat, events involving threat to self has been associated with PTG (Barakat, Alderfer, & Kazak, 2006; Devine, Reed-Knight, Loiselle, Fenton, & Blount, 2010; Lopez, Camilli, & Noriega, 2014; Morris, Shakespeare-Finch, Rieck, & Newbery, 2005). Connerty and Knott (2013) reported that the more severe the loss had been rated, the higher the levels of PTG (Armstrong & Shakespeare-Finch, 2011). The possible reason could be that a moderate severity of trauma evokes distress that subsequently evokes cognitive processing that is important for engendering PTG (Gangstad et al., 2009; Kashdan & Kane, 2011).

Helgeson et al. (2006) and Najarian et al. (1996) demonstrated that growth was positively related with the perception (subjective) of stress associated with the event, objective severity of the trauma, and intrusive-avoidant thoughts. However, intrusive symptoms may be important in developing and maintaining of PTS that subsequently predicts PTG (Lawrence-Wood, Van Hooff, Baur, & McFarlane, 2016). Moreover, witnessing somebody seriously injured during disaster is one of the significant predictor of PTS and distress (Hizli, Taskintuna, Isikli, Kilic, & Zileli, 2009; Pan et al., 2015). However, there is lack of empirical evidences that showed that rescue workers may appraise the trauma in similar way as the case with the lay person.

Trauma severity and PTG. Most of the past empirical work had shown a positive association between trauma severity and PTG (Hafstad et al., 2010; Miller, 2008; Rajandram et al., 2010). For instance, Helgeson et al. (2006) and Najarian et al. (1996) demonstrated that growth was positively associated to trauma related thoughts, subjective appraisal, and objective severity. Goenjian et al. (2001) demonstrated that

the severity of trauma followed a "dose-of-exposure" pattern. For instance, Laufer and Solomon (2006) demonstrated the evidence of curvilinear relationship between trauma exposure and growth. The strongest association between exposure and growth was seen among those survivors who had moderate exposure to trauma. However, certain personality and socio environmental variables may mediate the relationship between the objective trauma exposure and growth (Dong et al., 2014; Dong et al., 2015; Martin, Byrnes, McGarry, Rea, & Wood, 2017). On the other hand few studies did not show any significant relation between objective trauma severity and growth (Cryder et al., 2006; Park, 2006; Yaskowich, 2003). Hence, the question arises, whether the nature of adverse event differentially influences growth or how much amount of trauma is required to engender growth? To see the association between time elapsed since trauma and PTG, few studies have found positive relation between elapsed time since trauma and PTG (Barakat et al., 2006; Phipps et al., 2007; Wolchik, Schenck, & Sandler, 2009) whereas, found no noteworthy relationship between elapsed time and PTG (Currier et al., 2009; Milam et al., 2004).

The current study would be examining the moderating role of above mentioned demographic and environmental variables that how they influence the relationship between the PTS and PTG? In addition, much literature is available that depicts the trajectory of PTS and PTG. Although majority of these studies are cross sectional in nature, preclude conclusive determination of causality and etiology have been conducted with the cancer patients and very few studies are conducted with individuals with natural disaster. However, after explaining the cross sectional psychosocial and demographic correlates of PTG, it is important to mention the longitudinal psychosocial correlates of PTS and PTG. It would be helpful to better

comprehend whether there are same longitudinal psychosocial correlates of PTS and PTG and whether PTS and PTG are influenced by different mechanisms.

Longitudinal Correlates Posttraumatic Stress and Posttraumatic Growth

To examine the longitudinal correlates of PTS and PTG, there are mixed findings. Some longitudinal studies found the strong positive associations between PTG and concurrent PTS. For instance, in a study in which data was taken at two time points [T1 and T2], it was found that PTG T1 was the significant predictor of PTG T2 and both types of rumination play an important role in PTG T2. Moreover, avoidance symptoms of PTS, social support, and positive coping were significant predictors of PTG (Brix et al., 2013; Holgersen, Boe, & Holen, 2010; Kilmer et al., 2011; Su & Chen, 2015; Wang et al., 2013). Kilmer and Gil-Rivas (2010) demonstrated that PTS predicted growth over time but not vice versa. Erbes et al. (2004) showed that PTS at baseline predicted PTG five years later. However, Zebrack et al. (2014) demonstrated non significant relations between overall PTS severity and PTG at 12-month follow-up. In terrorist attacks in the USA, Davis and Macdonald (2004) reported that greater perceived threat and initial distress is positively associated with the provision of the help after the disaster. Moreover, the degree of perceived threat and initial distress continued to associate positively with life change reports (PTG) at the later point in time.

Danhauer et al. (2013) reported that younger age and greater number of days from baseline were related with higher PTG over the period of time. However, severity of trauma symptoms, greater number of days from baseline, and poor spiritual well-being was related with higher distress. McDonough et al. (2014) showed that the social support and stress predicted increased levels of growth.

However, the variable related to PTS trajectory were the trauma exposure severity, greater adversities in life after trauma, financial problems, and lower education (Pietrzak, Van Ness, Fried, Galea, & Norris 2013).

Moreover, Cadell et al. (2003) using a prospective longitudinal design after controlling for baseline emotional distress and social support, stressors predicted the PTG. Solomon and Dekel (2007) in a prospective study, with the ex-prisoners of war while studying the pathological (PTS) and Salutary (PTG) outcomes, found both linear and quadratic associations between PTS and PTG were evident. Wolchik, Coxe, Tein, Sandler, and Ayers (2008) controlling for threat appraisals, time since death, seeking support from other adults, parents or guardians, avoidant and active coping were significant predictors of PTG. Scrignaro, Barni, and Magrin (2011) in a longitudinal study, collected data at two time points with the space of 6 months. Results showed that problem-focused coping significantly predicted T2 PTG.

Zhou, Wu, and Chen, (2015) assessed the 2008 Wenchuan earthquake survivors at three time points: almost after the 3.5 years, 4.5 years, and 5.5 years later. The findings depicted that PTS T1 and T2 predicted PTG T2 and T3. Cross-sectional association between PTS and PTG weakened from T1 to T3 and authors concluded the coexistence of PTS and PTG. Chen, Zhou, Zeng, & Wu, (2015) found that PTS at 12 months did not predict subsequent PTG. However, PTG at 12 months post-earthquake predicted fewer subsequent, hyper-arousal and intrusions symptoms. Ickovics et al. (2006) showed that higher PTG predicted lower distress up to 12 and 18 months after the traumatic incident. In another prospective longitudinal study, in a sample of former Israeli prisoners of the “Yom Kippur War”, personality factors, socio demographic variables, social support, and trauma exposure were measured in

1991, and PTG and PTS were measured in 2003. Results demonstrated that loss of control and active coping during captivity predicted both trauma and growth (Dekel et al., 2011; Dekel, Levin, & Solomon, 2015).

Zhou and Wu (2016) delineated that after trauma, intrusive rumination predicts PTS, while deliberate rumination predicts PTG. Hence, trauma and growth are influenced by different mechanisms. In the similar study, authors demonstrated that the association of intrusive rumination T1 to PTS was partly mediated by the intrusive rumination T2. The relationship of intrusive rumination T2 and PTS/PTG T3 was mediated by deliberate rumination T2. In addition, deliberate rumination significantly predicted PTG T2 and T3. However, the predictive effect between deliberate rumination and PTG was not stable over the time (Zhou & Wu, 2015). In another longitudinal study, after controlling the effect of PTG T1, intrusive rumination predicted PTG T2. In addition, a reciprocal intrusive rumination to anxiety relationship was found over time (Kilmer & Gil-Rivas, 2010; Jose & Weir, 2012). Kunst (2010) on the basis of longitudinal study concluded that peritraumatic distress enables PTG after considerable time has passed.

In another study, to see the effect of rumination on trauma and growth, 376 students were assessed almost after the three years of Wenchuan earthquake. Findings showed that the association of intrusive rumination soon after the event and PTG was partly mediated by “recent intrusive ruminations”. Moreover, the relationship between intrusive rumination soon after the event with PTS was partly mediated by recent intrusive ruminations and the relationship between recent intrusive rumination with PTG was partly mediated by recent deliberate rumination (Wu, Zhou, Wu, & An, 2015).

Silva et al. (2012) reported that coping through seeking social support at T1 were related to depression at T3. Sattler et al. (2014) after Indian Ocean tsunami, Thailand found that distress was higher among respondents surveyed at 3 months as compared to those surveyed at 15 months with the significant reductions in PTG, depression, and anxiety from baseline to follow-up. Moreover, increase in social support and religious coping was associated with increases in PTG over time and the relationship between social support and PTG were mediated by coping strategies (Leong & Abdullah, 2015).

Besides, there are still the questions that after exposure to traumatic situation how much amount of time is needed for the development of PTG or how much time interval is needed to see the changes in growth and trauma trajectories? There are mixed findings in literature, Frazier, Conlon, and Glaser (2001) believed that PTG increase with time, while others (Tartaro et al., 2005) demonstrated that PTG decrease with time. However, some others (Helgeson et al., 2006; Moore et al., 2011; Powell, Gilson, & Collin, 2012) reported that it is relatively stable phenomena. It is imperative to understand the trajectory of trauma and growth responses in the light of previous empirical research and how the past longitudinal studies demonstrated the pattern of change over the period of time?

Trajectory of Trauma, Rumination, Coping, and PTG

Trajectory of trauma, distress responses and PTG has been the areas of interest of most of the researchers. Powell, Ekin-Wood, and Collin (2007) demonstrated that positive changes generally increased with the passage of time and negative changes decreased over the period of time, however, changes in different domains of PTG and

PTShad followed diverse courses and there is a noteworthy individual variation in patterns of change. Frazier, Conlon, and Glaser (2001) investigated the pattern of positive changes and found that facets of PTG such as life appreciation, sense of personal strength, identification of new possibilities, relationship with others, and spirituality increased over the period of time. In another study, where data was taken at two time points among the U.S. Military Veterans sample, five different courses of PTG were seen (i.e., consistently low, moderately declining, increasing, dramatically declining, and consistently high). Almost 50 percent of the veterans who had reported at least "moderate" growth maintained that PTG level even after two years later (Luszczynska et al., 2012; Tsai, Sippel, Mota, Southwick, & Pietrzak, 2016).

Greene, Lahav, Kanat-Maymon, and Solomon (2015) found that PTG and PTS remained stable over time. Schwarzer, Luszczynska, Boehmer, Taubert, and Knoll (2006) demonstrated that among the clinical patients positive changes increased over one year. Changes were noteworthy only for those participants who started off at a low level. Similarly, among the patients with spinal cord injuries, majority of the sample showed no signs or symptoms of depression. To see the trajectory of PTS, Pietrzak et al. (2013) depicted that there are heterogeneous trajectories of PTS and that these trajectories have common and novel determinants. Shalev (2007) showed that after exposure to a trauma, people typically would show transient symptoms resembling PTS. Only some individuals exposed to the severely traumatic event develop PTSD. However, most would recover depending on the severity of the trauma and Monk, Oseland, Nelson, Ogolsky, and Summers (2017) depicted that the passage of time was the significant corollary to PTG when moderated by a PTSD diagnosis. Laaser, Putney, Bundick, Delmonico, and Griffin (2017) demonstrated that

participants reported a reduction in trauma symptoms, but only persons who had social support experienced a significant increase in PTG from pretest to posttest.

Majority of the past researches that reported an increase in trauma symptoms with the passage of time are based on veteran samples. Pietrzak, Van Ness, Fried, Galea, and Norris (2013) led the study with the goals to find out the determinants of longitudinal trajectories of disaster related PTS among the individuals affected by a large-magnitude disaster. Latent growth mixture modelling was used to identify the trajectories of disaster related posttraumatic stress over time. Almost 78.7 per cent of the sample having low/no PTSS on over all assessments; 16.0 per cent having elevated symptoms and 5.3 per cent having a delayed onset course of PTS symptoms.

Past empirical research based on diverse trauma samples have demonstrated that trauma symptoms decrease with the passage of time (Van Griensven et al., 2006). Vloet et al. (2014) demonstrated that the rate of PTS declined from approximately 59 % to 11 % between the first assessment and the follow-up. Similarly, Baker, Kelly, Calhoun, Cann, and Tedeschi (2008) suggested that individuals, who had experienced significant stressors, had reported depreciation afterwards. Moreover, both the depreciation in PTG and depreciation in PTS and distress symptoms do occur simultaneously (Park & Lechner, 2006; Tedeschi & Calhoun, 1996; Tomich & Helgeson, 2004). In another longitudinal study, features of PTS for survivors of motor vehicle accidents were investigated at 1 week, 1 month, 3 months, and 6 months after the traumatic event by using self-report measures. Results demonstrated that survivors with significant stress one week after the accident had a higher risk for developing chronic PTS. Although the severity of hyper arousal and intrusive symptoms diminished across time, however, the severity of avoidance symptoms

stayed unchanged (Wu & Cheung, 2006). However, coping strategies remained relatively stable over time (Pollard & Kennedy, 2007).

PTG theorist, R.G. Tedeschi, (personal communication, February 5, 2013) believed that one can expect to see PTG in the initial six months in many persons. However, there is an increase in growth early on and leveling off within 12-24 months. Of course, there are individual variations. Other PTG researchers proposed that patients reported PTG after 3 months of traumatic experience, but also, after 6 months or even 1 year after the traumatic experience. After the diminished of PTS symptoms, increases the deliberate rumination and, therefore, increases the PTG values, even if the perception of PTG has emerged 3 months after the trauma (C. Ramos, personal communication, August 5, 2013). Powell, Gilson, and Collin (2012) stated that PTG is a relatively stable phenomenon once established after the early years. In another longitudinal study, female patients were assessed for PTG four times within 8 months of diagnosis and then after 6, 12, and 18 months. Overall, six trajectory groups appeared (Three with stable PTG, two with increased PTG, and one with substantial increase of PTG over time. However, trajectory groups differed by social support, coping, and other demographics (Danhauer, 2015). Tartaro et al. (2005) showed that women who had reported PTG in their breast cancer experienced high levels of distress pre-diagnostically, it declined over time. Few others suggested that PTG is relatively stable over the first 6 months after diagnosis of the illness and changes as a result of a diagnosis or PTG appears to increase over the weeks following diagnosis and then gradually decline (Moore et al., 2011). However, it is still unclear to what extent PTS triggers PTG over time?

Rationale of the Present Study

Trauma has become a dominant topic in the discussions of contemporary world (Fassin & Rechtman, 2009). Literature on mental health sequel from community samples following natural disasters is scant especially from developing countries (Kar & Bastia, 2006). Besides, studies about the correlates and functional significance of growth in community samples is even more limited (Tsai, El-Gabalawy, Sledge, Southwick, & Pietrzak, 2015). The continuing dominance of flood events at a worldwide level escalates the research rationale for studying flood related health impacts, so as to gauge both long term health consequences and estimate perceived positive outcomes for flood affected individuals and communities (Bich et al., 2011; Joseph, Proverbs, Lamond, & Wassell, 2011; Kirsch et al., 2012). The field of psychological trauma is changing as researchers have identified that adversity does not always lead to dysfunctional life, rather an individual does experience positive life changes too. Voluminous literature demonstrates that trauma survivor often experience negative outcomes including serious challenges to assumptive world, disruptions in relationships, and posttraumatic stress etc. However, the adversity can likewise evoke new coping skills, a sense of personal strength, more specifically PTG.

There is scarcity of researches that inspect the variables that are related to and/or influence the processes and outcome of PTG after a natural disaster (Meyerson et al., 2011). In fact, until very recently there is not sufficient published and unpublished research material on longitudinal correlates of PTG (Aspinwall & MacNamara, 2005; Milam, 2004; Wang, Chang, Chen, Chen, & Hsu, 2014). Moreover, the longitudinal course of PTG is poorly understood while, among the existing research a majority of available literature had cross-sectional designs

(Zoellner & Maercker, 2006). The cross-sectional designs are incapable to identify the causal association between predictor and outcome variable, making it hard to illustrate the nature of relationships. Therefore, owing to cross-sectional designs, these researches portray weak evidence of a causal association between trauma and growth. In addition, studies that have measured the PTS-PTG relationship are limited because of minimal number of assessment points and by the delay between the assessments after trauma incident (Kilmer & Gil-Rivas, 2010).

Trauma theorists proposed that future studies may address these limitations by deploying longitudinal design with high-stress populace, such research would benefit from inspecting the relationship between the PTS, cognitive processes, and subjective and objective trauma in more detail and examine the moderating role of both subjective and objective trauma separately as well as combined (Salsman, Segerstrom, Brechting, Carlson, & Andrykowski, 2009; Shand et al., 2015). PTG theorists also stress on the prospective research that collects data on PTG at several time points across development and see how these responses changes over time and what mechanisms might explain the PTS and PTG associations. It is well established that PTS and PTG can coexist, however, cognitive pathways to PTS and PTG can be different.

Most of the research in the area of growth conducted in western countries and limited studies have conducted in these areas. This preliminary study offers a novel examination of PTG and its cognitive and psychosocial correlates among flood affected individuals in Pakistan. Consistent with the need to achieve a better understanding in the area of PTG, the current study will address gaps in literature by understanding both the cross sectional longitudinal relationship between growth and

PTS. In the baseline assessment, we would examine whether PTG after flood exposure is related to cognitive processing and distress? Whether time since exposure, age, gender, and education moderate the relationships between these variables? At T2 and T3 longitudinal path analysis may be supportive in revealing the causal relations among traumatic events, both types of ruminations, and PTG and see how these factors impact the association between PTS and PTG. It would help in understanding the stability or change of PTG over time as the relationship between PTG and traditional distress outcomes as previously these remained unclear (Occhipinti, Chambers, Lepore, Aitken, & Dunn, 2015). The longitudinal study would be effective in finding the causal association among stressful incident, ruminations, and PTG and to examine how psychosocial (social support, wellbeing, and life satisfaction) and environmental (trauma severity) factors influence the relationship between PTS and PTG.

This study extends the past PTG work, upgrades understanding of PTG, and expands its nomological network by investigating associations beyond those between trauma-related variables and growth. It would enhance our understanding that to what extent PTS triggers PTG over time? Moreover, the study would undertake the pattern of change in trauma and distress responses and rumination patterns over time. Understanding about factors that were related to growth among survivors of flood may add our knowledge on PTG that may help to develop strategies to promote PTG. To identify factors fostering PTG is very important in order to promote PTG (Romeo et al., 2017). Hence, this research would help in further delineating the nature of cognitive processing and understand the trajectory of PTG over time. So longitudinal framework of research enable us to see how psychosocial factors affect the

relation between PTS and PTG both cross-sectionally and over the passage of time. For the first time point of study (cross sectional data) following model is aimed to be tested.

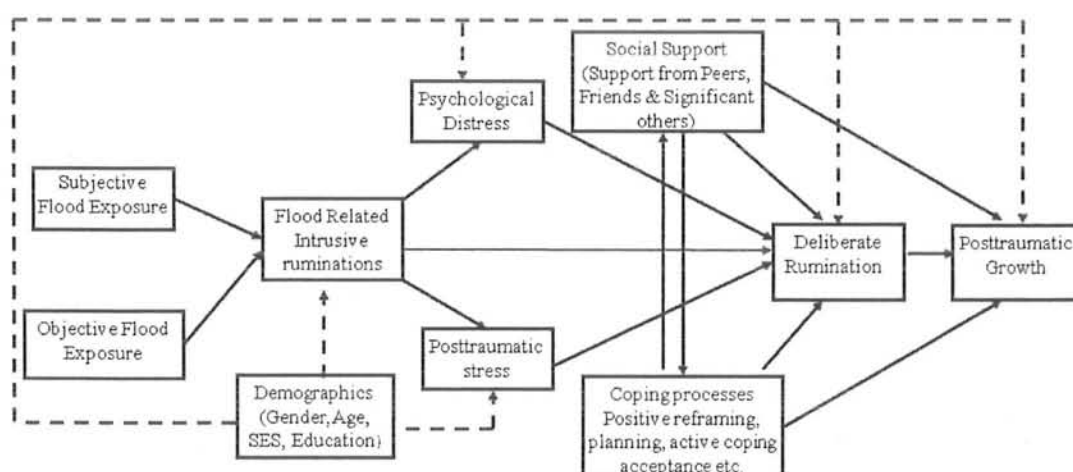


Figure 1. Proposed model for the first time point of the study

PTG model has been proposed by Tedeschi and Calhoun (1995, 2005), who suggested that PTG is elicited by stressful incident that challenges the individual's fundamental beliefs. In turn, subjective appraisal to threat enhances schema reconstruction. It enhances a sense of meaning and value in one's life. As indicated by Tedeschi and Calhoun, this reconfiguration require distress as well as intrusive rumination, which keep up distress and prompts deliberate rumination including coping efforts. The deliberate rumination tries to reconcile the trauma with one's representational world in order to meaning making and involve narrative development (Calhoun & Tedeschi, 2006); while, social factors may influence the whole process. For instance, social support offered by friends, family, and significant others may provide frameworks to understand the traumatic experience for emergence of growth. Moreover, demographic variables such as age, gender, education, and SES may influence the relationship between stressful event and growth.

Findings from this study would advance knowledge and facilitate understanding in terms that trauma and growth could be understood in an integrative psychosocial framework and help in devising an integrative perspective for understanding these post trauma experiences in the same framework of human experience. As depicted in literature review, most of the work has been conducted with the cancer patients and very little work has been done with disaster ridden populations. This study propels the research on PTG in two ways. First, identification of psychosocial correlates of growth in flood exposed individuals has important theoretical implications that would provide guidance for devising interventions that may promote growth following a natural disaster. Second, the use of a longitudinal study design permitsto draw much stronger inferences regarding factors that may influence the occurrence of PTG in flood affected population and understand the dynamics of cognitive and social factors and PTG. This study will be beneficial for clinicians to have a better understanding of mechanisms of PTG that ultimately would be helpful in mitigating the adverse effects of trauma and better able to comprehend the positive legacy of trauma that has a functional significance as well (Tsai, El-Gabalawy, Sledge, Southwick, & Pietrzak, 2015).

RESEARCH DESIGN

Overview of the Present Study

The purpose of the present study was to see the contributing factors and psychosocial correlates of posttraumatic growth among individuals who have been exposed to flood 2010 in Pakistan. Moreover, it aimed to examine the trajectory of PTS, distress responses, rumination patterns and PTG over time. Self-report measures were used for data collection. After the selection and translations of the instruments, the pilot testing was conducted. The aim of the pilot study was to see the psychometric properties of translated versions of instruments and trends and directions of relationships among the study variables. Then the main study was conducted. To see the trajectory of study variables over time, the longitudinal study was planned and the data was collected at three discrete time points, (i.e., T1 [Time 1], T2 and T3) with six months apart (equally spaced time intervals). For the first time point of the study [T1], data of 2000 individuals was taken from the three flood affected regions and more precisely, six flood affected areas of Pakistan, to be specific: Neelum Valley, Azad Kashmir; Dera Ghazi Khan, Mianwali, and Muzafargarh from Punjab; Nowshera and Peshawar from Khyber Pukhtunkhwa (See Figure 2, for geographical areas from where the sample was taken).

The data for second ($N=239$) and third time point ($N=153$) of the study was taken from district Mianwali (Punjab) (See Figure 3). Purposive and convenient sampling technique was used for the data collection. T1 data was collected during January 2013; T2 was collected in July 2013 and the T3 data was collected in February, 2014. Detailed description, nature and intensity of damages due to flood in the above mentioned areas had been described in introduction chapter under heading 'Pakistan Flood 2010'. These areas have been almost equally affected during the floods 2010 (OCHA, 2010).

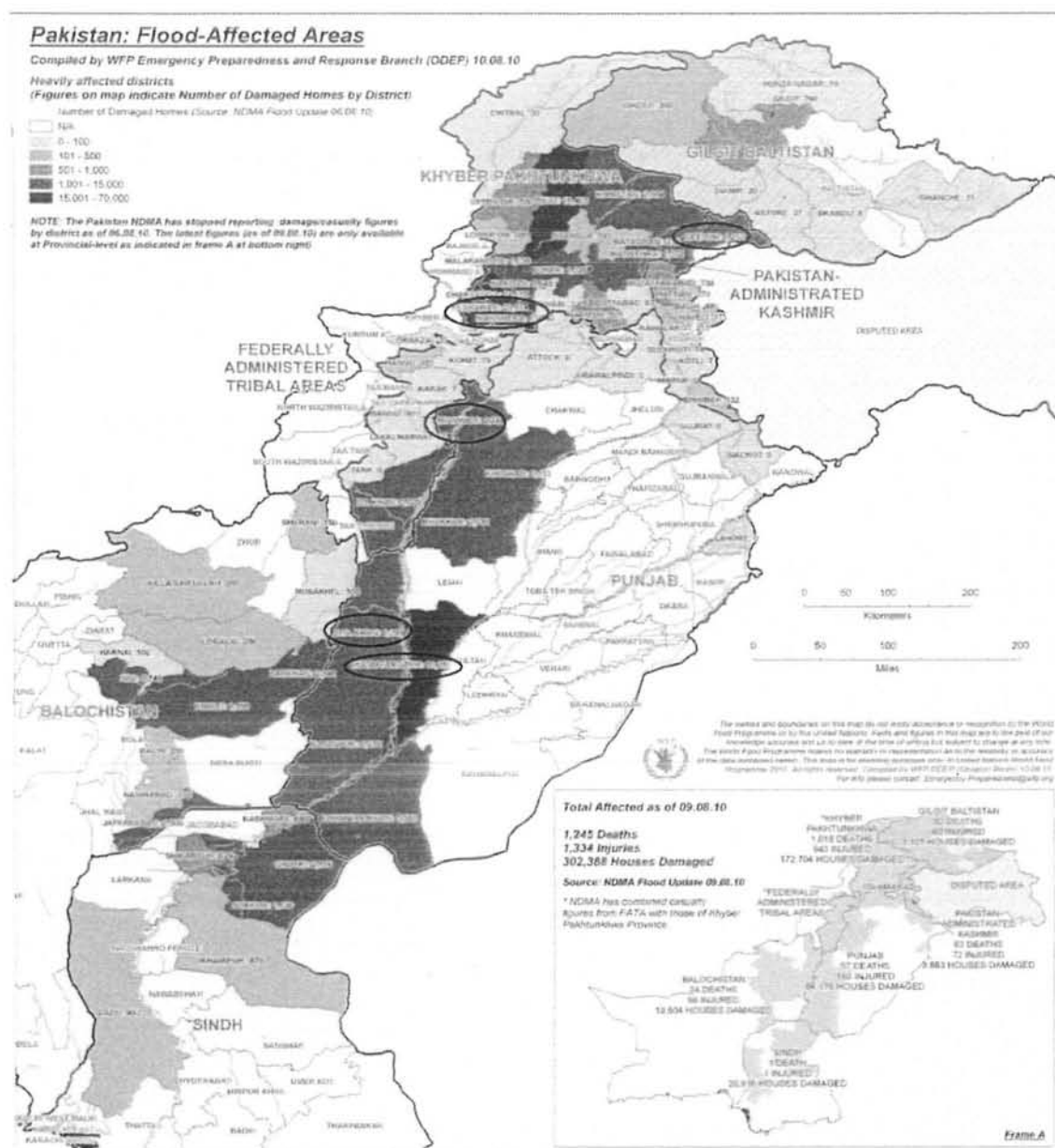


Figure 2. Map of the Pakistan: Flood -Affected Areas.

Selection, Translation and Adaptation of Instruments

In order to measure the study variables relevant instruments were selected. Permission of the authors was taken for using or modifying of the instruments. Flood Related Exposure Scale (FRES) was devised to see the subjective and objective exposure to flood that was similar in content that was of Hurricane Related Exposure

Scale (Goenjian et al., 2001). Depression Anxiety and Stress Scale (Lovibond & Lovibond, 1995) that was already translated in *Urdu* (Aslam, 2007) was used to measure the depression, anxiety, and stress. The Impact of Event Scale (Horowitz et al., 1979) that was already translated in *Urdu* (Aslam, 2007) was used to measure the posttraumatic stress. In the instructions of the scale, the word “after experiencing flood” was added instead “after experiencing any unpleasant event”. To measure the intrusive and deliberate ruminations, Event Related Rumination Inventory (ERRI; Cann et al., 2011) was used. The inventory was translated into *Urdu* and the instructions were modified in the context of flood. The Short form of Posttraumatic Growth (PTG-SF; Cann et al., 2010) was also translated in *Urdu*. The translation of the scales was done according to the procedure suggested by Brislin (1976). However, the rest of the scales that were already translated in *Urdu*, such as Well-Being Questionnaire (W-BQ12; Bradley, 2001) translated in to *Urdu* by Kashif (2012); Multi Dimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet & Farley, 1988) translated in to *Urdu* by Shahid (2010); Satisfaction with life Scale (Diener et al., 1985) translated in to *Urdu* by Akhtar (2005); and Brief COPE (Carver, 1997) translated in to *Urdu* by Zahid (2002) were used as it is. Demographic sheet was designed that included both the open ended and close ended questions (detail description of the all the scales are given in Chapter 3, under the heading of instruments).

Pilot Study

After the selection, translation and adaptation of the instruments along with the finalization of the demographic sheet, the next step was to try these instruments on target population. The objectives of the pilot study were to see the psychometrics of

the scales and the suitability of the translated instruments on target sample and to check the trend of relationship among variables. Informed consent was taken from the participants before data collection. A sample of 101 flood affected individuals was taken from district Shahdadkot Sindh. The details and results with discussion of the pilot study are described in Chapter 3.

First Time Point [T1] of the Study

The broad objectives of the T1 of the study were to understand trauma and growth in an integrative psychosocial frame work. Moreover, the study had undertaken to see the psychosocial correlates of PTG and PTS, and identify the mediating role of PTS, distress responses, ruminations patterns, coping strategies, social support and moderating role of gender, age, education in the relationship between trauma exposure and PTG.

A sample of 2000 individuals was taken from different flood-affected areas (Khyber Pukhtunkhwa, Punjab, and AJK) of Pakistan. It included genders, men and women ($n = 1402$, 70 %, and $n = 598$, 29 %) respectively (detailed description of sample for the T1 study has been given in Table 5 & 6 and in Figure 3). The T1 of the study was conducted by using a cross-sectional, correlational design.

A detailed description of the T1 of the study has been given in a separate Chapter 4, along with the results and discussion.

Second Time Point [T2] of the Study

The objectives of the T2 of the study was to see the patterns of changes in the study variables such as PTS, distress responses, rumination patterns, coping strategies,

and PTG over T1 to T2, among individuals exposed to 2010 floods in district Mianwali, Punjab.

For T2, among the six districts from where we have taken the T1 data, we selected the Mianwali district from Punjab for T2. At this district 327 individuals participated at T1 of the study, 239 participated at T2 and 88 (26.91 %) individuals could not be located. For the sample of T2 data, this area was selected conveniently. In this area there was almost equal participation of both the gender (i.e., 115 [48.12 %] men and 124 [51.88 %] women). A complete description of the T2 of the study has been given in Chapter 5, along with the results and discussion.

Third Time Point [T3] of the Study

The objectives of the T3 of the study was to explore the trajectory of PTS, distress responses, rumination patterns, coping strategies and PTG over three time points (i.e., T1, T2, and T3).

For the T3, sample comprised of 153 individuals, 90 (58.85 %) women and 63 (41.18 %) men. However, 86 (35.98%) individuals could not be located from T2 data. A complete description of the T3 of the study is given in a separate Chapter 6 along with the results and discussion.

In the general discussion, the findings of the study are illustrated and explained in the light of past literature and in the broader context of PTG theory. Moreover, the significance of the understanding the trauma and growth in an integrative psychosocial framework is discussed. At the end, research limitations, implications, and recommendations for the future study are discussed.

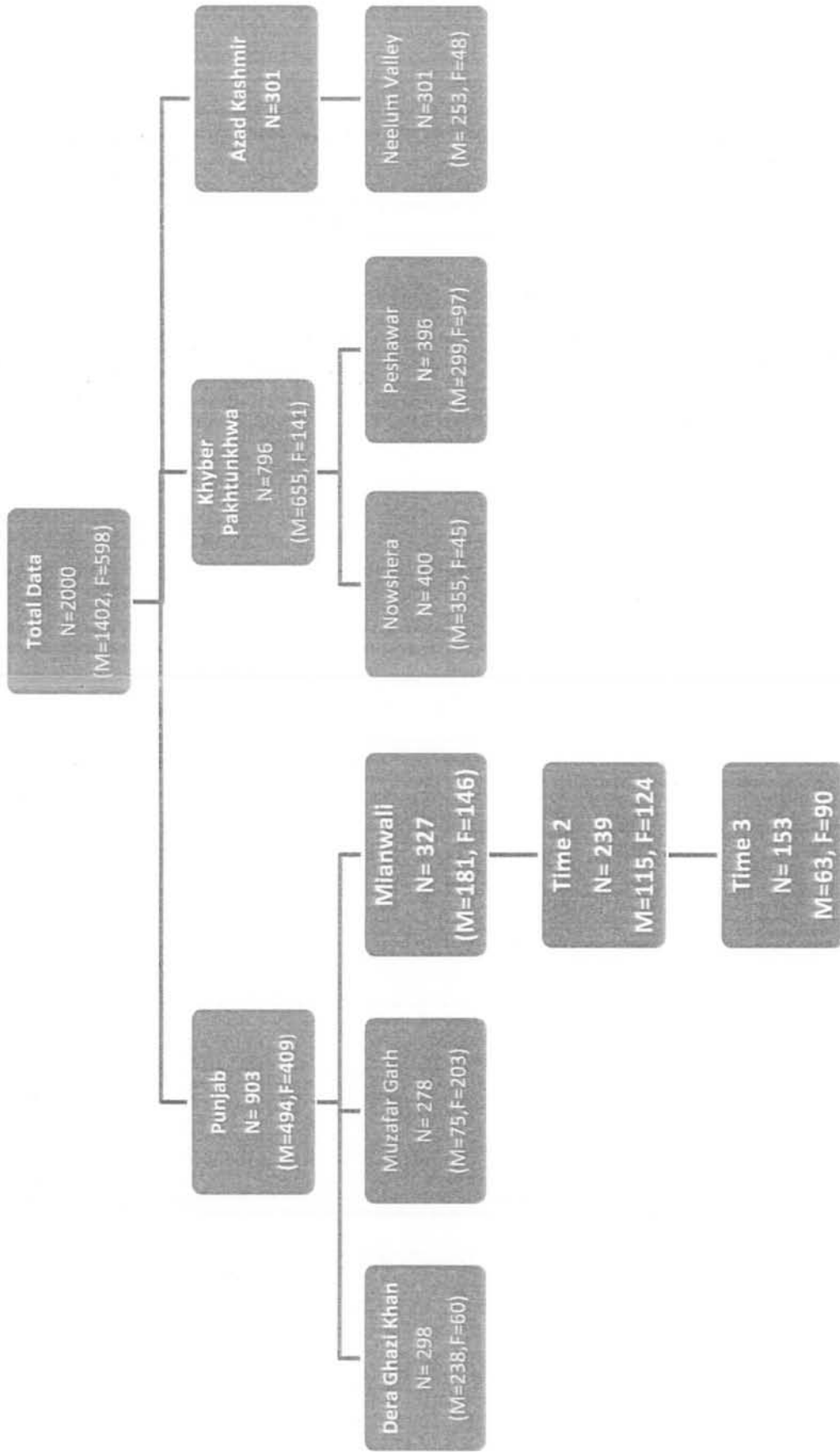


Figure 3. Description of the study sample

TRANSLATION OF THE SCALES AND PILOT TESTING

Translation of the scales and pilot testing was done in two phases. Phase I is concerned with the translation of the Event Related Rumination Inventory (ERRI; Cann et al., 2011) and Posttraumatic Growth Inventory (PTGI-SF; Cann et al., 2010). Phase II comprises of pilot testing of all instruments utilized as a part of the study alongside the already *Urdu* version of instruments that are part of research. The validation of all the instruments was done before hypotheses testing. First we are giving the overall descriptions of the scales used in the study.

Phase I: Procedure for Translation of Scales

The translations of the measures were done in four steps. It included the forward and back translation, committee approach, and cross language validation. In addition, the instruments were judged on the basis of criteria of culture and sample appropriateness, construct clarity, gender-specific biasness and language comprehension. To meet the objectives of phase 1 following steps were taken. A detailed description of the translation and selection of the scale is given below.

Translation of the Measures. The translation of the Event Related Rumination Inventory and Posttraumatic Growth Inventory was carried out by using the guideline suggested by Brislin (1976). As per these guidelines for translation one should consider few principles that include maximization of content similarity between original test and the target language version, not to substitute or eliminate any item, and keep the language of the original test relatively simple. Translation of

the scales was completed in the four steps. First of all, English version of the both scales (ERRI and PTGI-SF) along with instructions to translate were given to four translators (three MPhil psychology, one Clinical psychology diploma holder) who were bilingual (able to speak and write both *Urdu* and English languages). They were asked to translate all items into *Urdu* language along with the instructions that were provided for each scale. At second step, the best *Urdu* translation was selected by the committee of four judges having 18 years of education in psychology. These translated items were again given to four different bilingual experts, having minimum education of 18 years in psychology, for back translations. Finally, to check whether the original measures were adequately translated, committee reviewed the back translation. Like previous committee approach, every statement was discussed by the experts in another committee approach and commonly settled upon version was chosen. The back translation was found to be quite satisfactory for all the items.

PHASE 11: PILOT TESTING OF THE SCALES

Objectives

Pilot study was conducted in order to examine the psychometric properties of the instruments used in the study and to confirm the reliability estimates of measures for Pakistani culture (culture appropriateness of the scales). For this purpose, reliability estimates of the measures were computed and the internal consistency of the scales was examined. It also aimed to check the trends of data and the direction of relationship of variables.

Sample

Sample for pilot was 101 individuals who had experienced 2010 flood in district Qambar Shahdadkot Sindh, Pakistan. According to report of OCHA (15 September, 2010), in Shahdadkot, from the total population of 1,221,283, the affected population was 980,500. Approximately, 550 out of 750 villages in this district were affected fully or partially. The age range of the participants was between 16 to 64 years ($M = 27.6$, $SD = 7.61$). The sample included both the male and female participants. The education of the participants was ranged from 10 to 16 years of education. Almost 87 % of the participants have some sort of property loss during the flood. The participants were chosen through purposive and convenient sample technique. Those individuals were included as a participant of the study who had experienced the flood and has the ability to read and write and can comprehend the questionnaires. Participants with any diagnosed psychiatric illness were excluded from the sample.

Table 1*Demographic details of the Sample of the Pilot Study (N=101)*

Demographics	<i>f</i>	%
Gender		
Male	85	85
Female	16	16
Marital Status		
Single	43	43
Married	54	55
Missing	04	
Education		
Masters	43	43
Bachelors	47	46
Intermediate	07	7
Matriculation	04	4
Employment Status		
Employed	45	45
Unemployed	54	54
Missing	02	1

Table 1 demonstrates descriptive statistics of demographic characteristics of the sample of the pilot study. Sample of the men was higher than that of the females. In addition, there was almost equal number of married and unmarried participants. Higher number of the participants had the bachelors' level education.

Instruments

The following measures have been used to accumulate data for the present research. The detail description of each scale is given below.

Flood-Related Exposure Scale. Nature of flood appraisal and level of exposure to flood was measured by using Flood-Related Exposure Scale (FRES). This

scale was devised to measure the extent of exposure of the respondent to flood. It is 11-items likert type scale that is almost parallels in content of the Hurricane Related Exposure Scale (Goenjian et al., 2001). The measure comprises two components: Flood Exposure Subjective (FES) assesses the subjective appraisal to flood (including items such as: “were you scared that you would die?”) and Flood Exposure Objective (FEO) assesses the objective appraisal to Flood (including items such as: “did you see anybody trapped in flood”). This scale was translated and modified according to the context of flood (Appendix Aii). Seven items measure the subjective appraisal to flood while four items measures the objective appraisals. All items are positively scored and score ranged from ‘*A little*’ (0) to ‘*A lot*’ (4). Minimum score on this scale is 0 while maximum score is 44. Higher the score on the scale would indicate the higher level of subjective and/or objective appraisal to flood and vice versa. The alpha reliability of the original scale is .81 (Goenjian et al., 2001).

Depression, Anxiety, Stress Scale (DASS). Psychological distress was measured by using Depression Anxiety Stress Scale. This is a 21-item self-report scale developed by Lovibond and Lovibond (1995). DASS has been a widely used instrument in diverse settings. The *Urdu* translated version (Aslam, 2007) was used in the present study (See Appendix B). DASS-21 has three subscales, each subscale contains 7 items. The Depression Scale measures sad mood, disenchantment, lack of interest, devaluation of life, lack of involvement in daily activities, and lack of energy. The Anxiety Scale measures the situational uneasiness, arousal, muscular strains, and anxious mood. The Stress Scale evaluates trouble in relaxing, irritability, nervous arousal, agitation, impatience, and being touchy. It is 4-point rating scale with

response options “0 (*Did not apply to me at all*) to 3 (*Applies to me most of the Time*)”. High score on each subscale would indicate higher the level of depression, anxiety or stress. Summation also provides a total distress score. For the each subscales, there are also specific cut-off scores that ranges from mild to extremely severe. The alpha values for the subscales are .84, .82, and .87 for Depression, Anxiety, and Stress, respectively (Lovibond & Lovibond, 1995). The alpha values of the *Urdu* translated scale are .82, .81 and .76 for Depression, Anxiety, and Stress respectively (Aslam, 2007).

Impact of Event Scale (IES). PTS was measured by using Impact of Event Scale. This scale was developed by (Horowitz et al., 1979) and translated in *Urdu* by Aslam (2007) (See Appendix C). The scale measures the current subjective trauma related symptoms to any life event that occurred during the past. The IES scale comprises of 15 items. Intrusive symptoms are measured by seven items. Summation provides a total PTS Score. IES is 4-point rating scale. The response items on this scale are ranging from “not at all” to “often”. Respondents have to report how frequently they had experienced the situation on each item. Minimum score on this scale is 0 while maximum score is 75. All items are positively scored. The alpha reliability of IES is .80. Cronbach’s alpha for the scale is ranged from .73 to .90. To be more specific, for the intrusion subscale it is .78 to .91 and for the avoidance subscale it ranges from .69 to .91 (Horowitz et al., 1979). The alpha reliability of the *Urdu* version scale is .82 (Aslam, 2007). The IES is most likely the most broadly utilized scale for estimating cognitive and behavioural conditions after traumatic

circumstances, such as natural disasters (Schwarzwald, Solomon, Weisenberg, & Mikulincer, 1987).

Event Related Rumination Inventory (ERRI). ERRI is designed to assess the two styles of rumination (Intrusive and Deliberate rumination). It is a 20-item measure devised by (Cann et al., 2011). Respondents have to rate the degree to which they have experienced certain thoughts on a 4-point likert scale (0 = “not at all;” 3 = “often”). 10 items tap the intrusive rumination. It incorporates the items such as, “I could not keep images or thoughts about the event from entering my mind”. The alpha reliability of this subscale is .87 (Cann et al., 2011). The scale was translated in to *Urdu*. Before administration of the scale with flood affected individuals, the participants were given the instructions (See Appendix Di). Moreover, the subscale Deliberate Rumination had the 10 item. It incorporates the items such as “I forced myself to think about my feelings about my experience”. The alpha reliability of the subscale is .89 (Cann et al., 2011). Before administering this scale the respondents were given the accompanying guidelines. (See Appendix Dii)

Well-Being Questionnaire (W-BQ12). To measure the psychological wellbeing, 12- item Well-Being Questionnaire (W-BQ12) developed by Mitchell and Bradley (2001) and translated in *Urdu* by (Kashif, 2012) was used. It has 4-item three subscales, including Positive Well-Being (PWB), Negative Well-Being (NWB), and Energy wellbeing (ENE), and the 12-item overall scale General Well-Being (GWB). The alpha reliability of the negative wellbeing is .89, for positive wellbeing .82, and .74 for the energy wellbeing (Malik & Koot, 2009). Items 9, 10, 11, and 12 are

summed to get a total Positive Well-being score. Items 1, 2, 3, and 4 are summed to produce a total Negative Well-being score. Items 6 and 7 are reversed and then summed together with items 5 and 8 to produce the total energy score. The negative well-being score is reversed and then summed with energy score and positive well-being scales to produce the General well-being Score, that is ranged from 0 to 36. The higher the score on the scale, the greater would be the sense of General Well-being (See Appendix E).

Multi Dimensional Scale of Perceived Social Support. MSPSS has been originally developed by Zimet et al. (1988) and is translated in *Urdu* by Shahid (2010). In the present study, *Urdu* translated version of MSPSS was used (See Appendix F). It is easy to use and time-saving instrument with the responses given as a 7 point scale from 1 signifying “Very Strongly Disagree” to 7 signifying “Very Strongly Agree”. This scale has 12-item self-reported statements that measures perceived means of support from three different sources: significant other support (item 1, 2, 5, 10); family support (items 3, 4, 8, 11); and friends support (items 6, 7, 9, 12). The alpha coefficient for the *Urdu* translated scale is .85. The maximum score on each subscale is 28 and minimum score on each subscale is 4. Separate scoring on each subscale can be obtained as well the summation gives the total score. Higher the score on each subscale would indicate the presence of higher social support from that specific source and the other way around.

Short Form of the Posttraumatic Growth Inventory (PTGI-SF). A short form of the Posttraumatic Growth Inventory (PTGI-SF) developed by Cann et al.

(2010) and translated in *Urdu* by Aslam (2013) was used to measure personal growth in the following domains: realizing the new possibilities in life, associating with others, perception of an increased individual strength, appreciation of life, and a deep sense of being. Participants rated themselves to a degree of change they had experienced after a stressful event on a likert scale ranging from 0 to 5. Including items such as, "I established a new path for my life") (See Appendix G). The higher the scores on this scale would indicate the higher PTG. The PTGI is a frequently used self-report measure and satisfactory reliability, replicable factor structure and support for concurrent validity (Kaler, Erbes, Tedeschi, Arbisi, & Polusny, 2011). Satisfactory construct validity was supported by the correlation analysis between the PTGI and the IES (Mystakidou, Tsilika, Parpa, Galanos & Vlahos, 2008). Moreover, PTGI-SF is considered as an appropriate scale to assess the posttraumatic growth (Shakespeare-Finch & Enders, 2008).

Satisfaction with Life Scale (SWLS). The Satisfaction with Life Scale, developed by Diener et al. (1985) and translated in *Urdu* by Zahid (2002) was used to measure the life satisfaction (See Appendix H). It designed to measure global life satisfaction. It has five items and participants rated on a 7-point likert scale ranging from "1 strongly disagrees - 7 strongly agree". SWL has satisfactory reliability ($\alpha = .78$) and has high temporal reliability and high internal consistency. This scale showed moderate to high level of correlation with other subjective well-being scales (Diener et al., 1985).

Brief Cope. Brief Cope was used to assess the coping strategies utilized by the participants. This scale was originally developed by the Carver (1997) based on a community sample that had been affected by a hurricane. The *Urdu* translated version (Akhtar, 2005) of this scale was used in present study (See Appendix i). It is a self-report measure to assess the coping strategies. It has 14 subscales and 28 questions for which psychometric properties are described. The scale has no reverse items. The alpha reliability of scale is .84. Participants rated on a 4-point Likert scale with the response options ranging from 1 ("I haven't been doing this at all") to 4 ("I've been doing this a lot") to see the degree to which they use each coping strategy. Carver (1997) reported the subscales with alpha reliabilities including: active coping ($\alpha=.68$), self-distraction ($\alpha=.71$), positive reframing ($\alpha=.64$), using emotional support ($\alpha=.71$), planning ($\alpha=.73$), acceptance ($\alpha=.57$), turning to religion ($\alpha=.82$), humour ($\alpha=.73$), using instrumental support ($\alpha=.64$), denial ($\alpha=.54$), substance use ($\alpha=.90$), venting ($\alpha=.50$), self-blame ($\alpha=.69$), and behavioural disengagement ($\alpha=.65$). Brief Cope is widely used instrument for assessing the coping strategies. The alpha reliability of the *Urdu* translated version of the scale is .87 (Akhtar, 2005).

Procedure

Before data collection, informed consent from the participants was taken. Participants were explained the nature and purpose of the study. All the participants first filled the demographic questionnaire that was consisted of items asking participants to report their name, address, contact numbers, gender, socioeconomic status, work status, number of family members, academic class, marital status, employment status, nature of damages, any physical or psychological illness, losses

during the flood, and any traumatic event they experienced after the flood that might have caused significant distress in their life. Moreover, they were given the assurance that the information they would provide, would kept confidential. Each participant him/herself filled the questionnaire. Data collection was taken place in community settings and it took approximately 30 minutes to complete the whole booklet. No compensation was given to participants. At the end, respondents were thanked for their participation in the study.

Results

Descriptive statistics and Alpha reliabilities of the scales were computed. In addition, bivariate correlation analysis between the predictors and outcome variables was computed by using Predictive Analytics Software (PASW) 18. Furthermore, Independent sample *t*-test was computed to see the mean differences.

Table 2*Descriptive Statistics and Alpha Reliability of the Scales used in the Pilot Study (N=101)*

Scales	Item	M	SD	α	Range		Skew
					Potential	Actual	
Flood Related Exposure Scale	11	15.09	9.57	.83	0-44	0-34	.56
Objective Exposure (OE)	7	10.10	6.18	.81	0-28	0-22	.86
Subjective Exposure(SE)	4	6.30	4.31	.82	0-16	0-12	.63
Depression Anxiety Stress Scale	21	34.19	7.17	.89	0-63	21-58	1.45
Subscale Stress	7	11.55	3.12	.87	0-21	0-21	1.10
Subscale Anxiety	7	11.03	2.52	.86	0-21	0-17	1.01
Subscale Depression	7	10.80	2.10	.84	0-21	0-15	.42
Impact of event scale (IES)	15	32.95	19.92	.88	0-75	0-65	.24
Subscale Intrusive	7	19.84	6.82	.85	0-35	7-33	.36
Subscale Avoidance	8	21.20	7.73	.84	0-40	10-40	.62
Intrusive Rumination	10	14.26	7.24	.89	0-30	0-30	.13
Deliberate Rumination	10	17.44	6.99	.85	0-30	1-30	-.09
Posttraumatic Growth Inventory	10	30.56	7.48	.88	0-50	4-47	-.27
Relating to others	2	6.20	1.87	.72	0-10	2-10	-.16
New possibilities	2	6.44	1.99	.51	0-10	2-10	-.16
Personal strength	2	6.61	1.99	.82	0-10	2-10	-.19
Spiritual Change	2	6.72	2.03	.57	0-10	2-10	-.12
Life Appreciation	2	6.32	2.13	.53	0-10	2-10	-.26
Multidimensional Scale of Perceived Social Support	12	57.04	13.56	.89	12-84	16-82	-.46
Family support	4	18.14	5.92	.82	4-28	4-28	-.58
Friend support	4	19.29	5.84	.81	4-28	4-27	-.43
Significant other support	4	18.15	4.46	.82	4-28	4-28	-.29
Satisfaction with Life Scale	7	20.55	5.76	.83	5-35	5-33	-.49
Brief COPE	28	68.53	11.12	.82	28-112	32-107	-.44
Psychological Wellbeing Scale	12	24.44	4.26	.81	0-36	0-34	.24
Positive Wellbeing	4	6.96	3.01	.71	0-12	0-10	.57
Negative Wellbeing	4	4.10	2.93	.64	0-12	0-12	.35
Energy Wellbeing	4	5.01	2.17	.70	0-12	0-10	-.09

Results in the Table 2 demonstrate the alpha reliabilities of the scales. The Cronbach alpha values show that scales are reliable. The values are ranged from .52 to .93. To see the relationship between the study variables bivariate correlation was conducted. Results are presented in Table 3.

Table 3*Correlation between the predictors and outcome variables (N = 101)*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1 FES	-	.71**	.61**	.62**	.63**	.14	.15	.48**	.30**	-.11	-.22*	-.23*	.07	.05	.01	.05	.01	.15	.15	.45**	.05	.33**
2 FEO		-	.40**	.43**	.53**	.23	.08	.33*	.19	-.04	-.10	-.14	.22*	.11	-.01	.07	.09	.23*	.14	.25*	.10	.20
3 Stress			-	.77**	.79**	.26*	.34*	.59**	.44**	-.02	-.08	-.09	-.05	-.02	-.05	.08	.09	.08	.23*	.68**	.17*	.51**
4 Anxiety				-	.81**	.07	.03	.52**	.33**	-.02	-.08	-.03	-.10	.00	-.17	-.03	.10	.02	.34**	.72**	.04	.57**
5 Depression					-	.10	.16	.51**	.34**	-.06	-.01	-.13	-.23*	-.01	-.06	-.04	.14	.04	.28*	.66**	.11	.56**
6 PTS Intr.						-	.78**	.71**	.63**	.19	.29*	.08	.35**	.36**	.21	.55**	.61**	.07	.13	.19	.13	.06
7 PTS Avoid.							-	.72**	.56**	.10	.38	.11	.23	.33**	.28*	.35**	.56**	-.02	.02	.30*	.21	.14
8 Int. Rum								-	.67**	.14	.10	.07	.11	.15	.02	.31*	.17	.11	.28	.53**	-.02	.38**
9 Del. Rum									-	.30*	.20	.22*	.22*	.15	-.01	.34**	.32**	.25*	.25*	.35**	.09	.34**
10 Family Sup.										-	.66**	.84**	.15	-.08	-.07	.16	.03	.17	.17	-.04	.05	.10
11 Friend sup.											-	.68**	.30	.13	.25*	.38**	.33**	.21	.22**	-.13	.16	-.01
12 Sig. oth.sup.												-	.08	-.03	.01	.12	.03	.10	.19	-.07	.09	.07
13 Rel. other													-	.39**	.54**	.50**	.35**	.27*	.22*	-.07	.15	.06
14 New poss.														-	.54**	.54**	.57**	.21*	.14	-.16	.10	-.07
15 Per.Strength															-	.47**	.38*	.09	.13	-.22*	.16	-.14
16 Spirt.Change																-	.43*	.11	.31**	.02	.03	-.02
17 L.appreciation																	-	.35**	.28*	-.07	.31*	.19
18 L. satisfaction																		-	.02	-.16	.24	.13
19 Coping																			-	.34*	.06	.32*
20 N. Wellbeing																				-	-.35**	.03
21 P. wellbeing																					-	-.26**
22 E. Wellbeing																						-

Note. FES= Flood Exposure Subjective; FEO= Flood Exposure Objective; PTS Intr. = Posttraumatic Stress intrusive symptoms; PTS Avoid. = Posttraumatic stress avoidance symptoms; Intr. Rum= Intrusive Rumination; Del. Rum= Deliberate Rumination; Family sup. = Family support; friend Sup. = Friend support; Sig.oth.sup.= Significant others support; Rel.other = Relating to others; New poss.= New possibilities; Per. Strength=Personal strength; Spirt. Change= Spiritual change;L. appreciation= Life appreciation; L. satisfaction =Life satisfaction; N. wellbeing = Negative wellbeing; P. wellbeing; positive wellbeing; E. wellbeing = energy wellbeing

* $p < .05$, ** $p < .01$

Results in Table 3 showed that flood exposure subjective (FES) and flood exposure objective (FEO) both are significantly positively associated with the stress, anxiety, depression, PTS intrusive symptoms, intrusive rumination, deliberate rumination, negative wellbeing and energy wellbeing. While, FES is negatively associated with the friends and significant others support. Stress, anxiety, and depression are significantly positively associated with each other. Moreover, stress is significantly positively associated with PTS intrusive, PTS avoidance, intrusive rumination, deliberate rumination, coping and all three types of wellbeing. Anxiety is positively associated with the intrusive rumination, deliberate rumination, coping, negative and energy wellbeing. Depression is significantly positively associated with the intrusive rumination, deliberate rumination, negative wellbeing, energy wellbeing and negatively associated with the 'relating to others' a domain of PTG. PTS intrusive symptoms are significantly positively associated with the PTS avoidance symptoms, intrusive rumination, deliberate rumination, friends support (a domain of social support), relating others, spiritual change, new possibilities, and life appreciation. PTS avoidance symptoms are positively associated with the intrusive rumination, deliberate rumination, and four domains of PTG including personal strength, new possibilities, spiritual change, life appreciation, and negative wellbeing.

Intrusive rumination is positively associated with deliberate rumination, spiritual change, negative well-being and energy wellbeing. Deliberate rumination is positively associated with the Family support, significant others support, relating to others, spiritual change, life appreciation, coping, negative wellbeing and energy wellbeing. Family support is positively associated with the friends support and significant others support. Friend support is significantly positively associated with

the domains of PTG including personal strength, spiritual change, life appreciation and coping. In addition, subscale of PTGI (i.e., personal strength, relating others, spiritual change, new possibilities, and life appreciation) are positively associated with each other. Moreover, negative wellbeing is positively associated with energy wellbeing. These results are in the expected direction. There is non significant correlation between some variables. The possible reason could be the small sample size. However, the trend of the relationship is in expected direction.

Comparison between the Study Variables

To see the gender differences on the variables of nature of exposure to flood, psychological distress, posttraumatic stress, rumination patterns, social support, life satisfaction, coping, psychological wellbeing, and posttraumatic growth independent sample *t*-test was computed. Gender differences were seen to examine the pattern of comparison in both men and women.

Table 4

Gender Differences on the Variables of Posttraumatic Stress, Psychological distress, Rumination Patterns, Social Support, Psychological Wellbeing, Life Satisfaction, and Posttraumatic Growth (N=101)

Variables	Men (n=85)		Women (n=16)		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
FES	10.20	6.26	9.57	6.16	.34	.73	-
FEO	6.28	4.47	6.53	4.84	.20	.83	-
Psychological distress	32.34	4.68	45.31	9.48	5.33	.001	.66
Stress	7.79	3.52	11.50	2.80	3.59	.001	1.17
Anxiety	6.36	4.32	8.21	4.68	1.54	.12	-
Depression	7.13	4.47	8.78	3.62	1.55	.12	-
Posttraumatic Stress	29.74	13.58	51.29	16.33	5.31	.001	.58
PTS Intrusive	18.25	5.90	27.72	5.58	5.10	.001	.64
PTS Avoidance	18.94	6.66	30.26	4.36	5.57	.001	.71
Intrusive Rumination	12.87	6.21	21.26	8.24	4.66	.001	.50
Deliberate Rumination	16.68	6.70	21.27	7.37	2.45	.01	.31
Social Support	55.83	13.75	64.31	8.81	2.14	.03	.34
Family Support	17.69	5.64	20.71	6.97	1.78	.07	-
Friends support	18.69	4.38	22.84	3.18	3.27	.01	1.08
Signifi. Oth.support	17.91	5.52	19.47	4.84	.99	.32	-
Psychological wellbeing	24.50	4.27	24.14	4.33	.30	.76	-
Negative wellbeing	3.66	2.58	6.39	3.62	3.61	.001	.86
Energy wellbeing	4.82	2.10	6.04	2.04	2.10	.04	.59
Positive wellbeing	6.91	3.57	8.50	3.44	1.64	.10	-
Life Satisfaction	20.53	5.81	20.6	5.74	.82	.93	-
Coping	68.22	10.34	66.34	10.17	1.54	.12	.08
Posttraumatic Growth	29.72	7.12	35.41	7.74	2.82	.001	.36
Relating to others	6.12	1.73	6.60	2.53	.90	.37	-
New possibilities	6.22	1.96	7.60	1.76	2.52	.01	.74
Personal strength	6.46	1.83	7.40	2.44	1.72	.08	-
Spiritual change	6.35	1.96	8.73	1.16	4.54	.001	1.48
Life appreciation	6.06	2.13	7.67	1.54	2.77	.01	.87

Note. FES=Flood exposure subjective; FEO=Flood exposure objective; Signifi. Oth.support= Significant other support

Table 4 shows the difference of study variable between men and women. To see the difference on the nature of exposure to flood (i.e., flood exposure subjective and flood exposure objective), there was nonsignificant difference between two groups. Moreover, results showed that women scores significantly high on

psychological distress as compared to men. Psychological distress was measured by using the cumulative score of stress, anxiety, and depression. Moreover, women scored high on stress as compared to men. However, there was a nonsignificant difference on anxiety and depression. In addition, women scored significantly high on both posttraumatic stress intrusive and avoidance symptoms. To see the difference on rumination patterns, women scored significantly high on both intrusive and deliberate rumination. When the both groups were compared on social support, women scored significantly high on social support as well as on the family support. Negative and energy wellbeing was also significantly higher in women as compared to men. However, there was no significant difference on life satisfaction and coping between the two groups.

Women significantly scored high on the total score of posttraumatic growth. Moreover, on the subscales of PTG (i.e., new possibilities, spiritual change, and life appreciation) women scored high as compared to men. The findings are in accordance with the previous literature.

Discussion

The main aim of the pilot study was the pretesting of instruments and to see the direction and/or trend of relationship between the study variables. Moreover, it aimed to establish certainty on the translated instruments and culture appropriateness of the scales by examining the psychometric properties of *Urdu* translated version of instruments measuring flood exposure, psychological distress, posttraumatic stress, intrusive and deliberate rumination, perceived social support, coping strategies, life satisfaction and PTG. The second objective was to see whether the relationship between the study variables are in expected direction or not. In order to meet the study objectives, alpha coefficients were computed for all the instruments. The alpha coefficients are satisfactory for *Urdu* versions of DASS, IES, ERRI, WBQ-12, MSPSS, PTGI-SF, SWLS, and Brief Cope. The reliability of all subscales is in the acceptable range. The reliability values of the scale are ranged from .52 to .93 (See Table 2). Alpha reliability coefficients of the scales used in the study showed that we can confidently use these scales in the main study. For the pilot study, a sample of 101 individuals was taken from district Shahdadt, the area that was affected in floods 2010 in Pakistan.

To see the relationship between the nature of exposure to flood and other study variables, results showed that exposure to flood both (subjective and objective) were significantly positively associated with the stress, anxiety, depression, PTS intrusive, intrusive rumination, deliberate rumination, negative wellbeing and energy wellbeing. While subjective exposure to flood was negatively associated with the friends and significant others support. This pattern of findings is quite consistent with PTG theory and with previous PTG research (Butler et al., 2005; Hafstad et al., 2011; Levine et al., 2008). Moreover, to see the relationship between the subscales of DASS

results showed a significant positive association between stress, anxiety and depression. Moreover, stress was significantly positively associated with PTS intrusive, PTS avoidance, intrusive rumination, deliberate rumination, coping and all three types of wellbeing. Anxiety was positively associated with the intrusive rumination, deliberate rumination, coping, and with the negative and energy wellbeing. Similarly, depression was significantly positively associated with the intrusive rumination, deliberate rumination, negative wellbeing, energy wellbeing and negatively associated with the 'relating to others' a domain of PTG. The negative relationship between the subscales of PTG with depression is consistent with past literature (Kimhi et al., 2010). Findings are in line with the previous literature (Alisic et al., 2008; Barakat et al., 2006; Cadell, 2007; Calhoun, Cann, & Tedeschi, 2010; Currier et al., 2009; Gate et al., 2013; Wu et al., 2015; Xu & Liao, 2011; Yonemoto et al., 2012; Yu et al., 2010). These findings are supported by the past literature that suggests that intrusive rumination increases the incidence of stress, anxiety and depressive symptoms (Gate et al., 2013; Soo & Sherman, 2015).

To see the relationship between the posttraumatic stress and its subscales with the study variables, PTS intrusive symptoms were significantly positively associated with the PTS avoidance symptoms, intrusive rumination, deliberate rumination, friends support (a domain of social support), new possibilities, relating others, spiritual change, and life appreciation. PTS avoidance was positively related with both types of ruminations, and four domains of PTG such as personal strength, new possibilities, spiritual change, and life appreciation, and negative wellbeing. These findings are inline with previous research.

In the same vein, intrusive rumination was positively associated with deliberate rumination, spiritual change, negative well-being and energy wellbeing.

Deliberate rumination was positively associated with the family support, significant others support, and with the PTG domains (i.e., spiritual change, relating to others, and life appreciation), coping, negative wellbeing and energy wellbeing. Besides, family support was positively associated with the friends support and significant others support. More specifically, friend support was significantly positively associated with the domains of PTG including personal strength, spiritual change, life appreciation and coping. In addition, subscales of PTGI-SF were positively associated with each other. Finally, negative wellbeing was positively associated with energy wellbeing. These results are in the expected direction. A bulk of previous literature demonstrated a direct association between PTS, rumination, social support, and PTG (Linley & Joseph, 2004). Chan et al. (2011) demonstrated that the rumination may be helpful in reducing PTS symptoms and facilitation of PTG. The studies that were conducted to see the relationship between social support and PTG, past studies have provided a sufficient evidence of a positive association between social support and PTG (Dong et al., 2014; Prati & Pietrantonio, 2009). On the basis of past literature, one might conclude that the environmental factors such as nature of exposure to trauma, cognitive factors such as rumination patterns, and social support are associated with the PTG (Chopko, 2010; Meyerson et al., 2011; Tallman et al., 2010). There is non significant correlation between some study variables. The possible reason could be the small sample size. However, the trend of the relationship was in expected direction.

To see the comparison of study variable across gender, results showed that women scores significantly high on psychological distress as compared to men. Moreover, women scored high on stress as compared to men. In addition, women scored significantly high on both posttraumatic stress intrusive and avoidance

symptoms. These findings are inline with the past local (Aslam & Tariq 2007; Aslam & Kamal, 2013b; Hashmi et al., 2011; Hussain & Bhushan, 2011) as well as global research (Marshall, Frazier, Frankfurt, & Kuijer, 2015; Warsini et al., 2014) that demonstrated that the distress responses and posttraumatic symptoms are higher among female as compared to males. To see the difference on rumination patterns, women scored significantly high on both intrusive and deliberate rumination. When the both groups were compared on social support, women scored significantly high on social support as well as on the family support. These findings are inline with the past literature. For instance, Linley and Joseph (2004) demonstrated that women are more likely scored high on perceived social support, intrusive and deliberate ruminations, and PTG as compared to men. Similarly, Norris et al. (2002) demonstrated that distress responses are higher among women as compared to men. Women significantly scored high on the total score of posttraumatic growth. Moreover, on the subscales of PTG (i.e., new possibilities, spiritual change, and life appreciation) women scored high as compared to men. The findings are in accordance with the previous literature. For example, Bellizzi (2004) demonstrated that as compared to males, female survivors had reported more positive changes on four out of the five domains of the Posttraumatic Growth Inventory.

Conclusion

This pilot study generated good psychometric properties of scales and adequate reliability. Hence allowing the *Urdu* translated scales to be used for the hypotheses testing. Moreover, pilot study results suggest the validation of the scales (CFA) on the large data to ensure the construct validity of the scales.

FIRST TIME POINT OF THE STUDY

The broad objectives of the first time point of the study were to understand the PTS and PTG in an integrative psychosocial framework. More specifically; the T1 of the study was conducted to meet the following objectives.

Objectives

1. To see the prevalence of stress, anxiety, depression, PTS and PTG among flood-affected individuals.
2. To see the relationship between the flood appraisal, distress responses, rumination patterns, coping strategies, perceived social support, life satisfaction, psychological wellbeing, and PTG among flood-affected individuals.
3. To assess whether PTS, distress responses, rumination patterns, coping strategies, perceived social support, and PTG differ in male and female flood survivors.
4. To see the comparison of PTS, distress responses, rumination patterns, coping strategies, perceived social support and PTG on marital status, socioeconomic status and age.
5. To examine whether objective and subjective appraisal to flood, PTS, distress, flood related rumination, perceived social support, and coping could predict PTG

6. To examine the effects of flood appraisal on PTS and PTG through the potential mediator of flood-related rumination
7. To examine the moderating role demographic variables (i.e., age, education, flood appraisal) in the relationship between Stress, Anxiety, Depression, PTS, intrusive rumination, deliberate rumination, coping strategies, and PTG.
8. To see the moderating role of flood appraisal in the relationship between the coping strategies (such as, humour, self-distraction, active coping, planning, acceptance, and religious coping) and PTG.
9. To examine the mediating role of intrusive rumination PTS, and deliberate rumination between the flood appraisal and PTG.
10. To test the generalizability of the model explaining posttraumatic growth across gender.

Hypotheses

Based on the previous literature, the following hypotheses were formulated

1. Flood appraisal is positively associated with psychological distress, PTS, intrusive and deliberate rumination, and PTG; while negatively associated with wellbeing and life satisfaction among flood affected individuals.
2. Psychological distress is positively associated with PTS, intrusive rumination, and, deliberate rumination; while negatively associated with perceived social support, life satisfaction, psychological wellbeing, and PTG among flood affected individuals.
3. PTS will be positively associated with psychological distress, intrusive ruminations, deliberate ruminations, and PTG; while negatively associated

with life satisfaction and psychological wellbeing among flood affected individuals.

4. Intrusive rumination will be positively associated with the psychological distress, PTS, deliberate rumination, and negatively associated with life satisfaction and psychological wellbeing.
5. Deliberate rumination will be positively associated with intrusive rumination and PTG.
6. Intrusive rumination will be strongly associated with PTS; while deliberate rumination will be strongly associated with PTG.
7. Perceived social support is expected to be positively associated with life satisfaction, PTG, and well-being; while negatively associated with PTS and psychological distress.
8. Age will be negatively associated with psychological distress, PTS, intrusive rumination, deliberate rumination, and PTG; while positively associated with psychological wellbeing.
9. Education will be negatively associated with psychological distress, PTS, intrusive rumination; while positively associated with life satisfaction, PTG, and psychological wellbeing.
10. Income will be negatively associated with psychological distress, PTS, intrusive rumination; while positively associated with perceived social support, life satisfaction, psychological wellbeing, and PTG.
11. Coping strategies such as active coping, positive reframing, planning, acceptance, use instrumental support, and religious coping will be positively associated with PTG; while substance abuse coping, behaviour

- disengagement, humour, and self-blame coping will be negatively or not associated with PTG.
12. Women will score higher on psychological distress, PTS, intrusive/deliberate ruminations, and PTG, as compared to men.
 13. Women are more likely to use instrumental support, self-blame, venting, denial, and religious coping strategies; while men use acceptance, positive reframing, substance abuse, and humour coping.
 14. Individuals who are married and have high incomes are more likely to score low on PTS, psychological distress and high on life satisfaction and wellbeing.
 15. Older survivors are more likely to report enhanced spirituality as compared to adolescents and adults.
 16. Best predictors of PTG will be PTS, intrusive rumination, deliberate rumination, perceived social support, life satisfaction, and wellbeing; while, deliberate rumination will be the strongest predictor of PTG.
 17. Coping strategies such as active coping, planning, positive reframing, acceptance, and religious coping will positively predict PTG; while self-blame coping and substance use coping will negatively predict PTG.
 18. Both subjective and objective flood appraisal will act as a moderator between stress and PTG; PTS and PTG, and intrusive and deliberate rumination and PTG.
 19. Age will act as a moderator between coping strategies (positive reframing, active coping, planning, religious coping, and acceptance coping) and PTG.
 20. Education will moderate the relationship between Stress and PTG, Anxiety and PTG, Depression and PTG, PTS and PTG, and rumination and PTG.

21. Perceived social support will act as a moderator in the relationship between PTS and PTG.
22. Intrusive rumination, PTS, and deliberate rumination will mediate the relationship between flood appraisal and PTG.

Operational Definitions of Variables

Flood-related exposure. Flood-Related Exposure is the disaster exposure in the form of individual's subjective and objective appraisal of fear and damage to surrounding areas, specifically, individuals' feelings of safety, life threat, and loss of personal characteristic resources. In addition, it is the perception of loss of another family member, possible injury to themselves or others, and potentially witnessing the death or suffering of others (Goenjian et al., 1995; Hizli et al., 2009).

Flood exposure is operationally defined as the scores on the Flood-Related Exposure Scale (FRES). Higher the score on the scale indicates higher exposure to flood and vice versa. FRES has two subscales, Flood Exposure Subjective and Flood Exposure Objective.

Flood exposure subjective. Flood Exposure Subjective (FES) is defined as the scores on the subscale subjective exposure to flood of FRES. Higher scores on this subscale would demonstrate high subjective exposure to flood and vice versa.

Flood exposure objective. Flood Exposure Objective (FEO) is operationally defined as the scores on the subscale Objective Exposure to flood of FRES. Higher scores on this subscale would indicate the high objective exposure to flood and vice versa.

Posttraumatic Stress (PTS). Posttraumatic stress may include disturbing recurring symptoms of flashbacks, hyperarousal, numbness, avoidance, and distressed memories of the event (American Psychiatric Association, 2013).

PTS is defined as the scores on the Impact of Event Scale (IES; Horowitz et al., 1979). High scores on this scale will indicate high PTS and vice versa. IES caters two types of symptoms, intrusive and avoidance.

PTS Avoidance symptoms. PTS Avoidance symptoms are defined as the scores on avoidance subscale of IES. High scores on this subscale will indicate high avoidance symptoms and vice versa.

PTS Intrusive symptoms. PTS intrusive symptoms are defined as scores on the Intrusive subscale of IES. High scores on this subscale will be the indicative of high intrusive symptoms and vice versa.

Psychological distress. Psychological distress may include dysphoric mood, chronic sadness, feelings of worthlessness, poor work performance, irritability, poor concentration, and inability to interact with other people (Lovibond & Lovibond, 1995).

Psychological distress is operationalized as scores obtained on the DASS (Lovibond & Lovibond, 1995). High scores on the scale will indicate high psychological distress and vice versa.

Stress. Stress is defined as the scores on the subscale Stress of DASS. High scores on this subscale will indicate high stress and vice versa.

Anxiety. Anxiety is defined as the scores on the subscale Anxiety of DASS. High scores on this subscale will indicate high Anxiety and vice versa.

Depression. Depression is defined as the scores on the subscale Depression of DASS. High scores on this subscale will indicate high depression and vice versa.

Intrusive ruminations. Intrusive ruminations refers to recursive and repetitive, rehearsal of cognitive content. These are spontaneous intrusions that one does not choose to bring to mind (Calhoun, et al., 2010).

Intrusive Rumination is operationalized as scores attained on the “Intrusive Rumination” subscale of Event Related Rumination Inventory (ERRI; Cann et al., 2011). High scores on the subscale Intrusive Rumination will reflect high Intrusive Rumination and vice versa.

Deliberate rumination. Deliberate ruminations involve a reflective consideration and a deliberate effort to solve problems or deal with the situations (Calhoun et al., 2010; Nolen-Hoeksema & Davis, 2004).

Deliberate Rumination is operationalized as scores attained on the “deliberate rumination” subscale of Event Related Rumination Inventory (ERRI; Cann et al., 2011). High scores on the subscale of Deliberate Rumination will reflect high Deliberate Rumination and vice versa.

Posttraumatic growth. Positive psychological change experienced as a result of confronting with profoundly upsetting and traumatic life events is referred as PTG (Calhoun & Tedeschi, 2006).

PTG is operationalized as scores obtained on the PTGI-SF (Cann et al., 2010). High score demonstrates high PTG and vice versa. PTGI-SF has five subscales that include:

Appreciation of life. After experiencing the traumatic event, survivors start to give more attention to small things that were once considered unimportant or less significant (Lindstrom, Cann, Calhoun, & Tedeschi, 2013).

Appreciation of life is operationalized as scores on the subscale Appreciation of Life of PTGI-SF. High scores on this subscale reflect more life appreciation and vice versa.

New possibilities. After experiencing the traumatic event, the survivors discover and/or identify the new opportunities that did not exist before the trauma (Lindstrom et al., 2013).

New possibilities are defined as scores on the subscale New Possibilities of PTGI-SF. High score on the subscale indicates identifying the new possibilities in life and vice versa.

Relations with others. The survivors may perceive emotional connectedness with others as well as feeling of closeness in interpersonal relationships (Lindstrom et al., 2013).

Relations with others is defined as scores obtained on the subscale Relating with others of PTGI-SF. High scores on this subscale reflects improved relations with others and vice versa.

Personal strength. It refers to the perception of more potential to deal with future challenges of life (Lindstrom et al., 2013).

Personal strength is operationalized as scores obtained on the subscale Personal Strength of PTGI-SF. High scores on this subscale will indicate the perception of personal strength and vice versa.

Spiritual change. It refers to the subjective perception of better understanding regarding spiritual matters (Lindstrom et al., 2013).

Spiritual change is operationalized as scores on the subscale Spiritual change of PTGI-SF. High scores on this subscale will indicate more spiritual awakening and vice versa.

Coping styles. Coping strategies are the specific conscious efforts, which an individual utilize to tackle personal and interpersonal issues (Folkman & Lazarus, 1980).

Coping styles are operationally defined as scores on the Brief Cope Inventory. High scores on each subscale will indicate more the use of that respective coping style and vice versa. Brief Cope has 14 subscales. Following are the definitions of each coping strategy as suggested by Carver (1997).

Active coping. Active coping is exerting efforts to remove or thwart the stressor. It is operationally defined as the scores on subscale Active coping. High scores on this subscale will reflect more use of active coping style and vice versa.

Denial coping. Denial is an attempt to reject the reality regarding any stressful event. It is defined as the scores on the subscale Denial Coping. High scores on this subscale will reflect more use of denial coping and vice versa.

Substance use coping. Substance use coping is the use of alcohol and drugs. It is operationalized as scores obtained on the subscale Substance use coping. High scores on this subscale will reflect more use of substance use coping style and vice versa.

Use of emotional support. Use of emotional support coping is a tendency to get emotional support from the significant others. It is operationalized as scores obtained on Use of emotional support coping. High scores on this subscale will reflect more use of emotional support coping style and vice versa.

Self-distraction coping. Self-distraction coping is to distract oneself from stress induced by the stressor. It is operationalized as the scores on Self-distraction coping. High scores on this subscale will reflect more use of Self-distraction coping style and vice versa.

Use of instrumental support. It is defined as seeking assistance about what to do. It is operationalized as scores obtained on Use of instrumental support coping. High

scores on this subscale will reflect more use of instrumental support coping style and vice versa.

Behavioural disengagement. Behavioural disengagement is to give up from the struggle to achieve the goal because of interference of stressor. It is operationalized as scores obtained on the Use of behavioural disengagement coping. High scores on this subscale will reflect more use of behavioural disengagement and vice versa.

Venting coping. Venting coping is an increased awareness of one's emotional distress as well as the tendency to discharge these feelings. It is operationalized as scores on venting coping. High scores on this subscale will reflect more use of venting coping and vice versa.

Positive reframing. Positive reframing is making best of the situation or seeing it in a more favourable way. It is operationalized as scores on the Positive reframing coping. High scores on this subscale will reflect more use of positive reframing coping and vice versa.

Planning coping. Planning coping is defined as thinking about how to confront the stressor. It is operationalized as scores obtained on the Planning coping. High scores on this subscale will reflect more use of planning coping and vice versa.

Humour coping. It is the use of humour as a coping mechanism. It is operationalized as scores obtained on the Humour coping. High scores on this subscale will reflect more use of humour coping and vice versa.

Acceptanc coping. Acceptance coping is the acknowledgement of the fact that this stressful situation or event is real. It is operationalized as scores on the Acceptance coping. High scores on this subscale will reflect more use of acceptance coping style and vice versa.

Religious coping. Religious coping is increased engagement in religious activities or turning to religion. It is operationalized as scores on the Religious coping. High scores on this subscale will reflect more use of religious coping style and vice versa.

Self-blame coping. Self-blame is the tendency to blame oneself for any act or situation. It is operationalized as scores obtained on the Self-blame coping. High scores on this subscale will reflect more use of Self-blame coping style and vice versa.

Perceived social support. Perceived social support characterize the subjective perceptions of the extent to which social networks such as friends, family, or significant others are accessible to support (Cohen & McKay, 1984). Perceived social support is operationalized as score obtained on the MSPSS (Zimet et al., 1988). High scores on this scale indicate the more perception of social support and vice versa.

Satisfaction with life. It is the extent to which an individual positively evaluates his/her overall life quality (Saris, Veenhoven, Scherpenzeel, & Bunting, 1996).

Life Satisfaction is operationalized as score obtained on the SWLS (Diener et al., 1985). High scores on this scale indicates greater the satisfaction with life and vice versa.

Psychological wellbeing. Psychological wellbeing refers to how individuals assess and evaluate their lives. According to Diener (2009), these evaluations may be in the form of cognitive appraisal that one's life is great, experiencing positive affect, and generally low levels of negative mood (Michaelson, Abdallah, Steuer, Thompson, & Marks, 2009).

For the current study, psychological wellbeing is defined as the score on the Well-Being Questionnaire(W-BQ12; Mitchell & Bradley, 2001). High scores on this scale would demonstrate greater wellbeing and vice versa. Well-Being Questionnaire has three subscales that include:

Positive wellbeing. Positive wellbeing entails the feelings of being happy, satisfied, or pleased with personal life and being eager to tackle daily tasks or cope with any serious problem in life (Mitchell & Bradley, 2001).

It is operationally defined as scores obtained on the subscale Positive wellbeing. High scores on this subscale will indicate positive wellbeing and vice versa.

Negative wellbeing. Negative wellbeing entails the symptoms of crying spells or feel like it, feeling downhearted and blue, panicky, or getting upset easily (Mitchell & Bradley, 2001).

Negative wellbeing is operationalized as scores obtained on the subscale negative wellbeing. High scores on this subscale indicate higher negative wellbeing and vice versa.

Energy wellbeing. Energy wellbeing is feeling energetic, active or vigorous, fresh and rested, and no feelings of exhaustion, dullness, tiredness or being worn-out (Mitchell & Bradley, 2001).

Energy wellbeing is operationally defined as scores obtained on the subscale energy wellbeing. Higher scores on energy wellbeing subscale would indicate higher energy wellbeing and vice versa.

Sample

A sample of 2000 flood affected individuals was taken from the different flood-affected districts from Punjab, Khyber Pukhtunkhwa; and Azad Jammu and Kashmir (AJK) of Pakistan (for detailed sample description see Figure 3). Age of the participants was ranged was from 16 to 64 years ($Mean = 28.24$, $SD = 9.58$). Monthly income of the participants was ranged from 30,000 to 2, 000, 00 ($M = 14.67$, $SD = 12.44$). Almost, 74.9 percent males and 24. 9 percent females were employed. Approximately, 78 % of study participants had faced some property loss during the flood. The data was collected during January 2013. The data was collected almost two and half years after the flood. Effect of flood was seen on the variable of age, education, marital status, intensity of exposure to trauma, nature of damages and loses past psychiatric illness, and socio economic status. Purposive sampling technique was used. Only those participants were taken as sample that had minimum 10 years of

education and had no diagnosed psychiatric illness. Detailed description of the sample characteristics are presented in Table 5.

Table 5

Demographics Characteristics of the Participants of First Time Point (N=2000)

Demographics	<i>f</i>	%
Gender		
Male	1402	70.1
Female	598	29.9
Age groups (in years)		
Adolescents (16-19)	433	21.9
Young Adults (20-40)	1240	62.7
Older Adults (41-64)	308	15.5
Missing	19	1.3
Education		
Matriculation	233	11.8
Intermediate	653	33.0
Graduation	704	35.6
Masters	389	19.7
Missing	21	1.5
Marital Status		
Unmarried	1097	54.8
Married	875	43.7
Widowed	09	0.5
	19	1.0
Employment Status		
Employed	834	41.7
Unemployed	1066	53.3
	100	5.0

Table 5 shows the complete description of the sample. Geographical description of the sample and educational characteristics are reported in the Table 6 and Table 7.

Table 6

Frequencies and Percentages of the Geographical Distribution of the Sample (N=2000)

Province	Total (N=2000)	Men (n=1402)		Women (n=598)	
	<i>n</i>	<i>f</i>	%	<i>f</i>	%
Punjab	903	494	54.7	409	45.3
Mianwali	327	181	55.35	146	44.65
Deragazi Khan	298	238	77.18	60	20.13
Muzaffargarh	278	75	23	203	73.0
KPK	796	655	82.3	141	17.7
Nowshara	400	355	88.8	45	11.3
Peshawar	396	300	75.8	96	24.2
Neelum Valley	301	253	84.1	48	15.9

Table 6 demonstrates the frequencies and percentages of the sample in accordance with their geographical location.

Table 7

Frequencies and Percentages of Education across Gender (N=2000)

Gender	Matriculation	Intermediate	Graduation	Master	Missing	Total
Men	167 (8.4%)	428 (21.6%)	514 (26.0%)	277 (14.0%)	16 (1.14%)	1386 (70.1%)
Women	65 (3.3%)	225 (11.4%)	190 (9.6%)	112 (5.7%)	6 (1.00%)	592 (29.9%)
Total	232 (11.7%)	653 (33.0%)	704 (35.6%)	389 (19.7%)	22 (1.10%)	1978 (100 %)

Table 7 shows the frequencies and percentages of the participant's education level. The minimum education of the participants is matriculation and maximum is the master level.

Procedure

For the T1 of the data, six enumerators were hired and given the five hours training about how to gather the data. The training was given by the researcher. The enumerators were selected from the different areas, such as three from Punjab, two from KPK and one from Neelum valley AJK. The minimum education of the enumerators was the bachelors; prior to the questionnaires administration, informed consent of the participants was taken. Participants' signatures were taken on the consent form that they are willing to provide the data (for detail descriptions of the consent form see the Appendix A). Before completing the measures, all participants provided demographic information, such as name, address, contact numbers, gender, socioeconomic status, employment status, number of family members, academic class, marital status, employment status, nature of damages and losses during the flood and describe a traumatic event they experienced after the flood that may have caused them noteworthy trouble. Instructions to fill the forms were given. Each participant him/herself filled the form. They were instructed that there was no right or wrong answers, and to respond to the items by selecting an option, which resembles closely to their feelings, behaviours, or situation. Data was collected in the community settings and it took almost 30 minutes to complete the questionnaire booklet. At the end, respondents were thanked for their participation and cooperation.

RESULTS

Assumptions of Normality and Missing Data

Descriptive statistics and bivariate correlation analysis between the predictors and outcome variables was computed by using Predictive Analytics Software (PASW) 18. The normality of each variable is computed in terms of its skewness. Results showed that the data was normally distributed (Field, 2009). Furthermore, Independent sample *t*-test and Analysis of Variance (ANOVA) were computed to see the mean differences. For Regression Analysis, we tested the assumptions of univariate and multivariate normality. Moreover, Mahalanobis distance scores demonstrated no multivariate outliers. To see whether the residuals in the model are independent, Durbin-Watson test was used (Tabachnick & Fidell, 2001). Scatter plots and residuals demonstrated the assumptions of homoscedasticity, linearity, and normality were all satisfied (Field, 2009). To examine the correlations, diagnostic tests of multicollinearity were conducted (Table 19). It demonstrated that the predictors were not highly correlated. The collinearity statistics were all within the accepted limits. Moreover, the assumption of multicollinearity was deemed to have been met (Coakes, 2005; Kelley & Maxwell, 2003). For Model testing, Structural Equation Modeling (SEM) was done by using the software, Analysis of Moment Structures (AMOS 16). Missing data in the study was handled by using the standard method.

Table 8
Alpha Reliability Coefficients and other Psychometric Properties of the Scales Used in the Main Study (N=2000)

Scales	n	Item	M	SD	α	Range		Skew
						Potential	Actual	
Flood Related Exposure Scale	1982	11	16.11	9.56	.89	0-44	0-44	.46
Objective Exposure (OE)	1973	7	9.68	6.17	.82	0-28	0-28	.55
Subjective Exposure(SE)	1982	4	6.41	4.87	.87	0-16	0-16	.39
Depression Anxiety Stress Scale	1974	21	21.08	12.60	.93	0-63	0-62	.52
Subscale Stress	1968	7	8.22	4.37	.83	0-21	0-21	.30
Subscale Anxiety	1971	7	6.03	4.63	.86	0-21	0-20	.63
Subscale Depression	1971	7	6.85	4.70	.84	0-21	0-21	.60
Impact of event scale (IES)	1949	15	34.21	17.43	.89	0-75	0-75	.06
Subscale Intrusive	1947	7	16.33	8.88	.85	0-35	0-35	.15
Subscale Avoidance	1949	8	17.87	10.00	.86	0-40	0-40	.07
Intrusive Rumination	1955	10	14.30	7.58	.92	0-30	0-30	-.04
Deliberate Rumination	1953	10	16.95	7.07	.82	0-30	0-30	-.31
Posttraumatic Growth Inventory	1960	10	30.15	9.71	.84	0-50	0-50	-.59
Multidimensional Scale of Perceived Social Support (MSPSS)	1954	12	59.97	15.70	.91	12-84	12-84	-.76
Family support	1953	4	21.44	5.82	.86	4-28	4-28	-.01
Friend support	1959	4	19.53	5.84	.87	4-28	4-28	-.73
Significant other support	1961	4	19.01	6.51	.83	4-28	4-28	-.65
Satisfaction with Life Scale	1930	7	22.92	6.94	.82	5-35	5-35	-.58
Brief COPE	1852	28	71.56	12.18	.84	28-112	28-109	-.47
Psychological Wellbeing Scale	1963	12	22.06	6.46	.82	0-36	0-36	.02
Positive Wellbeing	1967	4	6.96	3.01	.84	0-12	0-12	-.16
Negative Wellbeing	1967	4	3.79	3.05	.76	0-12	0-12	.57
Energy Wellbeing	1964	4	6.88	2.41	.72	0-12	0-12	.07

Note. nis different because of missing

Table 8 depicts the alpha reliabilities, mean, standard deviations, ranges, and skewness of the measures used in main study. The values of alpha coefficients range from .71 to .93. The values of skewness are in acceptable ranges, that suggests the normal distribution of the data (Field, 2009). The reliabilities of all the scales are satisfactory.

Validation of the Scales

Confirmatory factor analysis (CFA) of the DASS, Event Related Rumination Inventory, Posttraumatic Growth Inventory-SF, Well-Being Questionnaire, Multidimensional Scale of Perceived Social Support, and Satisfaction with Life Scale

was done by using AMOS. In the following tables we are reporting the CFA of the scales used in the main study.

Table 9

Confirmatory Factor Analysis with Factor Loadings of DASS

Subscales	Item no.	Loading
Stress	1	.63
	6	.57
	8	.49
	11	.72
	12	.71
	14	.44
	18	.59
Anxiety	2	.65
	4	.66
	7	.69
	9	.55
	15	.67
	19	.60
	20	.72
Depression	3	.54
	5	.60
	10	.65
	13	.68
	16	.64
	17	.69
	21	.68

Table 9 shows the CFA of the Depression Anxiety and Stress Scale. Loadings of the scale are ranged from .44 to .72. In addition, all the factor loadings were found above the criteria ($>.3$). The DASS was used in main study without any further modifications.

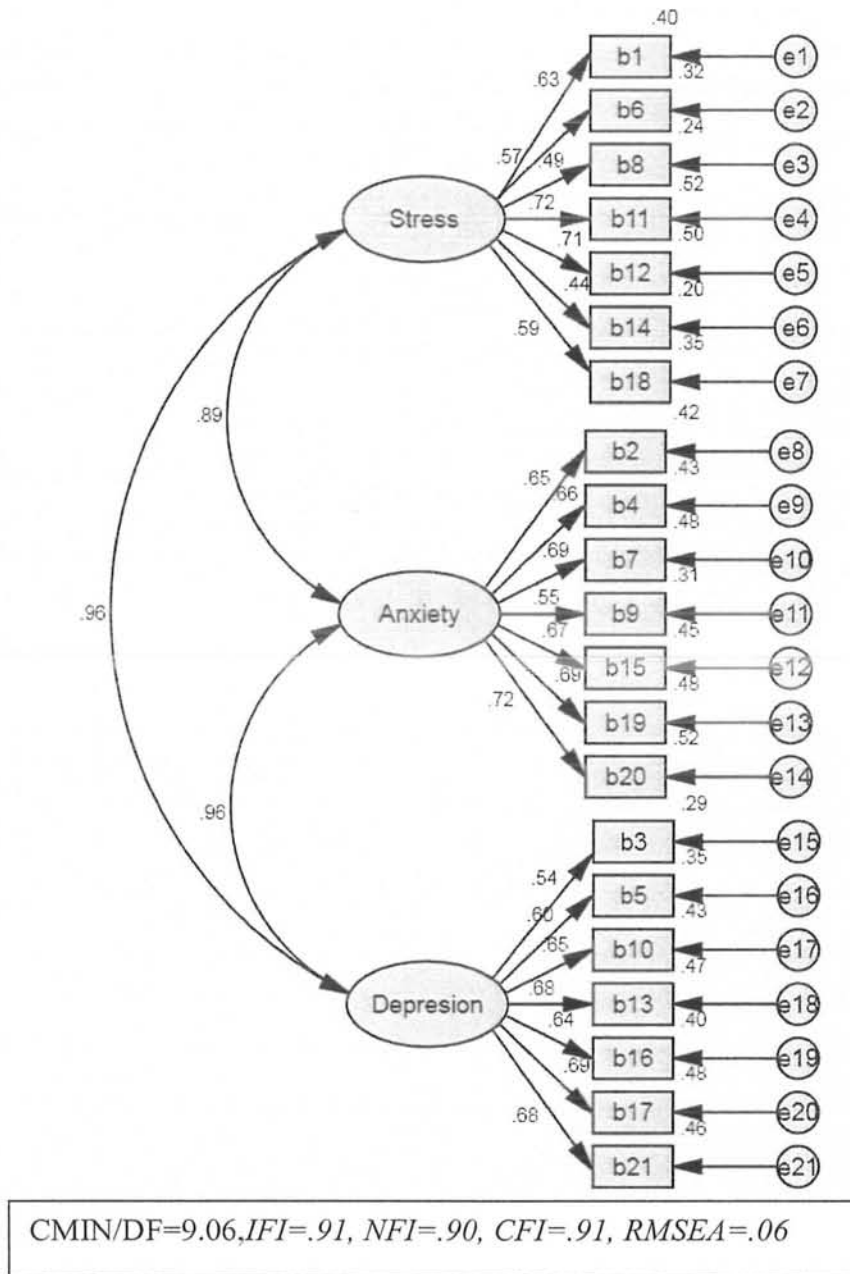
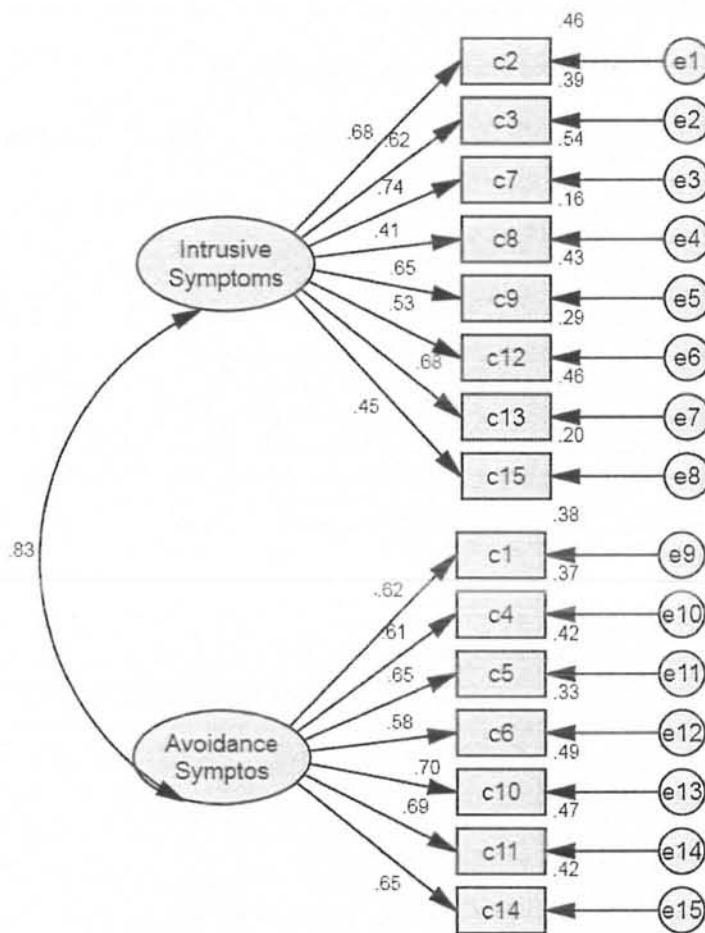


Figure 4. Confirmatory factor Analysis of DASS

Table 10*Confirmatory Factor Analysis of Impact of Event Scale (IES) (N=2000)*

Subscales	Item no.	Loadings
IES Intrusive symptoms	2	.70
	3	.64
	7	.72
	8	.38
	9	.61
	12	.53
	13	.66
	15	.46
IES Avoidance Symptoms	1	.63
	4	.58
	5	.66
	6	.53
	10	.70
	11	.69
	14	.67

Table 10 demonstrates the factor loadings of the IES that is ranged from .38 to .67. Results showed that all the factor loadings were above the criteria ($>.3$). Hence, this scale was used without any further modifications. Values of the Fit indices have been presented in Figure 5 and Table 16.



CMIN/DF=2.64,IFI=.91, NFI=.98, CFI=.90, RMSEA=.07

Figure 5. Confirmatory factor Analysis of the IES

Table 11*Confirmatory Factor Analysis of Event Related Rumination Inventory (N=2000)*

Subscales	Item no.	Loadings
Intrusive Rumination	1	.72
	2	.74
	3	.68
	4	.68
	5	.71
	6	.71
	7	.63
	8	.73
	9	.67
	10	.63
Deliberate Rumination	1	.50
	2	.66
	3	.66
	4	.62
	5	.64
	6	.67
	7	.62
	8	.67
	9	.69
	10	.85

Table 11 shows the CFA of the ERRI. Factor loadings were examined and all the factor loadings were found above the criteria (>.3). The loadings are ranged from .50 to .85. Values of fit indices are given in Table 16. Results showed that scale can be used without any further modifications.

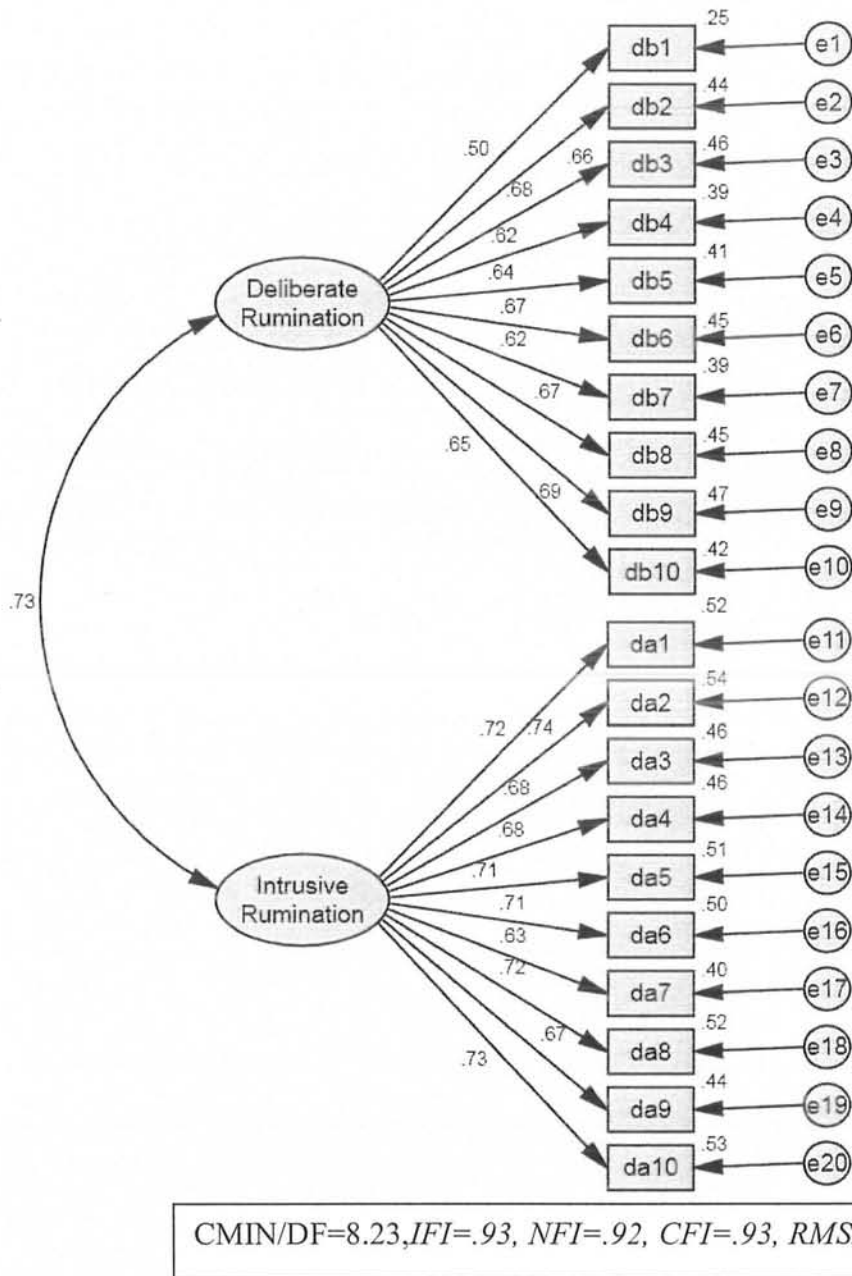


Figure 6. Confirmatory Factor Analysis of Event Related Rumination Inventory

Table 12

Confirmatory Factor Analysis of Short Form of Posttraumatic Growth Inventory (PTGI-SF) and its Subscales (N=2000)

Subscales	Item no.	Loadings
Relating to others	5	.61
	10	.47
New possibilities	3	.68
	6	.50
Personal strength	7	.74
	9	.70
Spiritual Change	4	.72
	8	.58
Life Appreciation	1	.62
	2	.79

Table 12 shows the CFA of the PTGI-SF. Factor loadings were examined and all the factor loadings were found above the criteria ($>.3$). The loadings are ranged from .47 to .79. Values of fit indices are satisfactory and are reported in Table 16.

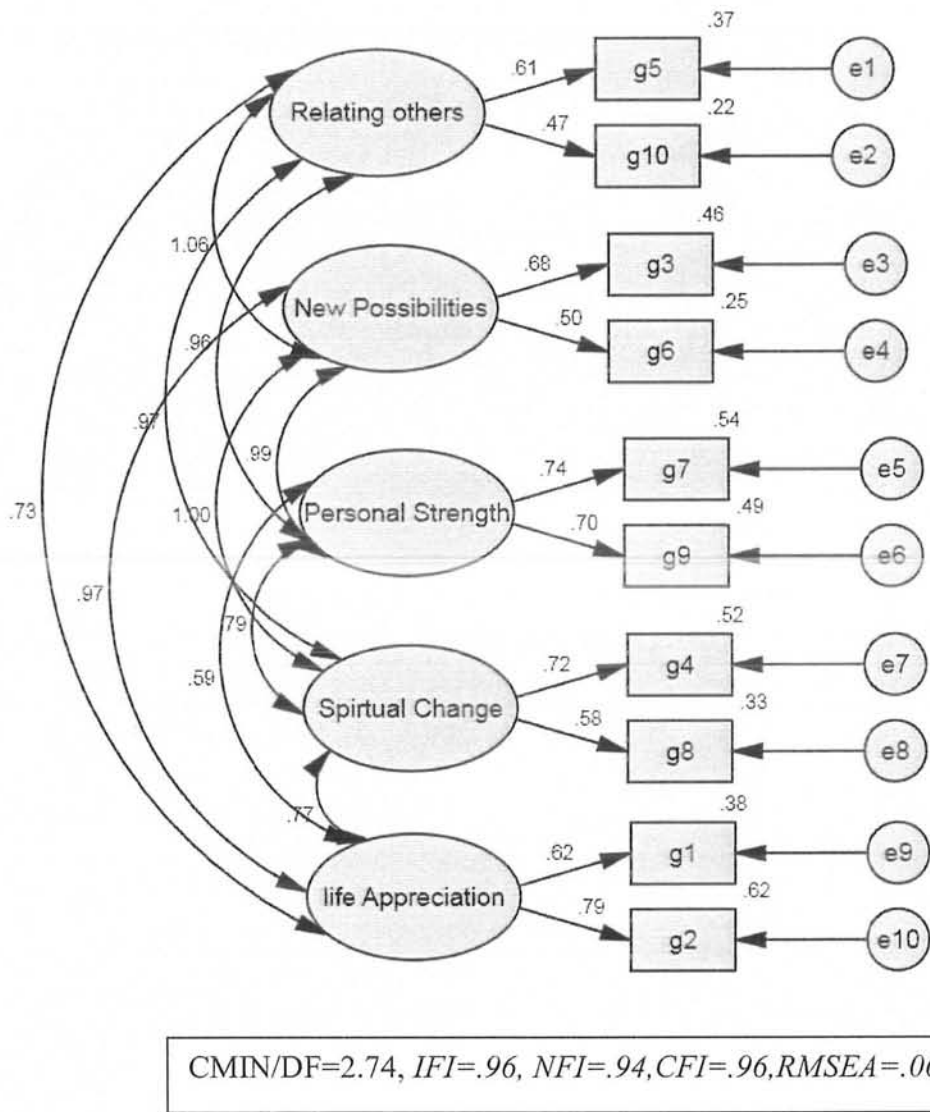
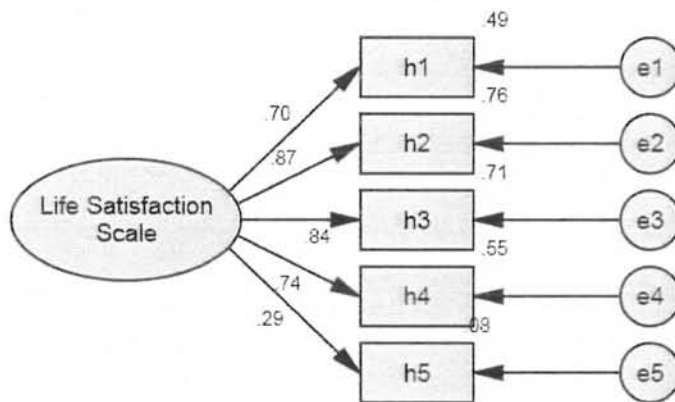


Figure 7. Confirmatory factor Analysis of PTGI-SF

Table 13*Confirmatory factor Analysis of Satisfaction with Life Scale (N=2000)*

Satisfaction with life	Item no.	Loadings
	1	.70
	2	.88
	3	.84
	4	.73
	5	.39

Table 13 shows the CFA of Satisfaction with Life Scale. Factor loadings were examined and all the factor loadings were found above the criteria ($>.3$). However, factor loading of the item 5 is .29. So, it is accepted without any further modification. The loadings are ranged from .39 to .88. The values of fit indices are reported in Table 16.



CMIN/DF=4.05, IFI=.99, NFI=.99, CFI=.99, RMSEA=.04

Figure 8. Confirmatory factor Analysis of Satisfaction with Life Scale

Table 14*Confirmatory Factor Analysis of the MSPSS (N=2000)*

<i>Subscales</i>	<i>Item no.</i>	<i>Loading</i>
Family Support	3	.82
	4	.80
	8	.77
	11	.77
Friend Support	6	.80
	7	.78
	9	.82
	12	.73
Significant other support	1	.70
	2	.82
	5	.78
	10	.77

Table 14 shows the CFA of MSPSS. The loadings are ranged from .70 to .82. For the improvement of model fit indices, Covariance between the item 1 and 2 are added. Values of fit indices are after the modifications are satisfactory and are reported in Table 16.

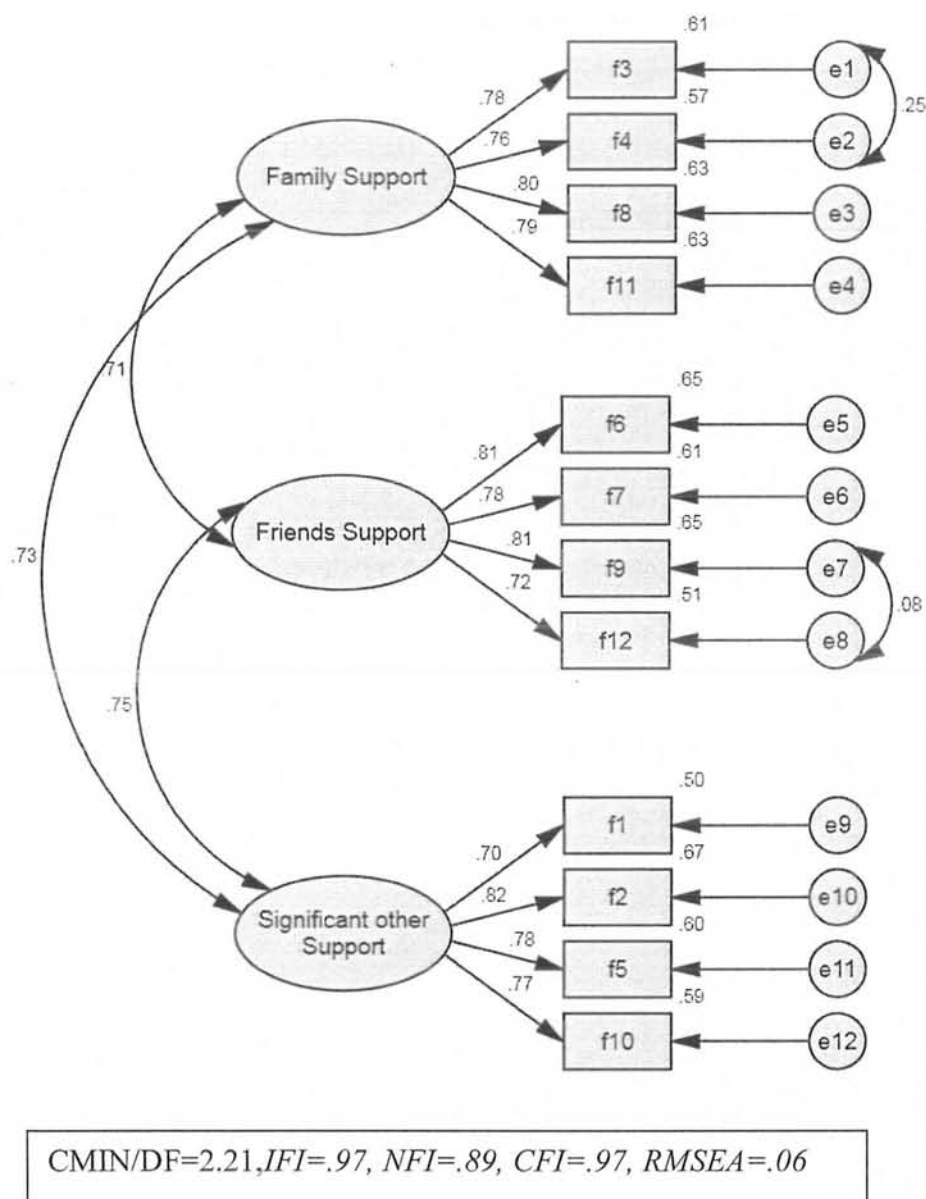


Figure 9. Confirmatory factor Analysis of the Multidimensional Scale of Perceived Social Support

Table 15*Confirmatory Factor Analysis of Wellbeing Questionnaire (WBQ-12) (N=2000)*

<i>Subscales</i>	<i>Item no.</i>	<i>Loadings</i>
Negative wellbeing	1	.74
	2	.79
	3	.76
	4	.74
Energy Wellbeing	5	.13
	6	.77
	7	.68
	8	.22
Positive Wellbeing	9	.73
	10	.65
	11	.64
	12	.63

Table 15 shows the CFA of Psychological Wellbeing Scale (WBQ-12). The loadings are ranged from .13 to .74. Based on initial criteria of factor loading i.e. item loadings $>.3$, items were examined. Items 5(.13) and 8(.22) showed poor loadings while rest all items were having good factor loadings. Covariance between the item 5 and 8 are added. After the modification the values of fit indices are satisfactory and are reported in Table 16.

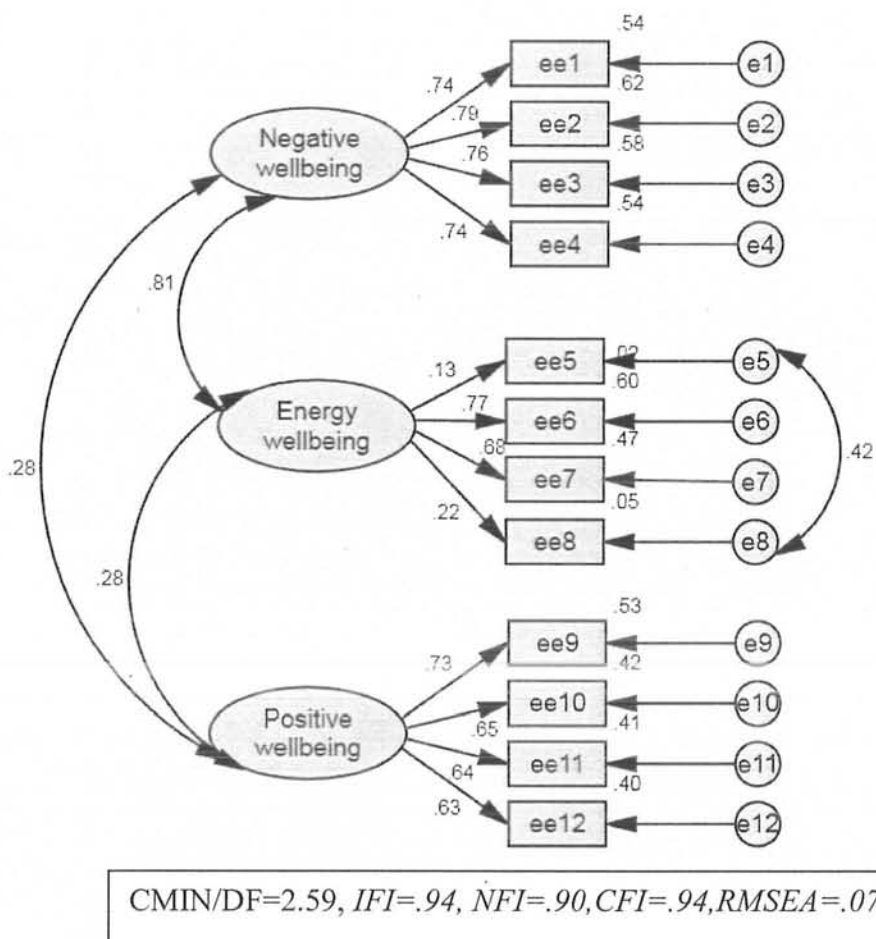


Figure 10. Confirmatory factor Analysis of Wellbeing Questionnaire (WBQ-12)

Table 16*Fit Indices of Scales used in the Main Study (N=2000)*

Scales	χ^2	<i>df</i>	CMIN/DF	<i>IFI</i>	<i>NFI</i>	<i>CFI</i>	<i>RMSEA</i>
DASS ^a	1685.11	186	9.06	.91	.90	.91	.06
IES ^b	235.15	89	2.64	.91	.89	.90	.07
ERRI ^c	1390.69	169	8.23	.93	.92	.93	.06
PTGI-SF ^d	69.13	25	2.76	.96	.94	.96	.06
SWLS ^e	16.19	4	4.05	.99	.99	.99	.04
MSPSS ^f	133.66	51	2.21	.97	.89	.97	.06
WBQ-12 ^g	113.01	44	2.59	.94	.90	.94	.07

^a Depression, Anxiety Stress Scale; ^b Impact of Event Scale; ^c Event Related Rumination Inventory; ^d Posttraumatic Growth Inventory- Short Form; ^e Satisfaction with Life Scale; ^f "Multidimensional Scale of Perceived Social Support"; ^g Wellbeing Questionnaire.

The construct validity of the scale that was used in the study was conducted. Table 16 illustrates the CFA of all the scales, including, DASS; ERRI; IES; PTGI-SF; MSPSS; SWLS; and WBQ-12 was conducted. The CFA of Brief Cope was not done and the reason for its well established psychometrics and well used scale in Pakistani culture. The validity indices Normed Fit Index (*NFI*), Incremental fit index (*IFI*), and comparative fit index (*CFI*) were conducted that are in acceptable range. The values of the indices are above .90. This shows that the scale used in the study are valid. Moreover, the Value of Root Mean Square Error of Approximation (*RMSEA*) is also in acceptable ranges, which are below .80.

Prevalence of Psychological Distress and Posttraumatic Stress

To see the prevalence of Posttraumatic stress, stress, anxiety and depression among the study population and results are presented in the Table 17.

Table 17

Prevalence of Psychological Distress and Posttraumatic Stress among Flood affected Individuals (N=1965)

Level of Stress	Total (N=1953) f (%)	Male (n=1364) f (%)	Female (n=589) f (%)
Normal Stress	939 (48.06)	687(50.4)	252(42.8)
Mild Stress	302 (15.46)	215(15.8)	87(14.8)
Moderate Stress	369 (18.88)	238(17.4)	131(22.2)
Severe Stress	270 (13.82)	181(13.3)	89(15.1)
Extremely Severe Stress	73 (3.74)	43(3.2)	30(5.1)
		<i>Male</i>	<i>Female</i>
Levels of Anxiety	(N=1962)	(n=1370) f (%)	(n=592) f (%)
Normal Anxiety	721 (36.75)	524(38.2)	197(33.3)
Mild Anxiety	146 (4.44)	102(7.4)	44(7.4)
Moderate Anxiety	403 (20.24)	263(19.2)	140(23.6)
Severe Anxiety	227 (11.57)	151(11.0)	76(12.8)
Extremely Severe	465 (23.70)	330(24.1)	135(22.8)
		<i>Male</i>	<i>Female</i>
Levels of Depression	(N=1962)	(n=1371) f (%)	(n=591) f (%)
Normal Depression	709 (36.12)	523(38.1)	186(31.5)
Mild Depression	320 (16.30)	198 (14.4)	122(20.6)
Moderate Depression	490 (24.96)	339(24.7)	151(25.5)
Severe Depression	258 (13.14)	183(13.3)	75(12.7)
Extremely Severe	185 (9.42)	128(9.3)	57(9.6)
		<i>Male</i>	<i>Female</i>
PTS levels	(N=1933)	(n=1348) f (%)	(n=585) f (%)
Subclinical Range	152 (7.86)	125(9.3)	27(4.6)
Mild Range	479 (24.78)	337(25.0)	142(24.3)
Moderate Range	702 (36.32)	493(36.6)	209(35.7)
Severe Range	600 (31.04)	393(29.2)	207(35.4)

To see the prevalence of PTS, Stress, Anxiety, and Depression among flood-affected individual's frequencies and percentages of both the men and women are

presented in Table 17. Almost 3.74 % of the total sample has shown the extremely severe stress, 23.70 % has shown the extremely severe anxiety and 9.42 % has shown extremely severe depression. In addition, 31.04 % sample has demonstrated severe posttraumatic stress.

Table 18

Prevalence of Posttraumatic Growth among Flood affected Individuals (N=1950)

<i>Level of PTG</i>	Total (N=1950) <i>f</i> (%)	Male (n=1364) <i>f</i> (%)	Female (n=586) <i>f</i> (%)
Mild PTG	509 (26.1%)	375 (27.5%)	134(22.9%)
Moderate PTG	480 (24.6%)	345(25.3%)	135(23.0%)
High PTG	560 (28.7%)	374(27.4%)	186(31.7%)
Extremely High PTG	401(20.6%)	270(19.8%)	131(22.4%)

Table 18 shows the PTG among the flood affected individuals. Results showed that both men and women showed PTG at mild, moderate, high, and extremely high level.

Bivariate Correlations between the Study Variables

To see the relationship between the study variables bivariate correlations was computed. The results are presented in Table 19.

Table 19
Correlations between Predictor and Outcome Variables (N =1973)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 FES	-	.60**	.51**	.42**	.40**	.33**	-.01	.01	-.28**	.21**	.11**	.18**	.10**	.15**	.26**
2 FEO		-	.45**	.44**	.43**	.35**	-.07**	.02	-.28**	.18**	.05*	.13**	.02	.16**	.24**
3 Distress			-	.55**	.57**	.38**	-.12**	-.07**	-.61**	.08**	.03	.10**	-.06**	-.01	.23**
4 PTS				-	.75**	.62**	-.07**	.06*	-.31**	.31**	.20**	.26**	.13**	.21**	.37**
5 Intru. rumination					-	.65**	-.10**	.01	-.41**	.26**	.17**	.23**	.07**	.18**	.34**
6 Deli. rumination						-	.03	.14**	-.16**	.42**	.27**	.35**	.21**	.29**	.48**
7 Life satisfaction							-	.53**	.36**	.42**	.34**	.32**	.41**	.33**	.25**
8 Social support								-	.28**	.46**	.37**	.32**	.36**	.41**	.31**
9 Wellbeing									-	.22**	.18**	.16**	.34**	.22**	-.04
10 PTG										-	.75**	.82**	.78**	.78**	.74**
11 Relating to others											-	.50**	.53**	.50**	.40**
12 New possibilities												-	.58**	.53**	.56**
13 Personal strength													-	.52**	.38**
14 Spiritual change														-	.48**
15 Life appreciation															-

Note. FES= Flood Exposure Subjective; FEO= Flood Exposure Objective; PTS= Posttraumatic Stress; Intru. Rumination= Intrusive Rumination; Del. Rumination= Deliberate Rumination; PTG= Posttraumatic Growth

* $p < .05$, ** $p < .01$

Table 19 demonstrates the bivariate correlation between the study variables. Results showed that both subjective and objective flood appraisal is positively associated with the psychological distress, PTS, intrusive and deliberate rumination and PTG while the subjective and objective flood appraisal is negatively associated with psychological wellbeing and life satisfaction. Psychological distress is significantly negatively associated with perceived social support, life satisfaction, wellbeing, and positively associated with PTS, intrusive rumination, deliberate rumination and with PTG. In addition, PTS is positively associated with psychological distress, intrusive rumination, deliberate rumination and PTG while, PTS is negatively associated with life satisfaction and psychological wellbeing. In addition, intrusive rumination is strongly positively associated with deliberate rumination and with PTG. Deliberate rumination is positively associated with PTG. Moreover, social support is positively associated with the PTG. whereas; wellbeing is positively associated with PTG and its domains. Furthermore, subscales of PTG are positively correlated with each other.

Results support our first hypothesis that both the subjective and objective appraisal to flood is positively associated with psychological distress, PTS, intrusive and deliberate rumination and negatively associated with the wellbeing and life satisfaction. Results also partially supported our second hypothesis that psychological distress is positively associated with PTS, intrusive rumination, deliberate rumination; while negatively associated with social support, life satisfaction, and psychological wellbeing. However, quite contrary to our second hypothesis results showed that distress was not negatively associated with the PTG. Results also supported our third hypothesis that PTS

will be positively associated with psychological distress, intrusive ruminations, deliberate ruminations, and PTG; while negatively associated with life satisfaction and psychological wellbeing among flood affected individuals. Similarly our fourth hypothesis is also supported that intrusive rumination would be more likely to be positively associated with the psychological distress, PTS, deliberate rumination and negatively associated with the life satisfaction and psychological wellbeing. In addition, we found the deliberate rumination would be positively associated with intrusive rumination and PTG that supports our hypothesis number five. Moreover, we found that Intrusive rumination would more likely be strongly associated with PTS, while deliberate rumination would more likely be strongly associated with PTG. That's supports our sixth hypothesis. Besides, our seventh hypothesis is partially supported, as we hypothesized that social support is expected to be positively associated with life satisfaction, PTG, and well-being, and negatively associated with PTS and psychological distress. As we found the social support was positively associated with the PTS.

Table 20*Correlation of the Demographic Variables with the Main Study Variables (N=1879)*

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1 Age	28.25	9.59	-	.13**	.38**	-.15**	-.10**	-.07**	-.02	-.07**	-.01	.12**	-.08**
2 Education	13.26	1.86		-	.27**	-.12**	-.25**	-.19**	-.12**	-.01	.06**	.09**	-.04
3 Income	14.65	12.44			-	-.18**	-.22**	-.23**	-.18**	.06	.13**	.19**	-.10**
4 Psychological distress	21.08	12.60				-	.55**	.57**	.38**	-.07**	-.12**	-.61**	.08**
5 PTS	34.21	17.43					-	.75**	.62**	.06*	-.07**	-.31**	.31**
6 Intrusive rumination	14.30	7.58						-	.65**	.01	-.10**	-.41**	.26**
7 Deliberate rumination	16.95	7.07							-	.14**	.03	-.16**	.42**
8 Social support	59.97	15.70								-	.53**	.28**	.46**
9 Satisfaction with Life	22.92	6.94									-	.36**	.42**
10 Wellbeing	22.06	6.46										-	.22**
11 Posttraumatic growth	30.15	9.71											-

Note. PTS = Posttraumatic Stress.* $p < .05$, ** $p < .01$

Table 20 shows the bivariate correlation of the demographic variables with the study variables. Results showed that age is significantly negatively associated with psychological distress, PTS, intrusive ruminations, perceived social support, and PTG whereas, it is positively associated with wellbeing. In addition, education is significantly negatively associated with psychological distress, PTS, intrusive rumination, and positively associated with life satisfaction and psychological wellbeing. Moreover, income has the negative relation with psychological distress, PTS, intrusive rumination, PTG while it is positively associated with life satisfaction and psychological wellbeing.

Our demographic hypotheses that we related to the education and income are partially supported. We hypothesized that age would be more likely to be negatively associated with psychological distress, PTS, intrusive rumination, deliberate rumination and PTG; while positively associated with the psychological wellbeing. This supports our eighth hypothesis. In addition, our ninth hypothesis that education would be more likely to be negatively associated with psychological distress, PTS, intrusive rumination, and positively associated with life satisfaction, PTG and psychological wellbeing is partially supported. The results showed that education was not significantly associated with the PTG. We also formulated this hypothesis that, income will be negatively associated with psychological distress, PTS, intrusive rumination, and positively associated with the social support, life satisfaction, psychological wellbeing, and PTG. Tenth hypothesis is also partially supported as the results showed that income was not significantly associated with the social support and negatively associated with the PTG. We were assuming the positive relationship of income and PTG. The possible reason could be that most of the studies that showed the positive relationship between education, socioeconomic status, and PTG are conducted with the cancer patients or the patients of the different illness, so with the community sample of natural disaster the relationship might be different.

Table 21
Relationship of Coping Styles with Posttraumatic Growth (N=1912)

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Self Distraction	5.28	1.58	-	.43**	.32**	.08**	.32**	.35**	.16**	.39**	.35**	.40**	.17**	.30**	.29**	.22**	.33*
2. Active Coping	6.07	1.63		-	.19**	-.07**	.42**	.19**	.02	.26**	.50**	.52**	-.02	.33**	.44**	.13**	.43**
3. Denial	4.57	1.70			-	.25**	.16**	.32**	.40**	.34**	.16**	.15**	.29**	.15**	-.02	.33**	.22**
4. Substance Use	3.08	1.67				-	-.05*	.25**	.36**	.23**	-.10**	-.08**	.35**	-.01	-.25**	.30**	-.06*
5. Use Instrument.	5.67	1.55					-	.35**	.07**	.26**	.42**	.45**	.06*	.31**	.37**	.16**	.38**
6. Use Emotional	4.42	1.75						-	.28**	.39**	.24**	.21**	.31**	.23**	.06**	.30**	.28**
7. Beh. Disengag.	4.86	1.57							-	.33**	0.04	0.04	.38**	.14**	-.06**	.36**	.12**
8. Venting	5.69	1.54								-	.25**	.28**	.32**	.29**	.08**	.39**	.24**
9. Positive Refr.	5.96	1.67									-	.52**	.08**	.37**	.37**	.17**	.40**
10. Planning	4.28	1.68										-	.06*	.44**	.52**	.15**	.44**
11. Humour	5.58	1.58											-	.16**	-.13**	.40**	.12**
12. Acceptance	6.76	1.52												-	.39**	.20**	.31**
13. Religion	4.74	1.54													-	-.03	.39**
14. Self Blame	4.62	1.78														-	.09**
15. PTG	30.15	9.71															-

Note. Use Instrument. =Use Instrumental Support; Beh. Disengage= Behaviour Disengagement; Positive Refr.= Positive Reframing; PTG = Posttraumatic Growth.

* $p < .05$, ** $p < .01$

Table 21 demonstrates the correlation between the subscales of Brief Cope and posttraumatic growth. The strongest Pearson productmoment correlation coefficient for the self-distraction coping is the active coping, planning, and positive reframing. Moreover, Active coping is negatively associated with the substance abuse coping. In addition, substance abuse coping is negatively associated with the positive reframing, planning, religion coping and posttraumatic growth. Religious coping is negatively associated with behavioural disengagement and humour coping respectively.

In addition, the strongest Pearson product moment correlation coefficient for the PTG is planning coping, active coping, positive reframing, and religious coping. Whereas, PTG was significantly negatively associated with the substance abuse coping. Besides, PTG is significantly positively associated with other coping strategies such as, self-distraction coping, denial coping, uses instrumental support coping, behavioural disengagement, venting coping, acceptance, and self-blame coping.

The results partially support our 11th hypothesis that, coping strategies such as active coping, positive reframing coping, planning coping, acceptance, use instrumental support, and religion coping are positively associated with PTG; while substance abuse coping, behaviour disengagement, humour, and self-blame coping will be negatively or not associated with PTG. Quite contrary to our hypothesis, we found that behaviour disengagement, humour, and self-blame coping are also positively associated the PTG. However, the strength of the relationship is low. Furthermore, the results gives the additional findings that PTG is significantly positively related to all forms of coping strategies that are mentioned in Brief Cope except the substance abuse coping.

Comparison of main study variables on Gender, Employment Status, Marital status, and Education

Independent sample *t*- test and one way *ANOVA* was used for the comparison of means scores among the study variables. Our second objective was to assess whether PTS, distress responses, rumination patterns, coping strategies, social support and PTG differ in male and female flood survivors. For that purpose to test respective hypotheses, the above mentioned analyses were performed.

Table 22

Gender differences on Distress Responses, Perceived Social Support, Rumination Patterns and Posttraumatic Growth (N = 1834)

Variables	Men (n = 1289)		Women (n = 545)		<i>t</i> (1832)	<i>p</i>	95 % CI		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			LL	UL	
Distress	20.58	12.75	22.22	12.18	2.66	.010	-2.85	-0.43	.13
Stress	7.96	4.38	8.79	4.28	3.90	.001	-1.25	-0.41	.19
Anxiety	5.91	4.70	6.28	4.45	1.61	.110	-0.81	0.08	.08
Depression	6.73	4.75	7.12	4.59	1.69	.090	-0.84	0.06	.08
PTS	33.20	17.60	36.54	16.82	3.89	.001	-5.02	-1.65	.19
Intru. Rumination	13.90	7.63	15.20	7.38	3.49	.001	-2.03	-0.57	.17
Deli. Rumination	16.90	7.08	17.08	7.07	.50	.620	-0.86	0.51	.02
Social support	59.49	15.84	61.11	15.34	2.09	.040	-3.14	-0.10	.10
Coping	71.32	12.43	72.12	11.60	1.31	.190	-2.00	0.40	.07
Wellbeing	22.46	6.54	21.15	6.17	4.13	.001	0.69	1.93	.21
PTG	29.77	9.79	31.03	9.48	2.64	.010	-2.20	-0.32	.13
Relating others	5.92	2.37	5.98	2.38	.50	.620	-0.29	0.17	.02
New possibilities	5.57	2.54	5.86	2.56	2.33	.020	-0.54	-0.05	.11
Personal strength	6.22	2.54	6.32	2.61	.75	.450	-0.34	0.15	.04
Spiritual changes	6.93	2.47	7.32	2.19	3.29	.001	-0.62	-0.16	.17
Life appreciation	5.15	2.71	5.57	2.62	3.21	.001	-0.68	-0.17	.16

Note. CI= Confidence Interval; PTS. Posttraumatic Stress; Intru. Rumination= Intrusive Rumination; Deli. Rumination= Deliberate rumination; PTG= Posttraumatic Growth.

To see the gender difference on study variables, independent sample *t*-test demonstrated a statistically significant difference at the $p < .05$ level in psychological distress for men and women. Results are presented in Table 22. Women scored higher as compared to men. To be more specific, women scored high in stress as compared to men. Women also scored high in posttraumatic stress as compared to men. Intrusive rumination was also higher in women as compared to men. Moreover, women perceived more social support as compared to men. Whereas, wellbeing was higher among men as compared to women. PTG was higher among women as compared to men. Moreover, to see difference on the subscales of PTG. Table 22 also showed that women scored higher in new possibilities in life, Spiritual and life appreciation domains of PTG as compared to men respectively. These results affirmed our hypothesis that women will more likely score high on, psychological distress, PTS, intrusive/deliberate ruminations, and PTG as compared to men. Hence, the results support our 12th hypothesis.

Table 23
Comparison of men and women in the use of Coping Strategies (N = 1831)

<i>Variables</i>	Men (n = 1251)		Women (n = 580)		<i>t</i> (1829)	<i>p</i>	95% CI		<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
Self-distraction	5.17	1.59	5.54	1.56	4.28	.01	-0.54	-0.20	.23
Active coping	6.00	1.66	6.23	1.49	2.56	.01	-0.40	-0.05	.14
Denial Coping	4.51	1.69	4.69	1.68	1.96	.05	-0.36	0.00	.11
Substance Use	3.12	1.67	2.84	1.56	3.14	.001	0.11	0.46	.17
Use instr. Support	5.63	1.55	5.76	1.54	1.55	.12	-0.30	0.04	.001
Beh. Disengagement	4.38	1.74	4.45	1.75	.72	.47	-0.26	0.12	.001
Venting	4.83	1.54	4.93	1.62	1.15	.25	-0.27	0.07	.001
Positive reframing	5.66	1.54	5.77	1.53	1.25	.21	-0.27	0.06	.001
Planning	5.95	1.70	6.00	1.64	.53	.59	-0.23	0.13	.001
Humour	4.40	1.71	4.10	1.59	3.24	.001	0.12	0.48	.18
Acceptance	5.53	1.59	5.71	1.61	1.97	.05	-0.35	0.00	.11
Religion	6.68	1.57	6.89	1.44	2.46	.01	-0.37	-0.04	.14
Self-blame	4.64	1.77	4.58	1.79	.58	.56	-0.14	0.25	.03
Use Emotional Support	4.69	1.52	4.75	1.56	.61	.54	-0.22	0.11	.001

Note. CI= Confidence Interval; Beh. Disengagement = Behavioural Disengagement, Use instr. Support = Use instrumental support

Table 23 showed that women scored significantly high in self-distraction coping as compared to men. Moreover, women scored higher on active and denial coping as compared to men. In substance abuse coping men scored high as compared to women. In addition, men scored high in humour coping and self-blame coping as compared to women. These findings partially supported our 13th hypothesis that females would more likely score high in instrumental support, self-blame, venting, denial and religion coping while men would more focus on positive reframing, substance abuse and humour coping.

Table 24

Differences on Distress Responses, Perceived Social Support, Rumination Patterns, and Posttraumatic Growth among Employed and Unemployed Individuals (N= 1722)

Variables	Employed (n=800)		Unemployed (n=922)		<i>t</i> (1720)	<i>p</i>	95% CI		Cohn's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			Lower	Upper	
Distress	18.51	11.91	22.91	12.69	7.65	.001	-5.52	-3.27	.36
Stress	7.45	4.25	8.81	4.37	6.74	.001	-1.75	-0.96	.31
Anxiety	5.22	4.35	6.56	4.70	6.31	.001	-1.75	-0.92	.29
Depression	5.88	4.38	7.53	4.77	7.71	.001	-2.07	-1.23	.36
PTS	30.11	16.33	37.08	17.50	8.75	.001	-8.54	-5.41	.41
Intrusive rumination	12.70	7.47	15.43	7.46	7.82	.001	-3.42	-2.05	.36
Deliberate rumination	16.12	7.39	17.59	6.78	4.44	.001	-2.11	-0.82	.21
Satisfaction with life	23.34	6.93	22.71	6.92	1.95	.05	0.00	1.27	.09
Social support	59.60	16.29	60.67	14.88	1.48	.14	-2.49	0.35	.00
Wellbeing	23.28	6.23	21.16	6.48	7.13	.001	1.53	2.70	.33
Posttraumatic growth	29.77	10.23	30.54	9.13	1.71	.09	-1.65	0.11	.08
Relating to others	5.92	2.38	5.98	2.37	.48	.63	-0.27	0.16	.00
New possibilities	5.55	2.58	5.74	2.49	1.57	.12	-0.42	0.05	.00
Personal strength	6.40	2.59	6.20	2.51	1.68	.09	-0.03	0.43	.08
Spiritual change	6.93	2.58	7.16	2.24	2.01	.04	-0.44	-0.01	.09
Life Appreciation	5.01	2.80	5.49	2.58	3.83	.001	-0.72	-0.23	.18

Note. CI= Confidence Interval

Table 24 shows that unemployed individuals scored high in psychological distress stress, anxiety, depression and posttraumatic stress symptoms as compared to employed individuals. In addition, Intrusive rumination was higher among unemployed individuals as compared to employed participants. Whereas, deliberate rumination was higher among unemployed individuals as compared to employed individuals. Moreover, individuals with unemployment, scored high in spiritual change as compared to individuals with employed individuals. Similarly, unemployed participants scored high in life appreciation as compared to employed individuals. These findings support 14th hypothesis that Individuals who have high income or employed would more likely score low on PTS,

stress, anxiety and depression. Moreover, findings supported this assumption that employed individuals would score high in life satisfaction and wellbeing.

Table 25

Difference of Coping Strategies among Employed and Unemployed Individuals (N=1751)

<i>Coping Styles</i>	Employed (n=818)		Unemployed (n=933)		<i>t</i> (1749)	<i>p</i>	95% CI		<i>Cohn's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			LL	UL	
Self distraction	5.02	1.61	5.46	1.55	5.25	.001	-0.60	-0.28	.28
Active coping	5.96	1.69	6.15	1.52	2.25	.02	-0.36	-0.02	.12
Denial	4.39	1.65	4.66	1.69	3.01	.001	-0.44	-0.09	.16
Substance use	3.05	1.64	3.00	1.64	.53	.60	-0.13	0.22	.001
Use instrumental sup	5.53	1.62	5.77	1.47	2.93	.001	-0.40	-0.08	.15
Behavioural diseng.	4.33	1.75	4.48	1.74	1.69	.09	-0.34	0.03	.08
Venting	4.72	1.60	4.98	1.52	3.20	.001	-0.43	-0.10	.17
Positive reframing	5.60	1.58	5.74	1.50	1.72	.09	-0.30	0.02	.09
Planning	5.82	1.78	6.07	1.58	2.88	.001	-0.43	-0.08	.15
Humour	4.33	1.71	4.30	1.67	.28	.78	-0.15	0.20	.001
Acceptance	5.53	1.65	5.63	1.55	1.16	.25	-0.26	0.07	.001
Religion	6.65	1.63	6.84	1.45	2.35	.02	-0.35	-0.03	.12
Self blame	4.54	1.76	4.69	1.77	1.57	.12	-0.33	0.04	.001
Use emotional Sup.	4.56	1.55	4.79	1.51	2.83	.001	-0.39	-0.07	.15

Note. Use instrumental sup= Use instrumental support; Behavioural diseng= Behavioural disengagement; Use emotional Sup.= Use emotional Support

Another objective of the study was to see the styles of coping used by employed and unemployed individuals. Table 25 showed that unemployed individuals significantly scored high on coping strategies such as self-distraction, active coping, denial coping, instrumental support, and venting coping as compared to employed individuals. While unemployed individuals scored significantly high in planning, religious coping, and use emotional support coping.

Table 26

Differences on Distress Responses, Perceived Social Support, Rumination Patterns and Posttraumatic Growth among Married and Unmarried Individuals (N=1785)

<i>Variables</i>	Unmarried (<i>n</i> = 947)		Married (<i>n</i> = 838)		<i>t</i> (1783)	<i>p</i>	95% CI		<i>Cohn</i> <i>'s d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
Psychological Distress	22.70	12.53	19.11	12.46	6.29	.001	2.47	4.71	.29
PTS	35.23	17.58	33.01	17.16	2.77	.01	0.65	3.78	.13
Intrusive rumination	14.78	7.36	13.72	7.86	3.05	.001	0.38	1.74	.14
Deliberate rumination	17.10	6.91	16.81	7.31	.89	.38	-0.35	0.93	.00
Social support	60.34	15.45	59.59	15.96	1.05	.30	-0.66	2.16	.00
Life satisfaction	22.87	6.88	22.96	7.04	.27	.79	-0.71	0.54	.00
Wellbeing	21.37	6.19	22.91	6.72	5.20	.001	-2.11	-.95	.24
Posttraumatic Growth	30.55	9.41	29.72	10.02	1.87	.06	-0.04	1.70	.08
Relating to others	5.96	2.36	5.93	2.39	.25	.81	-0.19	0.24	.00
New possibilities	5.78	2.51	5.50	2.60	2.35	.02	0.04	0.50	.11
Personal strength	6.25	2.53	6.26	2.60	.13	.90	-0.24	0.22	.00
Spiritual change	7.12	2.30	6.97	2.49	1.37	.17	-0.06	0.36	.06
Life appreciation	5.47	2.65	5.06	2.71	3.34	.001	0.17	0.65	.15

To see the difference of psychological distress, PTS, rumination patterns, social support, life satisfaction, wellbeing and PTG among married and unmarried individuals. Table 26 showed that unmarried individuals scored high in psychological distress, posttraumatic stress symptoms and intrusive ruminations as compared to married individuals. Married individuals scored high on the psychological wellbeing. In addition, unmarried individuals scored high in New Possibilities and life appreciation as compared to married individuals. However, on all the other subscales of PTG, there was non-significant difference. Quite contrary to 14th hypothesis, results showed non significant

differences on the variables of PTG among married and unmarried individuals. Whereas, our hypothesis that individuals who are married are more likely to score low on psychological distress, PTS and high on PTG, is partially supported.

Table 27

Difference of Coping Strategies among Married and Unmarried Individuals (N=1787)

<i>Coping Strategies</i>	Unmarried (n=944)		Married (n=843)		<i>t</i> (1785)	<i>p</i>	95% CI		<i>Cohn's</i> <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
Self-distraction	5.45	1.56	5.07	1.62	4.57	.001	0.22	0.54	.24
Active coping	6.09	1.59	6.06	1.64	0.45	.65	-0.13	0.20	.02
Denial	4.66	1.70	4.43	1.67	2.61	.01	0.06	0.40	.14
Substance use	3.10	1.70	2.95	1.56	1.77	.08	-0.02	0.32	.09
Use instrumental sup.	5.69	1.54	5.68	1.57	0.03	.98	-0.16	0.16	.001
Behavioural disengage.	4.51	1.75	4.29	1.75	2.39	.02	0.04	0.40	.12
Venting	4.94	1.61	4.75	1.52	2.38	.02	0.03	0.36	.12
Positive reframing	5.73	1.51	5.66	1.58	0.89	.37	-0.09	0.23	.04
Planning	5.98	1.61	5.98	1.76	0.05	.96	-0.17	0.18	.00
Humour	4.39	1.71	4.19	1.64	2.24	.03	0.02	0.37	.12
Acceptance	5.63	1.59	5.56	1.61	0.92	.36	-0.09	0.24	.04
Religion	6.75	1.50	6.76	1.57	-0.05	.96	-0.16	0.15	.001
Self-blame	4.71	1.81	4.51	1.74	2.18	.03	0.02	0.39	.11
Use emotional support	4.83	1.55	4.56	1.51	3.42	.001	0.12	0.43	.18

Note. Behavioural disengage.= Behavioural disengagement

Another objective of the study was to see the difference of coping strategies among married and unmarried individuals; Table 27 showed the difference of coping strategies used by married and unmarried individuals. Unmarried individuals scored significantly high in the coping strategies of self-distraction coping, denial coping, behavioural disengagement, venting coping, humour coping, self-blame and use of emotional support and as compared to married individuals.

Table 28

Age difference in the level of Flood Exposure, Distress Responses, Rumination Patterns, Social support, Life Satisfaction, and Posttraumatic Growth (N= 1881)

<i>Variables</i>	Adolescents (<i>n</i> =406)		Adults (<i>n</i> =1170)		Older Adults (<i>n</i> = 305)		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Flood exposure	17.60	9.97	16.32	9.89	14.24	9.38	10.09	.001	.015
Psychological Distress	24.76	12.37	22.14	12.67	17.63	11.74	28.68	.001	.040
Posttraumatic stress	38.74	16.30	35.40	17.55	31.51	17.65	13.24	.001	.037
Intrusive rumination	15.74	7.12	14.41	7.47	13.11	7.94	8.93	.001	.013
Deliberate rumination	16.97	6.44	17.16	7.00	16.64	7.66	.74	.48	-
Social support	61.70	13.49	60.87	15.57	58.82	16.40	3.23	.04	.004
Satisfaction with life	23.57	6.61	22.81	6.65	23.13	7.37	1.06	.35	-
Posttraumatic growth	30.43	8.70	30.83	9.29	28.92	10.53	5.48	.001	.001
Relating to others	5.74	2.44	6.04	2.29	5.88	2.49	1.51	.22	-
New possibilities	5.78	2.43	5.85	2.46	5.20	2.67	9.23	.001	.013
Personal strength	6.13	2.45	6.42	2.44	5.98	2.72	4.35	.01	.006
Spiritual change	7.29	2.05	7.12	2.30	6.99	2.60	1.20	.30	-
Life Appreciation	5.53	2.64	5.43	2.62	4.95	2.89	5.12	.01	.007

Note. *df*= 2, 1878

Table 28 showed the difference of exposure to flood, PTS, psychological distress, intrusive rumination, deliberate rumination, perceived social support, life satisfaction, and PTG among adolescent, adults, and older adults. *ANOVA* was computed to see the age related differences. Results showed that adolescents scored high as compared to adults and older adults in level of flood exposure and the difference is significant. Likewise, adolescents also scored high on psychological distress as compared to adults and older adults and the difference is significant. In the same line, adolescents also scored high on posttraumatic stress and intrusive rumination as compared to adults and older adults. Adolescents scored high on perceived social support as compared to adults and older adults. Moreover, adolescents scored significantly high on posttraumatic growth, new possibilities, personal strength, and life appreciation.

The results supported our assumption that younger individuals are more likely than older individuals to score high on PTS, psychological distress, and PTG. However, our 15th hypothesis that older survivors reported more enhanced spirituality as compared to adolescents and adults is not supported. To see the difference between the groups, Posthoc analysis was computed. The posthoc analysis has been reported in Table 29.

Table 29

Posthoc analysis of Age difference in the level of Flood Exposure, Distress Responses, Ruminations Patterns and Posttraumatic growth (N= 1881)

Variables	(I) Age Categories	(J) Age Categories	Mean Difference (I-J)	(i-j)	S.E	LL	UL
Flood exposure	Adolescents	Adults	adolescents>older adults	3.35***	0.83	1.37	5.33
	Adults	Older adults	Adults> older adults				
Distress	Adolescents	Adults	adolescents> adults	2.62*	0.96	0.31	4.94
		Older adults	adolescents>older adults	7.13***	1.05	4.62	9.64
	Adults	Older adults	Adults> older adults	4.51**	0.75	2.72	6.29
PTS	Adolescents	Adults	adolescents> adults	3.34*	1.36	.07	6.61
		Older adults	adolescents>older adults	7.23***	1.48	3.68	10.78
	adults	Older adults	Adults> older adults	3.89**	1.08	1.36	4.42
Intrusive Rumination	Adolescents	Older adults	adolescents>older adults	2.63***	0.64	1.09	4.17
	adults	Older adults	Adults> older adults	1.30**	0.46	0.20	2.40
Posttraumatic Growth	adults	Older adults	Adults> older adults	1.91**	0.58	0.52	3.31
New Possibilities	Adolescents	Older adults	adolescents>older adults	0.58*	0.21	0.06	1.09
	Adults		Adults> older adults	0.64***	0.15	0.28	1.00
Personal Strength	Adults	Older adults	Adults> older adults	0.44**	0.15	0.07	0.80
Life Appreciation	Adolescents	Older adults	adolescents>older adults	0.58*	0.23	0.03	1.13
	adults		Adults> older adults	0.47*	0.16	0.08	0.87

Note. * $p < .05$, ** $p < .01$.

Analysis of variance showed a statistically significant difference at the $p < .05$ level in exposure to flood scores for the three age groups: $F(2, 1878) = 10.09, \eta^2 = .01$. Post-hoc analysis using the Bonferroni test indicated that the mean score for adolescents was significantly different from adults and adults significantly differed from the older adults. For psychological distress, post-hoc comparisons test indicated that the mean

score for adolescents was significantly different from adults and the older adults: $F = 28.68, p < .001, \eta^2 = .04$. Likewise, we found a significant difference in PTS for the three age groups: $F = 13.34, \eta^2 = .001$. Post-hoc comparisons using the Bonferroni test indicated that the mean score for adolescents was significantly different from adults and from the older adults.

In addition, results showed a statistically significant difference in intrusive rumination for the three age groups. Post-hoc comparisons showed that the mean score for adolescents was significantly different from older adults and adults were significantly different from the older adults: $F = 8.93, p < .001, \eta^2 = .013$. On the variable of PTG, results showed a statistically significant difference for the three age groups: Post-hoc comparisons showed that the mean score for adolescents was significantly different from older adults: $F = 5.48, \eta^2 = .013$. Besides, results showed a statistically significant difference in new possibilities that is the domain of PTG for the three age groups: $F = 9.23, p < .001, \eta^2 = .013$. Post-hoc analysis indicated that the mean score for adolescents and adults were significantly different from the older adults.

On the domain of personal strength, a statistically significant difference was found for the three age groups: $F = 4.35, p < .001, \eta^2 = .006$. Post-hoc comparisons showed that the mean score for adolescents was significantly different from older adults. Moreover, a statistically significant difference was found in life appreciation that is the domain of PTG for the three age groups: $F = 5.12, p < .001, \eta^2 = .007$. Post-hoc comparisons using the Bonferroni test indicated that the mean score for adolescents and adults were significantly different from the older adults. These results support our hypothesis that younger individuals are more likely than older individuals to report PTS, Psychological distress and PTG.

Table 30
Comparison of Coping Strategies across Age Groups (N=1823)

Variable	adolescents (n =401)		Adults (n =1121)		Older Adults (n =301)		F	p	η^2
	M	SD	M	SD	M	SD			
Self distraction	5.44	1.51	5.42	1.60	4.96	1.60	12.38	.001	.018
Active coping	6.18	1.46	6.12	1.60	6.15	1.67	0.12	.884	-
Denial	4.72	1.67	4.70	1.73	4.10	1.63	17.31	.001	.026
Substance use	2.98	1.68	3.02	1.66	2.98	1.61	.10	.909	-
Use instrumental support	5.61	1.54	5.74	1.53	5.67	1.58	.69	.501	-
Behavioural disengagement	4.36	1.82	4.51	1.74	4.12	1.72	6.44	.002	.007
Venting	4.84	1.59	4.96	1.60	4.70	1.51	3.55	.029	.005
Positive reframing	5.55	1.53	5.77	1.51	5.67	1.60	1.63	.196	-
Planning	5.89	1.56	6.03	1.64	6.00	1.74	.53	.586	-
Humour	4.17	1.73	4.42	1.67	3.95	1.66	10.61	.001	.015
Acceptance	5.60	1.56	5.61	1.59	5.54	1.59	.27	.761	-
Religion	6.73	1.35	6.80	1.51	6.90	1.52	1.10	.332	-
Use emotional support	4.99	1.50	4.83	1.53	4.53	1.52	7.70	.001	.011
Self-blame	4.75	1.77	4.70	1.85	4.37	1.66	5.07	.006	.007

df=2, 1820

Table 30 showed the difference of coping strategies employed by three groups (i.e., adolescents, adults, and older adults). Results showed that self-distraction, denial, behavioural disengagement, venting, humour, use emotional support, and self-blame coping are different among three groups. To see the differences between three groups, Post-hoc analysis was computed. The post-hoc results can be seen in Table 31.

Table 31
Post-hoc Analysis of Age related differences on Coping Strategies across Age (N=1823)

Variables	(I) Age Categories	(J) Age Categories	Mean Difference (I-J)	(i-j)	S.E	LL	UL
Self-distraction	Adolescents	Older adults	adolescents>older adults	0.48**	0.14	0.15	0.81
	Adults	Older adults	Adults> older adults	0.47**	1.00	0.23	0.70
Denial Coping	Adolescents	Older adults	adolescents>older adults	0.61***	0.15	0.26	0.98
	Adults	Older adults	Adults >older adults	0.60***	1.05	0.34	0.85
Behavioural disengaged	Adults	Older adults	Adults >older adults	0.39**	0.11	0.13	0.65
Venting	Adults	Older adults	Adults> older adults	0.26*	0.10	0.02	0.50
Humour	Adolescents	Older adults	Adolescents >older adults	0.47*	0.10	0.22	0.72
	Adults	Older adults	Adults> older adults	1.30**	0.46	0.20	2.40
Use emotional support	Adolescents	Older adults	adolescents>older adults	0.36**	0.13	0.15	0.78
	Adults	Older adults	Adults> older adults	0.30**	0.09	0.07	0.53
Self-blame	Adolescents	Older adults	adolescents >older adults	0.37*	0.15	0.00	0.75
	Adults	Older adults	Adults >older adults	0.33**	0.11	0.06	0.59

* $p < .05$, ** $p < .01$

In Table 31, Analysis of variance showed a statistically significant difference at the $p < .05$ level in self-distraction coping for the three age groups: $F(2,1820) = 12.38$, $p < .001$, $\eta^2 = .02$. Post-hoc comparisons using the Bonferroni test indicated

that the mean score for adolescents was significantly different from older adults. Besides, the mean scores of the adults were significantly different from the older adults. Besides, there is a statistically significant difference in denial coping for the three age groups: $F = 17.31, p < .001, \eta^2 = .026$. Post-hoc test indicated that the mean score for adolescents was significantly different from older adults and the adults group differed significantly from the older adults. Moreover, there is also a statistically significant difference at ($p < .05$) level in behavioural disengagement for the three age groups: $F = 6.04, p < .01, \eta^2 = .007$. Post-hoc analysis indicated that the mean score for adults was significantly different than older adults.

Furthermore, results showed a statistically significant difference in venting coping for the three age groups: $F = 3.55, \eta^2 = .029$. Post-hoc comparisons depicted that the mean score for adults was significantly different than older adults. Results also showed a statistically significant difference in humour coping: $F = 10.61, p < .001, \eta^2 = .015$. Post-hoc indicated that the mean score for adolescents and adults were significantly different from the older adults. Besides, a statistically significant difference was found in emotional support coping for the three age groups: $F = 7.70, p < .001, \eta^2 = .011$. Post-hoc analysis showed that the mean score for adolescents and adults were significantly different from the older adults. A significant difference in Self-blame coping was found for the three age groups: $F (2, 1821) = 5.07, p < .001, \eta^2 = .007$. Post-hoc comparisons exhibited that the mean score for adolescents and adults were significantly different from the elderly individuals.

Predictors of Posttraumatic Stress and Posttraumatic Growth

To see the predictors of PTS and PTG multiple hierarchical regression analysis was done. We conducted the hierarchical regression analysis because PTG theory and previous literature has proposed the predictors of PTG (Meyerson et al., 2011). So we entered the predicting variables in the model according to their predicting role.

Table 32

Summary of Hierarchical Regression Analysis for Variables Predicting Posttraumatic Growth (N = 1884)

Variable	Self-Reported Posttraumatic Growth			
	Model 1B	Model 2B	Model 3	95 % CI
(Constant)	27.99***	5.77*	-3.25	[-7.93, 1.43]
Gender	.81**	.70	.56	[-.23, 1.35]
Age	-.06	-.05	-.07*	[-.12, -.02]
Education	.00	-.14	.13	[-.08, .34]
Marital status	-.16	-.24	-.31	[-1.17, .56]
Employment status	.00	.31	-.20	[-1.02, .61]
Flood exposure	.19***	.24***	.09***	[.04, .13]
Social support		.16***	.12***	[.10, .15]
Satisfaction with life		.36***	.37***	[.31, .43]
Wellbeing		.21***	.30***	[.22, .38]
Deliberate rumination			.37***	[.30, .44]
Intrusive rumination			.10*	[.02, .18]
Posttraumatic Stress			.07***	[.03, .10]
Psychological Distress			-.01	[-.06, .03]
R^2	.05	.31	.43	
F	13.62***	83.42***	97.88***	
ΔR^2		.26	.12	
ΔF		212.70	90.36	

Note. CI= Confidence interval. * $p < .05$, *** $p < .001$

Table 32 shows that a three stage hierarchical multiple regression was conducted with PTG as the dependent variable. Demographic variables (i.e., gender, age, education, marital status, employment status, and level of exposure to flood) were entered at stage one of the regression to control for their effect. Potentially

confound variables (social support, life satisfaction, and wellbeing) were entered at stage two for controlling their effect and lastly, predictors of posttraumatic growth such as deliberate rumination, Intrusive rumination, PTS and Distress were entered at stage three.

The hierarchical multiple regression revealed that at stage one, from demographic variables only the level of exposure to flood contributed significantly to the PTG to the regression model, $F(6, 1878) = 13.62, p < .001$ and accounted for .05 % of the variation in PTG. Introducing the potentially confounding variables explained an additional 26 % of variation in PTG and this change in R^2 was significant, $F(13, 1871) = 83.42, p < .001$. Adding the predictors to the regression model (intrusive rumination, deliberate rumination, PTS, and distress) explained an additional 12% of the variation in PTG and this change in R^2 was significant, $F(13, 1884) = 97.88, p < .001$. When all four independent variables were included in stage three of the regression model, distress was no longer significant predictor of PTG. Together the thirteen independent variables accounted for 43% of the variance in PTG. Results also supports the 16th hypothesis that deliberate rumination would be the strongest predictors of PTG.

Moreover, findings supported the hypothesis that best predictors of PTG would be higher degree of flood-related exposure, social support, life satisfaction, wellbeing, intrusive rumination, deliberate rumination, and PTS. Moreover, the deliberate rumination is the strongest predictor of PTG.

Table 33

Summary of Hierarchical Regression Analysis for Coping Strategies as Predicting Posttraumatic Growth (N=1864)

Variable	Self-reported Posttraumatic Growth		
	Model 1B	Model 2	95 % CI
(Constant)	29.22	.45	[-4.85, 5.76]
Gender	.67***	.21	[-.71, 1.13]
Age	-.07	-.07	[-.13, -.01]
Education	-.12	.10	[-.14, .34]
Marital status	.04	.09	[-.97, 1.15]
Employment status	.11	-.39	[-1.33, .54]
Flood exposure objective	.28***	.17	[.08, .26]
Active coping		.65***	[.67, 1.34]
Denial		.55***	[.27, .83]
Substance use		-.27	[-.55, .02]
Use instrumental support		.54**	[.21, .86]
Positive reframing		.58**	[.23, .92]
Planning		.82***	[.48, 1.15]
Humour		.52***	[.24, .81]
Religion		.99***	[.65, 1.33]
Use emotional support		.85***	[.54, 1.17]
Self-blame		-.61***	[-.87, -.34]
R^2	.06	.35	
F	12.47***	45.47***	
ΔR^2		.29	
ΔF		64.79	

Note. CI= confidence interval. * $p < .05$, ** $p < .001$

In Table 33, a two stage hierarchical multiple regression was conducted with Posttraumatic growth as the dependent variable. Demographic variables (i.e., gender, age, education, marital status, employment status, and level of exposure to flood) were entered at stage one of the regression model to control effect of these variables. Coping strategies (positive reframing, active coping, planning, denial, religion, substance use, use emotional support, humour, use instrumental support, and self-blame) at stage two.

The hierarchical multiple regression revealed that at stage one, from demographic variables gender and the level of exposure to flood contributed significantly to the PTG to the regression model, $F(6,1858) = 12.47$, $p < .001$ and accounted for .06 % of the variation in PTG. Adding the coping strategies to the

regression model explained an additional 29% of the variation in PTG and this change in R^2 was significant, $F(16, 1848) = 45.47, p < .001$. Together the sixteen independent variables accounted for 35% of the variance in PTG.

The results supports the 17th hypothesis that self-blame coping and substance abuse coping would negatively predict the PTG, and planning, positive reframing, acceptance, and religious coping would positively predict the PTG.

Table 34

Summary of Hierarchical Regression Analysis for Coping Strategies as Predicting Psychological Distress

Variable	Model 1B	Self-Reported Psychological Distress	
		Model 2	95 % CI
(Constant)	36.87**	2.73*	[31.79, 41.94]
Gender	.18	.71	[-1.17, 1.52]
Age	-.14**	-.06	[-.23, -.05]
Year of Education	.68**	-.67**	[-1.01, -.34]
Marital status	-.2.14**	-1.46*	[-3.69, .59]
Self-distraction		.90**	[.55, 1.26]
Denial		.97**	[.63, 1.31]
Substance use coping		.89**	[.56, 1.23]
Behavioural disengagement		1.50	[1.17, 1.84]
Venting		1.14	[.76, 1.52]
Humour		.52**	[.17, .87]
Self-Blame		.85**	[.52, 1.17]
R^2	.04	.37	
F	18.63**	88.60**	
ΔR^2		.33	
ΔF		122.99	

Note. $N=1883$. CI= confidence interval. * $p < .05$, ** $p < .01$

Table 34 shows the results of a two stage hierarchical multiple regression that was conducted to see the predictors of psychological distress that was taken as a dependent variable. At stage one to control the effect of demographic variables; gender, age, education, and marital status were entered in the regression model. After that, predictors of psychological distress such as self-distraction, substance use coping, denial, venting, behavioural disengagement, humour, and self-blame) were

entered at stage two. The hierarchical multiple regression depicted that at stage one, from demographic variables only the education, age, and marital status significantly contributed to the psychological distress to the regression model, $F(4, 1879) = 18.63$, $p < .01$) and accounted for .04 % variance in psychological distress. Adding the predictors to the regression model explained an additional 33 % of the variance in psychological distress and this change in R^2 was significant, $F(11, 1872) = 88.60$, $p < .001$. Together the eleven independent variables accounted for 37 % of the variance in psychological distress

Table 35

Hierarchical Regression Analysis for Coping Variables Predicting Posttraumatic Growth (N=1880)

Variable	Model 1B	Self-Reported Posttraumatic Growth	
		Model 2 2B	95 % CI
(Constant)	32.70***	1.35	[28.68, 36.71]
Gender	.82	.11	[-.24, 1.89]
Age	-.07*	-.08*	[-.15, -.01]
Year of Education	-.13	.22*	[-.40, .12]
Marital status	.27	.16	[-.94, 1.49]
Active Coping		.98**	[.66, 1.30]
Use instrumental Support		.99**	[.72, 1.34]
Positive reframing		.71**	[.38, 1.04]
Planning		.83**	[.50, 1.16]
Religious coping		.81**	[.47, 1.14]
Acceptance coping		.34*	[.06, .64]
R^2	.01	.31	
F	3.33*	71.94**	
ΔR^2		.30	
ΔF		116.73	

CI= confidence interval. * $p < .05$, ** $p < .01$

Table 35 illustrates the results of the hierarchical multiple regressions. A two stage hierarchical multiple regressions were conducted with self-reported PTG as the dependent variable. At stage one, to control the effect of demographic variables in the

regression model the gender, age, education, and marital status were entered. Then, the predictors of PTG such as active coping, positive reframing, use instrumental support coping, religious coping, planning, and acceptance coping were entered at stage two. The hierarchical multiple regression demonstrated that at stage one, from demographic variables only age significantly contributed to the PTG to the regression model, $F(4, 1876) = 3.33, p < .01$) and accounted for .01 % of the variance in PTG. Adding the predictors to the regression model explained an additional 30 % of the variance in PTG and this change in R^2 was significant, $F(10, 1870) = 71.94, p < .001$. Together all the independent variables accounted for 31 % of the variance in PTG.

Examining the Moderating Role of Demographic Variables

Moderating role of age, education, social support, flood appraisal subjective and objective were examined. Interaction effects of the age, education, social support, level of subjective and objective flood appraisal were made with Stress, Anxiety, Depression, PTS, intrusive rumination, deliberate rumination and coping strategies for the prediction of posttraumatic growth. PROCESS macro model 1 (simple moderation) (Hayes, 2013) was used to see the interaction effects. Before entering these variables in the equation, mean centering was done. Interaction term (Aiken & West, 1991), the two predictors and the interaction were entered into a simultaneous regression model. Preliminary data screening did not suggest problems with assumptions of normality and linearity.

Table 36

Interaction Effect of the Objective Flood Exposure with the Stress, PTS, Intrusive, and Deliberate Rumination for Predicting Posttraumatic Growth (N=1908)

<i>Interaction Effects</i>	<i>b</i>	<i>SE</i>	<i>p</i>	<i>LL</i>	<i>UL</i>
Constant	30.35	0.23	.001	29.91	30.80
Flood Exposure Objective	0.33	0.04	.001	0.25	0.41
Stress (centered)	0.11	0.06	.06	0.01	0.23
FEOX Stress	-0.02	0.09	.04	-0.03	-0.01
$R^2 = .05$					
Constant	30.58	0.21	.001	30.15	30.99
Flood Exposure Objective	0.21	0.04	.001	0.137	0.282
PTS	0.15	0.01	.001	0.12	0.17
FEOX PTS	-0.09	0.02	.001	-0.02	-0.01
$R^2 = 12$					
Constant	30.42	0.22	.001	29.99	30.25
Flood Exposure Objective	0.23	0.04	.001	0.16	0.31
Intrusive rumination	0.27	0.03	.001	0.20	0.33
FEO X Intrusive rumination	-0.02	0.01	.01	-0.03	-0.01
$R^2 = .09$					
Constant	30.29	0.20	.001	29.89	30.79
Flood Exposure Objective	0.15	0.03	.001	0.08	0.21
Deliberate rumination	0.53	0.03	.001	0.46	0.60
FEO X Deliberate rumination	-0.01	0.01	.01	-0.02	-0.02
$R^2 = .19$					

FEO = Flood Exposure Objective

Note. $df = 3, 1904$

Table 36 depicted that moderating role of objective exposure to flood in the relationship between studied variables and PTG. Interaction effect of Stress and objective flood exposure for the prediction of PTG is significant. When objective flood exposure is low, there are significant positive relationships between stress and PTG, $b = 0.22$, 95 % CI [0.05, 0.39], $t = 2.52$, $p = .012$. At the mean value of FEO, there is non-significant positive relationship between Stress and PTG, $b = 0.113$, 95 % CI [-0.01, 0.07], $t = 1.84$, $p = .065$. In addition, when FEO is high there is non-significant positive relationship between Stress and PTG, $b = 0.01$, 95 % CI [-0.14, 0.15], $t = 0.05$, $p = .96$. The interaction effect of PTS and flood exposure objective is also significant. When FEO is low, there is significant positive relationships between PTS and PTG, $b = 0.20$, 95 % CI [0.17, 0.24], $t = 10.68$, $p = .001$. At the mean value of FEO, there is significant positive relationship between PTS and PTG, $b = 0.15$, 95 %

CI [0.12, 0.17], $t = 10.32$, $p = .001$. When FEO is high there is significant positive relationship between PTS and PTG, $b = 0.09$, 95 % CI [0.05, 0.13], $t = 4.71$, $p = .001$. Interaction of FEO with the Intrusive and Deliberate rumination is significant. At the three levels of the moderator variable (low, mean and at high) there is significant positive relationship between rumination and PTG. This supports our 18th hypothesis.

Table 37

Interaction effect of the Subjective Exposure to Flood with the Stress, Depression, PTS, Intrusive, and Deliberate Rumination for Predicting Posttraumatic Growth (N=1982)

<i>Interaction Effects</i>	<i>b</i>	<i>SEB</i>	<i>p</i>	<i>LL</i>	<i>UL</i>
Constant	30.34	0.23	.001	29.89	30.79
Flood Exposure Subjective	0.26	0.05	.001	0.16	0.35
Stress (centered)	0.19	0.06	.01	0.06	0.31
FES X Stress	-0.02	0.01	.054	-0.04	-0.01
$R^2 = .03$					
Constant	30.33	0.22	.001	29.89	30.76
Flood Exposure Subjective	0.35	0.05	.001	0.26	0.44
Depression	-0.04	0.05	.41	-0.15	0.06
FES X Depression	-0.02	0.01	.04	-0.04	-0.01
$R^2 = .03$					
Constant	30.64	0.21	.001	30.21	31.06
Flood Exposure Subjective	0.09	0.05	.054	0.01	0.18
Posttraumatic stress (PTS)	0.17	0.01	.001	0.14	0.19
FES X PTS	-0.01	0.01	.001	-0.02	-0.01
$R^2 = .11$					
Constant	30.51	0.22	.001	30.07	30.94
Flood Exposure Subjective	0.15	0.05	.01	0.05	0.24
Intrusive rumination	0.29	0.03	.001	0.23	0.36
FES X Intrusive rumination	-0.02	0.01	.001	-0.04	-0.01
$R^2 = .08$					
Constant	30.35	0.21	.001	29.95	30.75
Flood Exposure Subjective	0.04	0.04	.37	0.05	0.13
Deliberate rumination	0.56	0.03	.001	0.49	0.63
FES X Deliberate rumination	-0.02	0.01	.01	-0.03	-0.01
$R^2 = .18$					

FES = Flood Exposure Subjective

Note. $df = 3, 1978$

Table 37 illustrates the moderating role of subjective exposure to flood (FES) in the relationship between studied variables and posttraumatic growth. Interaction effect of Stress and FES for the prediction of PTG is significant. When FES is low,

there are significant positive relationships between stress and PTG, $b = 0.29$, 95 % CI [0.11, 0.38], $t = 3.19$, $p = .012$. At the mean value of FES, there is significant positive relationship between Stress and PTG, $b = 0.19$, 95 % CI [0.06, 0.31], $t = 3.02$, $p < .01$. In addition, when FES is high there is non-significant positive relationship between Stress and PTG, $b = 0.08$, 95 % CI [-0.06, 0.22], $t = 1.08$, $p = .282$. The interaction effect of Anxiety and FES is also significant. When FES is low, there is non-significant relationships between Depression and PTG, $b = 0.05$, 95 % CI [0.10, 0.21], $t = 0.68$, $p = .494$. At the mean value of FES, there is non-significant negative relationship between Depression and PTG, $b = 0.04$, 95 % CI [0.15, 0.06], $t = .82$, $p = .410$ and when FES is high there is significant negative relationship between Depression and PTG, $b = 0.14$, 95 % CI [-0.27, 0.02], $t = 2.25$, $p < .02$.

In the same way interaction of FES with PTS is significant. When FES is low, there are significant positive relationships between PTS and PTG, $b = 0.23$, 95 % CI [0.19, 0.27], $t = 11.05$, $p = .001$. At the mean value of FES, there is significant positive relationship between PTS and PTG, $b = 0.17$, 95 % CI [0.14, 0.19], $t = 11.50$, $p < .001$ and when FES is high there is significant positive relationship between PTS and PTG, $b = 0.10$, 95 % CI [-0.07, 0.14], $t = 4.73$, $p < .001$. Moreover, the interaction of FES with intrusive rumination is significant. When FES is low, there are significant positive relationships between intrusive rumination and PTG, $b = 0.42$, 95 % CI [0.32, 0.51], $t = 8.53$, $p < .001$. At the mean value of FES, there is significant positive relationship between intrusive rumination and PTG, $b = 0.39$, 95 % CI [0.23, 0.35], $t = 8.47$, $p < .001$ and when FES is high there is significant positive relationship between intrusive rumination and PTG, $b = 0.17$, 95 % CI [-0.08, 0.27], $t = 3.63$, $p = .001$. To see the interaction effect of FES with deliberate rumination, When FES is low, there are significant positive relationships between deliberate rumination and PTG, $b = 0.66$, 95 % CI [0.57, 0.75], $t = 13.93$, $p = .001$. At the mean value of FES, there is significant positive relationship between deliberate rumination and PTG, $b = 0.56$, 95 % CI [0.49, 0.63], $t = 16.27$, $p < .001$. When FES is high there is significant positive relationship between Deliberate rumination and PTG, $b = 0.46$, 95 % CI [0.37, 0.56], $t = 9.41$, $p = .001$. Findings from Table 36 and 37 supports our 18th hypothesis that nature of flood exposure (subjective or objective) would moderate the relationship

between Stress and PTG; PTS and PTG, Intrusive and Deliberate Rumination and PTG.

Table 38

Interaction effect of the Age with the Coping Strategies for the predicting Posttraumatic Growth (N=1985)

<i>Interaction Effects</i>	<i>b</i>	<i>SEB</i>	<i>p</i>	<i>LL</i>	<i>UL</i>
Constant	30.20	0.21	.001	29.79	30.61
Age	-0.09	0.02	.001	0.13	0.04
Positive Reframing	2.52	0.15	.001	2.32	2.82
Age X Positive Reframing	0.04	0.01	.003	0.01	0.07
$R^2 = .17$					
Constant	30.20	0.22	.001	29.78	30.63
Age	-0.04	0.02	.08	0.08	0.01
Self Distraction	2.04	0.15	.001	1.75	2.34
Age X Self distraction	0.05	0.02	.003	0.02	0.08
$R^2 = .12$					
Constant	30.13	0.21	.001	29.72	30.54
Age	-0.09	0.02	.001	-0.13	-0.05
Active Coping	2.54	0.14	.001	2.26	2.81
Age X Active coping	0.05	0.01	.001	0.02	0.07
$R^2 = .19$					
Constant	30.15	0.21	.001	29.75	30.55
Age	-0.09	0.02	.001	-0.13	-0.04
Planning	2.54	0.14	.001	2.27	2.81
Age X Planning	0.03	0.01	.033	0.01	0.54
$R^2 = .20$					
Constant	30.15	0.22	.001	29.72	30.58
Age	-0.08	0.02	.001	-0.13	-0.04
Acceptance	1.91	0.15	.001	1.61	2.20
Age X Acceptance	0.04	0.02	.02	0.01	0.07
$R^2 = .10$					
Constant	30.23	0.20	.001	29.83	30.61
Age	-0.09	0.02	.001	-0.13	-0.05
Religious coping	2.47	0.14	.001	2.18	2.75
Age X Religious coping	0.03	0.01	.021	0.01	0.06
$R^2 = .16$					

Note. $df = 3, 1981$

Table 38 illustrates the moderating role of Age of the flood affected individuals in the relationship between coping strategies and posttraumatic growth. Interaction effect of age and positive reframing coping for the prediction of PTG is significant. When the age is low, there are significant positive association between

positive reframing and PTG, $b = 2.10$, 95 % CI [1.71, 2.50], $t = 10.51$, $p = .001$. At the mean value of age, there is significant positive association between positive reframing and PTG, $b = 2.52$, 95 % CI [2.23, 2.81], $t = 16.96$, $p = .001$. When the age is high there is significant positive relationship between positive reframing and PTG, $b = 2.94$, 95 % CI [2.52, 3.35], $t = 14.13$, $p = .001$.

Moreover, interaction effect of age and self-distraction coping for the prediction of PTG is significant. When the age is low, there are significant positive relation between self-distraction coping and PTG, $b = 1.60$, 95 % CI [1.20, 1.99], $t = 7.84$, $p = .001$. At the mean value of Age, there is significant positive relationship between self-distraction coping and PTG, $b = 2.04$, 95 % CI [1.75, 2.34], $t = 13.75$, $p = .001$. When the age is high there is significant positive association between self-distraction coping and PTG, $b = 2.49$, 95 % CI [2.06, 2.92], $t = 11.42$, $p = .001$. Interaction effect of age and active coping for the prediction of PTG is significant. When the age is low, there are significant positive relationships between active coping and PTG, $b = 2.08$, 95 % CI [1.69, 2.47], $t = 10.52$, $p = .001$. At the mean value of Age, there is significant positive relationship between active coping and PTG, $b = 2.53$, 95 % CI [2.26, 2.81], $t = 18.16$, $p = .001$. When the age is high there is significant positive association between active coping and PTG, $b = 2.99$, 95 % CI [2.63, 3.35], $t = 16.22$, $p = .001$.

Besides, the interaction effect of age and planning coping for the prediction of PTG is significant. When the age is low, there are significant positive relationships between planning and PTG, $b = 2.27$, 95 % CI [1.90, 2.64], $t = 11.94$, $p = .001$. At the mean value of Age, there is significant positive relationship between planning coping and PTG, $b = 2.54$, 95 % CI [2.27, 2.81], $t = 18.60$, $p = .001$. When the age is high there is significant positive relationship between planning and PTG, $b = 2.81$, 95 % CI [2.45, 3.17], $t = 15.40$, $p = .001$. Interaction effect of age and acceptance coping for the prediction of PTG is significant. When the age is low, there are significant positive relationships between acceptance and PTG, $b = 1.53$, 95 % CI [1.12, 1.93], $t = 7.43$, $p = .001$. At the mean value of Age, there is significant positive relationship between

acceptance coping and PTG, $b= 1.91$, 95 % CI [1.61, 2.20], $t=12.65$, $p =.001$. When the age is high there is significant positive association between planning and PTG, $b= 2.29$, 95 % CI [1.84, 2.73], $t = 10.11$, $p =.001$. Furthermore, the Interaction effect of age and religious coping for the prediction of PTG is significant. When the age is low, there are significant positive relationships between religious coping and PTG, $b= 2.15$, 95 % CI [1.76, 2.54], $t =10.88$, $p =.001$. At the mean value of Age, there is significant positive relationship between religious coping and PTG, $b= 2.47$, 95 % CI [2.18, 2.75], $t =17.22$, $p =.001$. When the age is high there is significant positive relationship between religious coping and PTG, $b= 2.78$, 95 % CI [2.39, 3.17], $t = 14.02$, $p =.001$. These results support our 19th hypothesis that age would moderate the relationship between coping strategies (such as positive reframing, active coping, planning, religious coping and acceptance coping) and PTG.

Table 39

Interaction effect of the Education with Stress, Anxiety, Depression, PTS and Intrusive Rumination for Predicting Posttraumatic Growth (N =1977)

<i>Interaction Effects</i>	<i>b</i>	<i>SEB</i>	<i>p</i>	<i>LL</i>	<i>UL</i>
Constant	30.22	0.22	.001	29.79	30.64
Education	-0.15	0.12	.226	-0.39	0.09
Stress	.28	0.06	.001	0.17	0.40
Education X Stress	0.06	0.03	.048	0.01	0.13
$R^2 = .02$					
Constant	30.23	0.22	.001	29.81	30.67
Education	-0.22	0.12	.079	0.44	0.04
Anxiety	0.13	0.05	.008	0.03	0.23
Education X Anxiety	0.06	0.03	.025	0.01	0.12
$R^2 = .009$					
Constant	30.24	0.22	.001	29.72	30.54
Year of education	- 0.09	0.02	.001	-0.46	-0.02
Depression	0.08	0.05	.118	0.02	0.17
education X Depression	0.07	0.03	.012	0.02	0.13
$R^2 = .007$					
Constant	30.40	0.21	.001	29.98	30.82
Education	0.19	0.12	.124	-0.05	0.43
PTS	0.18	0.01	.001	0.15	0.21
Education X PTS	0.03	0.01	.001	0.01	0.04
$R^2 = .10$					
Constant	30.31	0.21	.001	29.89	30.73
Education	0.05	0.12	.677	-0.19	0.29
Intrusive Rumination	0.34	0.03	.001	0.28	0.41
Education X Rumination	0.06	0.02	.01	0.02	0.10
$R^2 = .08$					

Note. $df = 3, 1973$

Table 39 illustrates the moderating role of education in the relationship between stress and posttraumatic growth, interaction effect of year of education and stress for the prediction of PTG is significant. When the education is low, there are significant positive association between stress and PTG, $b = 0.17$, 95 % CI [0.01, 0.33], $t = 1.98$, $p = .047$. At the mean value of education, there is significant positive relationship between stress and PTG, $b = 0.28$, 95 % CI [0.17, 0.40], $t = 5.04$, $p = .001$. When the age is high there is significant positive relationship between stress and PTG, $b = 0.40$, 95 % CI [0.24, 0.56], $t = 4.99$, $p = .001$.

Likely, the interaction effect of year of education and anxiety for the prediction of PTG is significant. When the education is low, there is non-significant

positive relationships between anxiety and PTG, $b= 0.01$, 95 % CI [-0.13, 0.16], $t =0.14$, $p =.884$. At the mean value of education, there is significant positive association between anxiety and PTG, $b= 0.13$, 95 % CI [0.03, 0.23], $t =2.67$, $p =.01$. When the education is high there is significant positive association between anxiety and PTG, $b= 0.25$, 95 % CI [0. 11, 0.38], $t = 3.62$, $p =.001$. Interaction effect of year of education and depression for the prediction of PTG is significant. When the education is low, there is non-significant negative relationships between depression and PTG, $b= -0.05$, 95 % CI [-0.19, 0.08], $t =0.75$, $p =.450$. At the mean value of education, there is non-significant positive association between depression and PTG, $b= 0.08$, 95 % CI [0.02, 0.17], $t =1.52$, $p =.118$. When the education is high there is significant positive relationship between depression and PTG, $b= 0.21$, 95 % CI [0. 06, 0.36], $t = 2.84$, $p =.005$. Interaction effect of year of education and PTS for the prediction of PTG is significant.

When the education is low, there is significant positive relationships between PTS and PTG, $b= 0.13$, 95 % CI [0.09, 0.17], $t = 6.63$, $p =.001$. At the mean value of education, there is significant positive relationship between PTS and PTG, $b= 0.18$, 95 % CI [0.15, 0.21], $t =13.01$, $p =.001$. When the education is high there is significant positive relationship between PTS and PTG, $b= 0.23$, 95 % CI [0. 19, 0.27], $t = 10.94$, $p =.001$. Interaction effect of year of education and intrusive rumination for the prediction of PTG is significant. When the education is low, there is significant positive relationship between intrusive rumination and PTG, $b= 0.23$, 95 % CI [0.13, 0.32], $t =4.73$, $p =.001$. At the mean value of education, there is significant positive relationship between intrusive rumination and PTG, $b= 0.34$, 95 % CI [0.28, 0.41], $t =10.39$, $p =.001$. When the education is high there is significant positive relationship between intrusive rumination and PTG, $b= 0.46$, 95 % CI [0. 37, 0.55], $t = 9.63$, $p =.001$. Overall the findings showed that education would moderate the relationship between Stress and PTG, Anxiety and PTG, Depression and PTG, PTS and PTG and rumination and PTG. Hence our 20th hypothesis is supported.

Table 40

Interaction effect of the Overall Flood exposure with the Coping Strategies for Predicting Posttraumatic Growth (N=1985)

<i>Interaction Effects</i>	<i>b</i>	<i>SEB</i>	<i>p</i>	<i>LL</i>	<i>UL</i>
Constant	30.18	0.22	.001	29.74	30.62
Flood Exposure	0.21	0.02	.001	0.16	0.25
Humour	0.54	0.14	.001	0.26	0.82
Flood Exposure X Humour	-0.03	0.01	.010	-0.06	0.01
$R^2 = .17$					
Constant	30.27	0.21	.001	29.85	30.69
Flood Exposure	0.14	0.02	.001	0.10	0.18
Self-Distraction	1.82	0.15	.001	1.53	2.11
Flood Exposure X Self-distraction	-0.05	0.01	.001	-0.07	-0.02
$R^2 = .13$					
Constant	30.21	0.20	.001	29.80	30.60
Flood Exposure	0.14	0.02	.001	0.10	0.19
Active Coping	2.40	0.13	.001	2.13	2.67
Flood Exposure X Active coping	-0.05	0.01	.001	-0.07	-0.02
$R^2 = .21$					
Constant	30.20	0.20	.001	29.80	30.60
Flood exposure	0.14	0.02	.001	0.09	0.18
Planning	2.39	0.13	.001	2.13	2.65
Flood exposure X Planning	-0.03	0.01	.014	-0.06	-0.01
$R^2 = .21$					
Constant	30.20	0.22	.001	29.77	30.63
Flood exposure	0.17	0.02	.001	0.12	0.21
Acceptance	1.72	0.14	.001	1.43	2.00
Flood exposure X Acceptance	-0.05	0.01	.001	-0.07	-0.02
$R^2 = .13$					
Constant	30.26	0.20	.001	29.87	30.65
Flood exposure	0.17	0.02	.001	0.13	0.21
Religious coping	2.33	0.13	.001	2.06	2.60
Flood exposure X Religious coping	0.03	0.01	.021	0.01	0.06
$R^2 = .18$					
Constant	30.17	.21	.001	29.76	30.58
Flood exposure	0.17	0.02	.001	0.12	0.21
Use instrumental support	2.25	0.15	.001	1.95	2.54
Flood exposure X use instrumental	-.03	.01	.024	-0.06	-0.01
$R^2 = .17$					
Constant	30.22	.22	.001	29.78	30.66
Flood Exposure	.17	.02	.001	0.12	0.22
Venting	1.23	0.15	.001	0.93	1.53
Flood Exposure X Venting	-0.03	0.01	.026	-.06	-.01
$R^2 = .08$					

Note. $df = 3, 1981$

Table 40 illustrates the moderating role of flood exposure in the relationship between coping strategies and posttraumatic growth. Interaction effect of total flood

exposure (both subjective and objective) and Humour coping for the prediction of PTG is significant. When the exposure to flood is low, there is significant positive relationship between Humour coping and PTG, $b= 0.88$, 95 % CI [0.46, 1.31], $t=4.10$, $p =.001$. At the mean value of exposure, there is significant positive relationship between humour coping and PTG, $b= 0.54$, 95 % CI [0.27, 0.82], $t =8.86$, $p =.001$. When the exposure is high there is non-significant positive relationship between humour coping and PTG, $b= 0.20$, 95 % CI [0. 14, 0.53], $t = 1.50$, $p =.25$. Interaction effect of flood exposure and self-distraction coping for the prediction of PTG is significant. When the exposure to flood is low, there is significant positive relationship between self-distraction coping and PTG, $b= 2.29$, 95 % CI [1.86, 2.74], $t =10.25$, $p =.001$. At the mean value of exposure, there is significant positive relationship between self-distraction coping and PTG, $b= 1.82$, 95 % CI [1.53, 2.11], $t =12.37$, $p =.001$. When the exposure is high there is significant positive relationship between self-distraction coping and PTG, $b= 1.34$, 95 % CI [0. 95, 1.73], $t = 6.74$, $p =.001$.

Whereas, the interaction effect of flood exposure and active coping for the prediction of PTG is significant. When the exposure to flood is low, there is significant positive relationship between active coping and PTG, $b= 2.90$, 95 % CI [2.50, 3.30], $t =14.35$, $p =.001$. At the mean value of exposure, there is significant positive relationship between active coping and PTG, $b= 2.40$, 95 % CI [2.13, 2.67], $t =17.74$, $p =.001$. When the exposure is high there is significant positive relationship between active coping and PTG, $b= 1.90$, 95 % CI [1. 53, 2.26], $t = 10.20$, $p =.001$. Interaction effect of flood exposure and planning coping for the prediction of PTG is significant. When the exposure to flood is low, there is significant positive relationship between planning coping and PTG, $b= 2.74$, 95 % CI [2.35, 3.33], $t =13.67$, $p =.001$. At the mean value of exposure, there is significant positive relationship between planning coping and PTG, $b= 2.39$, 95 % CI [2.12, 2.65], $t =18.18$, $p =.001$. When the exposure is high there is significant positive relationship between planning coping and PTG, $b= 2.05$, 95 % CI [1. 69, 2.41], $t = 11.22$, $p =.001$.

Moreover, the Interaction effect of flood exposure and acceptance coping for the prediction of PTG is significant. When the exposure to flood is low, there is significant positive relationship between acceptance coping and PTG, $b= 2.12$, 95 %

CI [1.69, 2.55], $t=9.66$, $p=.001$. At the mean value of exposure, there is significant positive relationship between acceptance coping and PTG, $b= 1.72$, 95 % CI [1.44, 2.00], $t =11.88$, $p =.001$. When the exposure is high there is significant positive relationship between acceptance coping and PTG, $b= 1.33$, 95 % CI [0.95, 1.70], $t = 6.57$, $p =.001$. Interaction effect of flood exposure and religious coping for the prediction of PTG is significant. When the exposure to flood is low, there is significant positive relationship between religious coping and PTG, $b= 2.81$, 95 % CI [2.41, 3.23], $t =3.60$, $p =.001$. At the mean value of exposure, there is significant positive relationship between religious coping and PTG, $b= 2.33$, 95 % CI [2.06, 2.60], $t =17.37$, $p =.001$. When the exposure is high there is significant positive relationship between religious coping and PTG, $b= 1.87$, 95 % CI [1.48, 2.21], $t = 10.01$, $p =.001$.

Likewise, the interaction effect of flood exposure and Use emotional support coping for the prediction of PTG is significant. When the exposure to flood is low, there is significant positive relationship between Use emotional support coping and PTG, $b= 1.98$, 95 % CI [1.54, 2.42], $t =8.75$, $p =.001$. At the mean value of exposure, there is significant positive relationship between Use emotional support coping and PTG, $b= 1.59$, 95 % CI [1.30, 1.89], $t =10.67$, $p =.001$. When the exposure is high there is significant positive relationship between emotional support coping and PTG, $b= 1.21$, 95 % CI [0.86, 1.57], $t = 6.64$, $p =.001$. Interaction effect of flood exposure and Venting coping for the prediction of PTG is significant. When the exposure to flood is low, there is significant positive relationship between Venting and PTG, $b= 1.56$, 95 % CI [1.10, 2.02], $t =6.86$, $p<.001$. At the mean value of exposure, there is significant positive relationship between Venting and PTG, $b= 1.23$, 95 % CI [0.93, 1.53], $t =8.00$, $p =.001$. While, when the exposure is high there is significant positive relationship between Venting coping and PTG, $b= 0.90$, 95 % CI [0.53, 1.28], $t = 4.70$, $p<.001$.

Table 41

Interaction Effect of the Perceived Social Support with PTS for Predicting Posttraumatic Growth (N=1906)

<i>Interaction Effects</i>	<i>b</i>	<i>SE</i>	<i>p</i>	<i>LL</i>	<i>UL</i>
Constant	11.36	1.37	.001	8.58	13.94
Perceived Social Support	.22	0.02	.001	0.18	0.27
PTS	0.07	0.04	.05	0.01	0.01
Perceived Social Support X PTS	0.01	0.01	.01	0.01	0.01
$R^2 = .29$					
Constant	11.56	1.42	.001	8.78	14.35
Family Support	0.61	0.06	.001	.48	.74
PTS	0.15	0.04	.001	0.07	0.22
Family Support X PTS	0.0	0.01	.96	0.00	0.00
$R^2 = .24$					
Constant	13.46	1.31	.001	10.89	16.04
Friend Support	0.56	0.07	.001	0.43	0.69
PTS	0.13	0.03	.001	0.07	0.20
Friend Support X PTS	.00	0.01	.26	0.00	0.01
$R^2 = .24$					
Constant	16.18	1.13	.001	13.98	18.40
Significant others support	.44	0.06	.001	0.33	0.56
PTS	.09	0.03	.001	.03	.15
Significant others support X PTS	.01	0.01	.05	.001	.01
$R^2 = .24$					

Note. $df = 3, 1902$

Table 41 showed the moderating role of perceived social support in the relationship between PTS and PTG. Results showed that perceived social support moderated the relationship between the PTS and PTG. Interaction effect of perceived social support and PTS for the prediction of PTG is significant at all the three level of slope. When perceived social support is low, there is a significant positive relationship between PTS and PTG: $b = 0.14$, 95 % CI [0.11, 0.17], $t = 10.10$. At the mean value of perceived social support, there is significant positive relationship between PTS and PTG: $b = .16$, 95 % CI [0.14, 0.18], $t = 15.06$. In addition, when perceived social support is high there is significant positive relationship between PTS and PTG, $b = 0.19$, 95 % CI [0.16, 0.22], $t = 12.47$. The findings of interactions effects are presented by following the reporting style of Andy Field (Field, 2009).

In addition, among the domains of the PTG, only the support from the significant others moderated the relationship between PTS and PTG. Findings supports our 21st hypothesis that perceived social support will act as a moderator in the relationship between PTS and PTG.

Understanding Trauma and Growth in an Integrative Psychosocial Framework

For model testing, Structural equation modeling (SEM) was conducted by using AMOS 20.0 software (Chicago: SPSS). SEM is a statistical approach to test hypotheses about the relationship among observed and latent variables. Moreover, it's a method for specifying and evaluating models of relationships among variables. Before model testing; we checked the assumptions for model testing, including, appropriate sample size, linearity, non-zero covariance, no multicollinearity and interval data. Our data fulfilled these assumptions. In evaluating the adequacy of all models, we primarily considered the fit indices: Normed fit index (NFI), Incremental fit index (IFI), Tucker-Lewis coefficient (TLI), Comparative fit index (CFI), and the root mean square error of approximation (RMSEA) (Bentler, 1990; Hooper et al., 2008; Steiger & Lind, 1980; Tucker & Lewis, 1973). Based on stringent recommendations, TLI, CFI NFI, and IFI values of 0.95 or greater show excellent fit. However, value of 0.90 or greater is considered to indicate good fit (Hu & Bentler, 1998; West, 2012). In addition, RMSEA estimate is considered to show good fit to the data at values of 0.10 or less (Byrne, 2001). The chi-square (χ^2) statistic is also reported; ideally this statistic is non-significant in the model, but mostly influenced by sample size. It helps model interpretation (Hayduk, 2007; Kline, 2005).

For model testing the predictors of PTG (i.e., Flood exposure, intrusive rumination, psychological distress, PTS, deliberate rumination, social support and

coping strategies (such as, acceptance, positive reframing, active coping, and planning coping) were entered in the path model. Results are displayed in the following model.

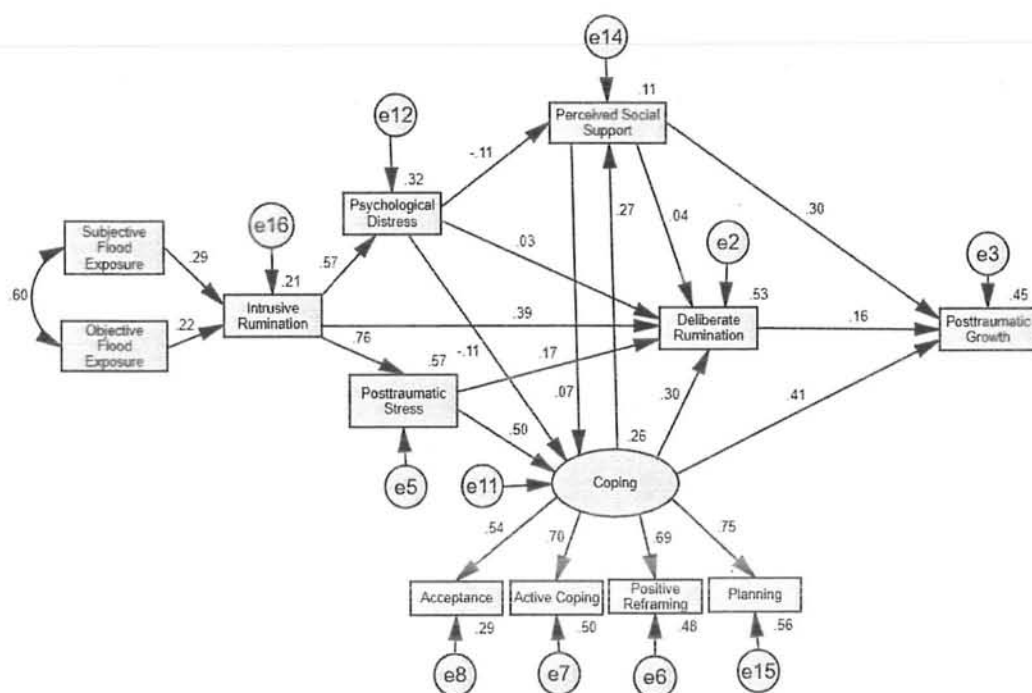


Figure 11. Final, fully mediated, general model: Predictors of PTG among Flood Exposed Individuals

Figure 11 shows the fully mediated, general model that demonstrates the predictors of PTG among flood exposed individuals. Results in the model showed that predictors of intrusive rumination explained the 21 per cent of its variance. In other words, the error variance of intrusive ruminations approximately 79 per cent of the variance of intrusive rumination itself. Moreover, the predictors of PTS explained 57 per cent of its variance. The predictors of psychological distress explain 32 per cent of its variance. Furthermore, Predictors of coping and social support explained 26 and 11 per cent of its variance respectively. The predictors of deliberate rumination explain

the 53 per cent of its variance. In addition, the predictors PTG explain the 45 per cent of variance. Hence the Final, fully mediated, general model explain the 45 per cent of the variance. Hence, it supports our 22nd hypothesis that rumination processes, PTS, coping strategies and perceived social support would mediate the relationship between flood appraisal and PTG.

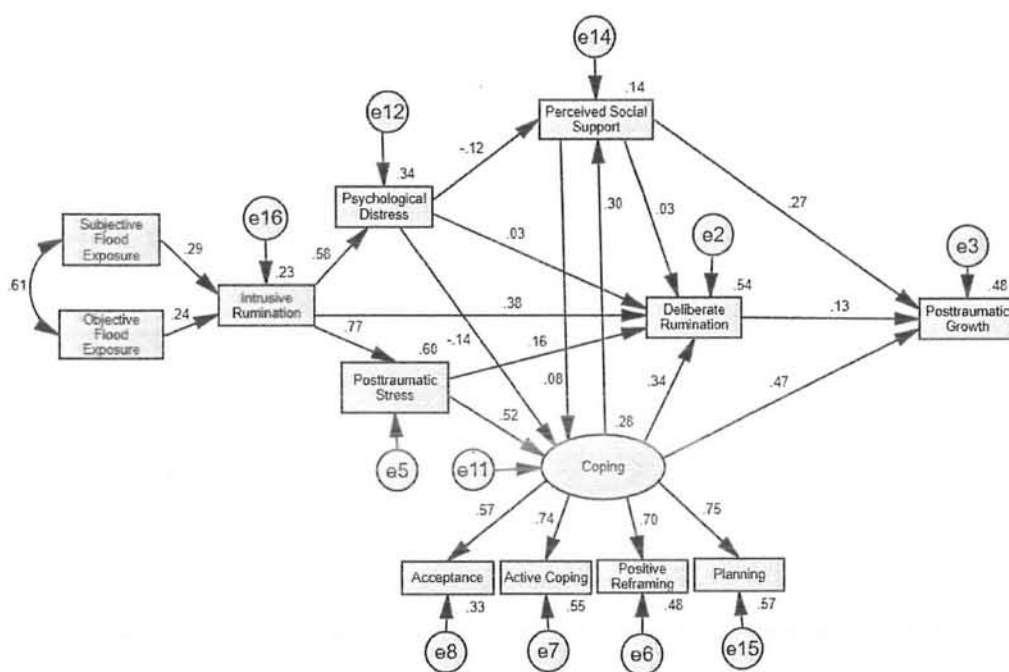


Figure 12. Final, fully mediated, model: Predictors of PTG among Flood Exposed Men

Table 42

Fit Indices for Model Testing (N=2000)

Model Number	χ^2 (df)	IFI	NFI	TLI	CFI	RMSEA	$\Delta \chi^2$ (df)	p
Model1(N=2000)	121(39)	.99	.99	.98	.99	.03	-	.001
Model 2 gender (unconstrained)	167(78)	.99	.98	.98	.99	.02	46(39)	.20

Note. IFI= incremental fit index; NFI= normed fit index; CFI= comparative fit index; TLI=Tucker-Lewis coefficient; RMSEA= root mean square error of approximation

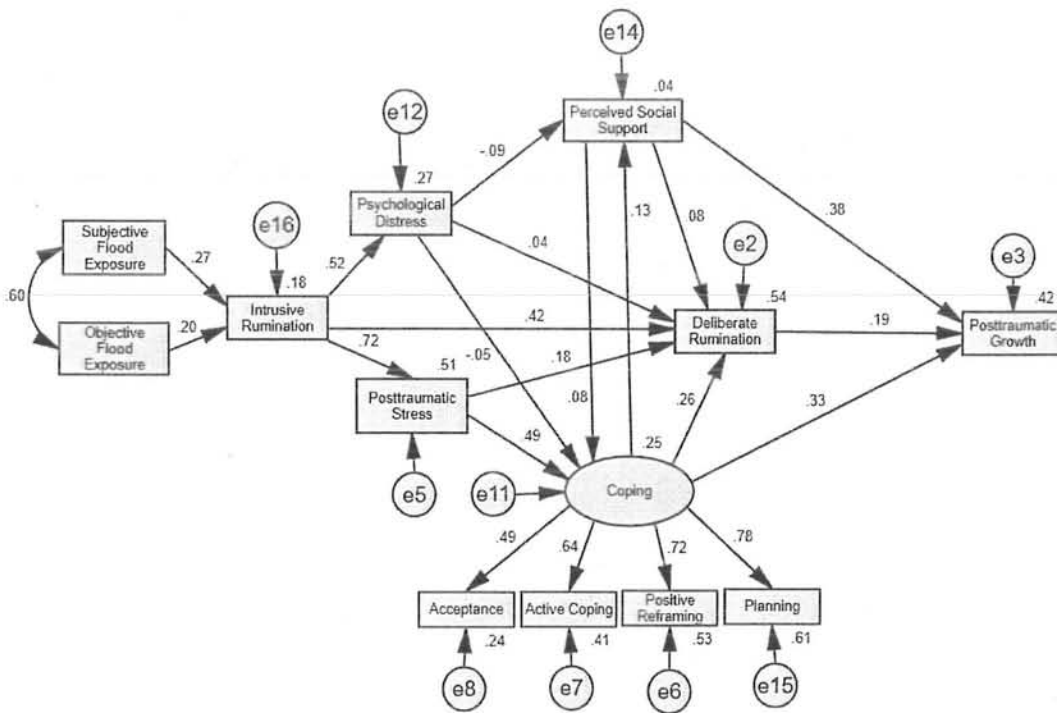


Figure 13. Final, fully mediated, model: Predictors of PTG among Flood Exposed Women.

Results from Table 42 showed that indices of Incremental fit index ($IFI = .99$), Normed fit index ($NFI = .99$), Tucker-Lewis coefficient ($TLI = .98$) and the Comparative fit index ($CFI = .99$) and the RMSEA is .03. The values of these indices are in acceptable ranges (Hooper et al., 2008). For example, IFI , TLI , and CFI values close to 1 indicate a very good fit (Bollen, 1986; Bollen, 1989b). Models with overall fit indices of NFI less than .09 can usually be improved. A value of the RMSEA of about .05 or less show a close fit of the model (Bentler & Bonett, 1980; Browne & Cudeck, 1993). To see whether this model can be generalized both for men and for women, for this purpose, the unconstrained model was computed and the p value is non-significant and it shows that the model can be applicable for both the genders. The non-significant results showed that the model is applicable for both the genders.

Table 43

Estimation of Standardized Regression Weights of Final, Fully Mediated Model (N=2000)

<i>Outcome</i>		<i>Predictors</i>	β
Intrusive Rumination	<---	Flood Exposure Subjective	.29***
*Intrusive Rumination	<---	Flood Exposure Objective	.22***
PTS	<---	Intrusive Rumination	.76***
Psychological Distress	<---	PTS	.28***
Psychological Distress	<---	Intrusive Rumination	.57***
Coping	<---	Psychological Distress	-.11***
Coping	<---	PTS	.50***
Social Support	<---	Coping	.27***
Social Support	<---	Psychological Distress	-.11***
Deliberate Rumination	<---	Coping	.31***
Deliberate Rumination	<---	Social Support	.04
Deliberate Rumination	<---	Intrusive Rumination	.39**
Deliberate Rumination	<---	Psychological Distress	.03
Deliberate Rumination	<---	PTS	.16***
Posttraumatic Growth	<---	Deliberate Rumination	.15***
Positive Reframing	<---	Brief Cope	.70***
Active Coping	<---	Brief Cope	.71***
Acceptance Coping	<---	Brief Cope	.55***
Planning Coping	<---	Brief Cope	.76***
Posttraumatic Growth	<---	Brief Cope	.41***
Posttraumatic Growth	<---	Social Support	.30***

Note. *** $p < .001$

Table 43 shows the estimation of standardized regression weights of the predictors and outcome variables. Detail description is given in the Figure 11. Final, fully mediated, model predictors of PTG among flood exposed individuals.

DISCUSSION

The broad objectives of the T1 of the study were to understand trauma and growth in an integrative psychosocial frame work. More specifically, the study had undertaken to examine the prevalence of PTS, distress responses, and PTG among individuals who have been exposed to 2010 flood in Pakistan. Moreover, it aimed to identify the variables associated with PTS and PTG as well as the predictive role of flood appraisal and flood relate rumination to PTS and PTG was also examined. Furthermore, mediating role of PTS, psychological distress, and flood related rumination between the trauma appraisal and PTG and the moderating role of age, gender, education, income, social support and coping was also examined.

To meet the objectives, a sample of 2000 individuals was taken from the different flood affected areas of Pakistan. Keeping in mind the longitudinal nature of the study, the demographic sheet was designed in such a way that future contact with the study participants would be easy. Informed consent of the respondents was taken. Data analysis was done by using Predictive Analytics Software (PASW) 18. Bivariate correlation, Independent sample *t*-test, Analysis of Variance (ANOVA) and regression analysis was computed to test the hypotheses. For Model testing, Structural Equation Modeling (SEM) was done by using Analysis of Moment Structures (AMOS 16). Alpha reliability of the scales showed that scales are reliable (See Table 8).

Measurement Models: Confirmatory Factor Analysis of the Scales

To see the factor structure of the scales, confirmatory factor analysis was done. Factor loadings were examined based on the criteria ($>.3$). Factor Loadings of

the DASS is ranged from .44 to .72. Factor loading of the Impact of Event Scale and Event Related Rumination Inventory is ranged from .38 to .67 and .50 to .85 respectively. Moreover, the factor loading of the Short- form of the Posttraumatic Growth Inventory-SF and Satisfaction with Life Scale is ranged from .47 to .79 and .29 to .88. As the factor loading of the item 5 of the life Satisfaction scale was .29. So, it is accepted without any further modification. The CFA of Multidimensional Scale of the Social Support Scale showed satisfactory loadings that are ranged from .70 to .82. However, for the improvement of model fit indices, Covariance between the item 1 and 2 are added. Values of fit indices are after the modifications are satisfactory. Similarly, CFA of Psychological Wellbeing Scale (WBQ-12) showed that items loadings were ranged from .13 to .74. Based on initial criteria of factor loading i.e. item loadings $>.3$, items were examined. Items 5(.13) and 8(.22) showed poor loadings while rest all items were having good factor loadings. Covariance between the item 5 and 8 are added. After the modification, the values of fit indices are satisfactory. Values of fit indices of all the above mentioned scales are reported in Table 16.

Prevalence of Trauma and Distress among Flood Affected Individuals

To see the prevalence of stress, anxiety, depression and PTS among flood affected individuals, findings showed that even after about the three years of the flood, both male and female population had scored high on the moderate to severe ranges of stress, anxiety, depression, and PTS (Table 17). These findings are consistent with the earlier findings that had shown that psychological complication and emotional problems like PTS, stress reactions, depression, and anxiety had markedly increased following a disaster in a community or in general

population(Freedy et al., 1992; Galea et al., 2005; Goenjian et al., 2001; Karakaya et al., 2004; Kessler et al., 1995; Kolaitis, 2003; Magruder et al., 2015; Neria et al., 2008; Sana & Khattak, 2014;Tunstall et al., 2006; Xu & Liao., 2011; Zhang et al., 2012).

To see the gender difference on the study variables, current findings showed that women scored significantly high on stress, depression and PTS as compared to men. These findings are consistent with the past local as well as the global research have demonstrated that the distress responses were higher among female as compared to males (Aslam &Tariq 2007; Aslam & Kamal, 2013b; Buchi, 2007; Hashmi et al., 2011; Hussain & Bhushan, 2011; Marshall, Frazier, Frankfurt, & Kuijter, 2015; Norris et al., 2002; Teixeira & Pereira, 2013; Vishnevsky et al., 2010; Warsini et al., 2014).

Effort have been made to understand that why this gender difference occurs and females scored high as compared to male. An increased incidence of distress in women may be associated to female heightened exposure to interpersonal negative life events as well as greater vulnerability to ruminate about adverse life events (Byllesby et al., 2016; Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994; Pan et al., 2015). Another reason could be the subjective appraisal to the trauma. It is well established that psychological distress and PTS in any population depends, in part, on the nature of appraisal to trauma. Generally, males experience less sense of danger and experience trauma less stressful as compared to women (Vernberg et al., 1996). However, mental health professionals ought to consider a multifaceted approach to buffer the effect of high prevalence of trauma and distress.

Psychosocial Correlates of Posttraumatic stress and Posttraumatic Growth

To see the relationship among the study variables, it was found that psychological distress was positively associated with PTS, both types of rumination; while negatively associated with social support, life satisfaction, psychological wellbeing, and PTG. The negative relationship between the distress and PTG is consistent with past literature (Kimhi et al., 2010). Moreover, results showed that PTS was positively associated with psychological distress, both types of ruminations, and PTG; while negatively associated with life satisfaction, social support and psychological wellbeing (See Table 19 for detail). Our these pattern of findings are consistent with PTG theory and with some PTG studies conducted with adult individuals (Butler et al., 2005; Hafstad et al., 2011; Levine et al., 2008).

The results of the current study also showed that intrusive rumination was positively associated with the psychological distress, PTS, deliberate rumination and negatively associated with the social support, life satisfaction and psychological wellbeing. In addition, flood appraisal was positively associated with the distress, PTS and PTG. Findings are in line with the previous literature (Alisic et al., 2008; Barakat et al., 2006; Butler et al., 2005; Cadell, 2007; Calhoun, Cann, & Tedeschi, 2010; Currier et al., 2009; Gate et al., 2013; Hafstad et al., 2011; Hegelson et al., 2006; Levine et al., 2008; Lopez et al., 2009; Martin & Tesser, 1996; Milam et al., 2004; Phipps et al., 2007; Schaefer & Moos, 1998; Soo & Sherman, 2015; Taku et al., 2009; Vaughn et al., 2009; Weiss, 2004; Wolchik et al., 2009; Wu et al., 2015; Xu & Liao, 2011; Yonemoto et al., 2012; Yu et al., 2010). Moreover, deliberate rumination was more strongly related to PTG while the intrusive rumination strongly associated with

the PTS and distress. These findings are supported by the past literature that suggests that intrusive rumination increases the incidence of stress, anxiety and depressive symptoms (Gate et al., 2013; Soo & Sherman, 2015). Further, intrusive ruminations may prime the process of more deliberate rumination that ultimately facilitates growth.

Social support seems to be an important variable that contributes to growth and buffers the effect of trauma. In the current study, three types of social support have been measured such as support from friends, family and significant others. Studies that have investigated the relationship between PTG and social support depicted the affirmative relationships. Hence, the positive relationship between social support and PTG is inline with the broader literature (Chu, Saucier, & Hafner, 2010; Cotton et al., 2010; Dew et al., 2008; Forstmeier et al., 2009; Larson, Hansen, & Moneta, 2006; Nishi et al., 2010; Tanriverd et al., 2012; Tsevat & Drotar, 2006). For instance, Sakaguchi (2002) found that the perception of social support had a significant correlation with both appreciation for life and appreciation for human relationship (Tanriverd et al., 2012). Although, perceived social support of the participants was measured, however, we were unable to measure the support sought by and available to individuals from the government and NGO's during rescue, recovery and rehabilitation phases after the flood 2010 in Pakistan. Moreover, affected individuals may have sought help from other sources, such as support groups, family members, through special government grants, or religious organizations. Future studies should examine these other help-seeking efforts and their differential impact. Social support through marriage is an also a one of the major source of social support. In the current study, it was found that married individuals scored high on

PTG. The possible reason could be that marriage might have the buffering role against distress or the family might serve as a protective factor for an individual. For instance, Ho et al. (2011) suggested that when compared to unmarried individuals, married individuals showed high deliberate rumination and subsequent growth. Moreover, cohabitation/marriage was associated with increased PTG (Harding et al., 2014). Future studies should see the role of marital support in the longitudinal course of PTS and PTG relationship.

Demographics Correlates of Posttraumatic stress and Posttraumatic Growth

To see the relationship between the demographic variables and the study variables, current findings showed that age was negatively associated with psychological distress, PTS, and PTG; while positively associated with the deliberate rumination and psychological wellbeing. Findings are aligned with the past research (Hafstad et al., 2010; Kilmer et al., 2009; Taku, Kilmer, Cann, Tedeschi, & Calhoun, 2011). It is however, important to take into consideration the age when the negative or adverse event was first time experienced in an individual life, as opposed to one's age when assessments were taken. Because, studies showed that as time between adverse event and assessment increases, levels of PTG and growth experiences may change within this time gap.

To further see the age related differences in study variables, results showed that adolescents scored high as compared to adults and older adults in level of flood exposure, PTS, perceived social support, intrusive rumination, and distress. Moreover, adolescents scored high on the various domains of PTG such as personal strength, new possibilities, and life appreciation (See Table 28 & 29). The possible reason could be that adolescent take the trauma as challenge and try to find out the unique

solutions. For instance, Powell et al. (2003) concluded that more youthful individuals reported considerably more growth than more seasoned individuals. Furthermore, the higher rate of PTS in adolescents can be explained in the light of Erikson's psychosocial theory identity vs. role confusion stage. Moreover, in late adolescence, people are expected to leave their family and take on an adult role in society (Calhoun, Cann, & Tedeschi, 2010; Siqveland, Hafstad, & Tedeschi, 2012). Future studies should assess the mechanism of age related changes in PTS and PTG while keeping in mind the gender difference. As the results of Vishnevsky et al. (2010) meta-analysis showed that on average, gender differences have been more prominent almost around the age of 35. Moreover, women reported more posttraumatic growth as age increased.

To see the relationship of education with the study variables, results showed that education was negatively associated with psychological distress, PTS, intrusive rumination, and positively associated with life satisfaction, PTG, and psychological wellbeing. Similar findings are given by the past research on PTG (Hall et al., 2008; Jeon, Yoo, Kim, & Lee, 2015; Linley & Joseph, 2004). Besides, current findings showed that income was negatively associated with psychological distress, PTS, intrusive rumination and positively associated with the social support, life satisfaction, psychological wellbeing and PTG. These findings are in accordance with the existing literature (Koutrouli et al., 2012; Rajkumar, Mohan, & Tharyan, 2013; Wang et al., 2014).

Current findings demonstrated that the objective and subjective severity of the exposure to trauma was positively associated with PTG (See Table 19). These findings are aligned with the past literature which showed that a moderate severity of

trauma evokes distress, that evoke cognitive processing and subsequent growth (Armstrong & Shakespeare-Finch, 2011; Barakat, Alderfer, & Kazak, 2006; Lopez, Camilli, & Noriega, 2014; Morris, Shakespeare-Finch, Rieck, & Newbery, 2005). However, past research that have defined stress objectively such as environmental events that objectively threaten the physical or emotional/psychological wellbeing of individuals were less likely to exhibit the relationship between trauma severity and growth as compared to those studies that have used a more subjective definition of stress such as particular relationship between an individual and the external environment that is appraised by the person as traumatic were more likely find the relationship between trauma severity and growth (Grant et al., 2003; Lazarus & Folkman, 1984).

Kilmer et al. (2009) reported that subjective stress significantly predicted PTG. These findings are consistent with PTG theory, which emphasizes that trauma appraisal catalyze the process of PTG (Calhoun & Tedeschi, 2006; Stanton, Bower, & Low, 2006; Tedeschi, Calhoun, & Cann, 2007).

To see the relationship between the coping strategies and PTG, it was demonstrated that the PTG was positively related with the active coping, positive reframing, acceptance coping, use of instrumental support, planning, self-distraction, denial, behavioral disengagement, self-blame, venting, and religious coping. These findings are partially in line with past studies (Ai, Hall, Pargament, & Tice, 2013; Kinsinger et al., 2006; Koutrouli, Anagnostopoulos, & Potamianos, 2012; Jeon, Yoo, Kim, & Lee, 2014; Joseph & Regel, 2010; Turner-Sack et al., 2012; Ullman, 2014). Moreover, PTG was negatively associated with the substance abuse coping. It can be inferred that the utilization of appropriate coping may be important for promoting higher PTG. It is however, important to further see the role of coping in the

relationship between the social support and PTG. The current findings are in congruence with the past empirical research. Previous literature is full of evidences that the cognitive strategies of religion, acceptance coping and positive reframing are negatively related to distress, while using religion positively related to PTG. However, behavioural disengagement, self-blame, denial, and venting were positively related to distress (Bussell & Naus, 2010).

In addition, to see the gender difference in coping, results showed that women scored high self-distraction, active and denial, humour, and self-blame coping while, men scored high in substance abuse coping (Angstad, Norman, & Barton, 2009; Collicutt et al., 2006; Arpawong et al., 2014; Cryder, Kilmer, Tedeschi, & Calhoun, 2006; Yonemoto et al., 2012). One might assume that being spiritual/religious may help the individuals cope with trauma via forgiveness, acceptance, and meaning-making. Moreover, the areas from where we gathered the data are the vulnerable areas for flood. These areas are under the threats of flood almost every year, so the respondents might have the mind set to cope with adversity (Norris et al., 2002). Hence, the further research should examine the mediating role of coping between the past traumatic reactions and PTG using a longitudinal design.

Psychosocial and Demographic Predictors of Posttraumatic Growth

To see the predictive role of the main study variables to PTG, hierarchical multiple regression revealed that after controlling the effect of demographic variables and potential confounding variables, intrusive rumination, deliberate rumination, PTS and distress accounted for 43% of the variance in PTG (Table 32). Findings are in line with the past literature (Teodorescu et al., 2012). These predictive variables are selected on the basis of previous literature. Past studies have identified the similar psychosocial and environmental predictors of PTG (Arpawong et al., 2012; Cordova,

Cunningham, Carlson & Andrykowski, 2001; Pietrzak et al., 2010; Hagedaars & van Minnen, 2010; Dekel & Nuttman-Shwartz, 2009). We also conducted hierarchical multiple regression to see the self-reported PTG as the dependent variable. Findings showed that demographic variables contributed significantly to the PTG. Moreover, additional 30 % of the variation in PTG was explained by the rest of the predictors. Findings are inline with the (Devine et al., 2010; Hussain & Bhushan, 2011; Lee & Kim, 2012; Love & Sabiston, 2011; Xu & Liao, 2011).

Examining the Moderating Role of Demographics

To see the moderating role of the demographic and environmental variables, interaction effects of the age, education and level of subjective and objective flood exposure were made with stress, anxiety, depression, PTS, intrusive rumination, deliberate rumination and coping strategies for the prediction of PTG. PROCESS macro model 1 (simple moderation) (Hayes, 2013) was used to see the interaction effects of the above mentioned variables. Results showed the moderating role of level of flood exposure, age, and education moderate the relationship between psychological distress, PTS, coping mechanisms, rumination and PTG. To see the moderating role of level of objective exposure to flood with stress, PTS, intrusive and deliberate rumination, results showed the significant interaction effects. The current models that was consistent with the hypotheses that age, flood appraisal, education, and social support moderates the relationship between stress, anxiety, depression, PTS, intrusive rumination, deliberate rumination and PTG (See Table 36 to 41 for the detail account).

The moderating role of these variables have established by many past studies. For example, Laufer and Solomon (2006) found that Israeli adolescent revealed a significant interaction between subjective and objective exposure. Findings indicate

that events involving threat to self are closely related to PTG. Overall, the results of the current study provide evidence that trauma exposure type such as subjective and objective appraisal plays an important role in the level of PTG. Moreover, our moderation analysis findings are in line with the previous literature that showed that strength and linearity of PTS and PTG relationships differed according to trauma type and age (Bellizzi et al., 2010; Bluvstein et al., 2012; Dohrenwend, 2006; Grant et al., 2003; McCaslin et al., 2009; Shakespeare-Finch & Lurie-Beck, 2014; Prati & Pietrantonio, 2009; Vishnevsky, Cann, Calhoun, Tedeschi, & Demakis, 2010). However, the disparity observed in some of the findings could be because of methodological issues including differences in the magnitude of the disasters, and the time elapsed between the onset of the disaster and data collection. Future research would benefit from examining the association between subjective and objective trauma in more detail.

Understanding Trauma and Growth in an Integrative Framework

For understanding the trauma and growth in an integrative framework, the original PTG model that is proposed by Tedeschi and Calhoun (2004) was tested. It states that it is the psychological struggle after trauma that pushes forward toward growth. From a conceptual perspective, intrusive rumination sets the stage for later deliberate rumination that has philosophical and existential consequences. The current model explained the 46 per cent of variance in PTG. To see the moderating role of gender, unconstrained model was computed and the *p* value is non-significant and it shows that the model can be applicable for both the genders. The non-significant results showed that both the men and women had the same processes for PTG (See Figures. 11, 12, 13). Indices of fit are in satisfactory and are in acceptable ranges (Bentler & Bonett, 1980; Bollen, 1986a; Bollen, 1989b; Browne & Cudeck, 1993).

Findings confirm the Tedeschi and Calhoun (2004) theory and our proposed model that is proposed in the rationale of the study (See Figure 1). The mediational role that cognitive processing such as deliberate rumination and social support played in the relationship between PTS and PTG is consistent with past research (Armstrong & Shakespeare-Finch, 2011; Helgeson et al., 2006; Linley & Joseph, 2004; Maercker & Herrle, 2003). These findings confirm the study assumptions that certain level of stress and distress is necessary to evoke growth and that there is coexistence of PTS and growth and both variables operate in the same manner.

The findings from this study contribute to our understanding of the individual's response in a number of important ways. Based on these findings interventions can be devised while considering the role of rumination patterns, coping styles, and social support. It may help in reducing the psychological and physical costs associated with a natural disaster. In addition, there is a need, particularly in an undeveloped country like Pakistan for a broader understanding of the adaptive processes that may facilitate reconstruction and rehabilitation of the individuals affected in natural disaster. Accordingly, individuals with high levels of PTG should not be ignored, but rather, they should continue to get help to alleviate their posttraumatic stress symptoms (Liu, Wang, Li, Gong, & Liu, 2017). The present study may be helpful in raising awareness about the relationship and interplay between trauma and growth and may prove to be a base line study for future researchers. The study may also be helpful for researchers working on trauma and growth caused by exposure to violence, and extreme forms of sexual and physical abuse and other man-made and natural disasters. The findings would be helpful in developing psychosocial support programs for people who had experienced some sort of adversity.

Limitations and Recommendations

The study has a number of methodological and theoretical considerations for future research. The present study, which was carried out almost about three years of the disaster, cannot claim that psychological distress and PTS in the individuals who were living in the flood affected areas are because of this flood, because no pre-disaster normative data were available. In the absence of any base line epidemiological studies on the prevalence of stress reactions in a given population it is difficult to draw any decisive inferences. We were not able to gauge that how much distress or growth was changed due to this flood and was impossible to assess quantitatively the psychological changes after the exposure. However, this suggests the essentialness of evaluating pre-event characteristics while considering the development of trauma and growth.

The data of affected population in most remote areas and uneducated individuals was not available. We included only those individuals, who were educated and willing to participate in our study. Sample was taken by using purposive sampling that can read and write and with minimum education of matriculation. So the future research should incorporate the sample of illiterate people and data can be taken by using qualitative methods such as focus group discussions (FGDs). Hence, the generalization of the findings should be done with caution to the national sample. Besides, data on important demographic variables such as details about the past trauma history, previous psychiatric illness history, and family psychiatric illness etc. was not collected, so it might confound the results. There is also need to obtain information from flood survivors on the extent of damage to their homes, participation in rescue operations, and witnessing grotesque sites etc. Such an information becomes important in detecting fine differences in the ways individuals

react to trauma experiences, and the way they cope with them (Basoglu, Kilic, Salcioglu, & Livanou, 2004). Self-report measures were used for data collection, it is generally assumed that people while giving data on self-report measures would exaggerate the distress or PTS symptoms and same is the case with the reporting the PTG. The estimated rates of PTS, distress or PTG reported may be overrated. Indeed, self-report assessments are known to overestimate PTS and psychological distress (Carlier, Lamberts, Van Uchelen, & Gersons, 1998). In addition, convenient sampling was used as the participants of the study were volunteers who agreed to be the part of the research. Therefore, random sampling may give the more generalize able findings.

Moreover, the study involve retrospective ratings, respondents may display recall bias. Due to resource restrains, third-party reports were not available for external validation (i.e., lacking of credibility checks). Ideally, data from multiple informants ought to be collected. Owing to the cross-sectional and correlational design of the first time point, the findings do not permit to draw conclusive inferences regarding the causality of study variables. In the model testing causal paths showed the significant results, however, to draw the causality from the longitudinal data instead of cross sectional data may give more plausible explanations. Hence, with the longitudinal design we may better qualify the causal link between the variables. Future studiesought to lookthe growth mechanisms by seeing the role of rumination styles, social support, and emotional distress among diverse disaster ridden population. The nature and mechanism of integration of the trauma and growth can be further established in longitudinal framework. Notwithstanding these limitations, large sample size is strength of the study.

Conclusion

Trauma and growth may coexist and an adequate level of distress is required to engender growth. Understanding the trauma and growth in an integrative framework would help in devising appropriate interventions plans. Effective or ineffective functioning lies along a continuum of human functioning and are extreme variants of normal psychological processes. However, cognitive processing seems to play a significant role in the emergence of PTG. Mental health providers may consider the survivors' cognitions (rumination patterns), social support networks, and personal characteristics while making the plans to alleviate their distress and posttraumatic stress symptoms and cultivate PTG. It is commonly observed that after exposure to disastrous situation; it is presumed that survivors would definitely develop some sort of psychopathology and need certain interventions. Based on these suppositions interventions are planned. These 'uninvited interventions' are counterproductive if they thwart the growth and hinder the process of reflection, contemplation and deliberation. Humans have the natural tendency to fight back and meaning making, in the face of trauma. However, interventions, if devised, should aim to facilitate the meaning making out of the event. The more this uninterrupted rumination/reflection process would take place the better it is. Hence, it is most probable, that due to contemplation one may extract the essence of life, development of new self-understanding and come out of trauma with more assurance, confidence, and growth.

SECOND TIME POINT OF THE STUDY

Objectives

The objective of the T2 of the study was to identify the patterns in the temporal course of PTSD, distress responses, rumination patterns, coping strategies and PTG over T1 to T2 (with the gap of six months), among individuals exposed to 2010 floods in Pakistan. Moreover, it would explore the changing patterns of social support, coping strategies and life satisfaction over T1 and T2.

Hypotheses

Based on the previous literature, the following hypotheses were formulated

1. Flood related intrusive and deliberate rumination, PTSD, psychological distress and PTG will more likely decline in T2 as in comparison to T1.
2. There will be decline in all domains of PTG (Personal strength, New possibilities, Relating to other, Life appreciation, and Spiritual change) in T2 as in comparison to T1.
3. PTSD T1, Distress T1, intrusive rumination T1, Deliberate rumination T1, social support T1, Psychological wellbeing T1 and Life satisfaction T1 will be positively associated with the PTSD T2, Distress T2, intrusive rumination T2, Deliberate rumination T2, social support T2, Psychological wellbeing T2, and Life satisfaction T2 respectively.

4. Distress T1 and T2 will be negatively associated with the PTG T2 while the PTS T1 and T2 will be positively associated the PTG T2.
5. Coping strategies will more like decline in T2 as in comparison to T1. However, substance use coping would increase in T2 as in comparison to T1
6. Coping strategies T2 will be positively associated with the PTG T2. However, substance abuse, and self-blame coping will be negatively associated with the PTG T2.
7. PTG T1 will be the predictor of the PTG T2 and the PTS T1 will be the predictor of PTS T2

Sample

For T2, we selected the Mianwali district of Punjab, as there was almost equal participation of both the gender during the T1. As noted earlier 327 individuals participated at T1, 239 participated at T2 (88[26.91] could not be located). Total sample was 239 individuals taken from Mianwali, Punjab. The age ranged from 16 to 65 years ($M = 27.50$, $SD = 9.85$). Minimum education level was 10 years to 16 years ($M = 13.17$, $SD = 1.51$). Mean self-income was 13.42 thousands Pakistani rupees and almost 75.3 % of participants had some loss of property during flood.

Table 44

Demographic Characteristics of the sample of Second Time Point of the Study (N=239)

Demographics	<i>f</i>	<i>% age</i>
Gender		
Male	115	48.1
Female	124	58.9
Education		
Matriculation	10	3.8
Intermediate	115	48.1
Graduation	80	33.6
Masters	34	14.3
Marital Status		
Unmarried	141	59.4
Married	96	40.2
Widowed	02	.8
Employment Status		
Employed	84	35.1
Unemployed	148	61.9
Missing	07	3.0

Measures

For data collection, Depression Anxiety and Stress Scale (Lovibond & Lovibond, 1995); Impact of Event Scale (Horowitz et al., 1979); Event Related Rumination Inventory (ERRI; Cann et al., 2011); Short form of Posttraumatic Growth (PTG-SF; Cann et al., 2010); Well-Being Questionnaire (W-BQ12; Bradley, 2001), Multi Dimensional Scale of Perceived Social Support (Zimet et al., 1988), Brief COPE (Carver, 1997), and Satisfaction with life Scale (Diener et al., 1985) were used in T2. However, from the Demographic questionnaire information related to contact numbers, socioeconomic status, employment status, number of family members, nature of damages and losses during the flood and experience any traumatic event soon after the flood, that may have caused them significant distress were excluded.

Moreover, Flood- Related Exposure Scale was also excluded for the second time point.

Procedure

Procedure for the data collection for T2 was the same as used for the taking information at T1. The already trained enumerators were again contacted. However, for the T2 of data collection, we again obtained informed consent. The nature and purpose of the research was again explained to the participants. They were assured that the data they will provide would only use for the research purpose. Respondents were given the assurance that they can quit at any stage of the study. It took 30 to 45 minutes with an average length of 40 minutes to complete one questionnaire. After data collection, participants were thanked for their cooperation.

RESULTS

Descriptive statistics and bivariate Correlation was computed to examine associations between key variables in both times. Paired sample *t*-test was computed to see the difference in T1 and T2. *ANOVA* was computed to see difference across groups. The analysis was done by using Predictive Analytics Software (PASW) 18. For Regression Analysis, assumptions of univariate and multivariate normality were tested. Diagnostic tests of multicollinearity were also conducted, and examination of correlations (See Table 46) revealed that no predicting variables were highly correlated. The assumption of multicollinearity was deemed to have been met. In addition, assumptions of homoscedasticity, linearity, and normality were all satisfied (Field, 2009). For Model testing, Structural equation Modeling (SEM) was done by using Analysis of Moment Structures (AMOS 16) and the latent curve Growth model was used to see changes in the growth pattern across time span.

Table 45

Alpha Reliability Coefficients and other Psychometric Properties of the Scales Used in T2 of the Study (N= 239)

Scales	n	Items	M	SD	α	Range		skew
						Potential	Actual	
Depression, Anxiety, Stress Scale	237	21	17.90	10.87	.92	0-63	0-58	.60
Subscale Stress	237	7	7.13	3.87	.80	0-21	0-19	.41
Subscale Anxiety	236	7	5.01	4.05	.85	0-21	0-19	.77
Subscale Depression	236	7	5.37	4.06	.83	0-21	0-20	.72
Impact of event scale (IES)	232	15	32.40	17.16	.89	0-75	0-75	.19
Subscale Intrusive	238	7	15.28	8.67	.83	0-35	0-35	.19
Subscale Avoidance	238	8	17.12	9.90	.82	0-40	0-40	.19
Intrusive Rumination	235	10	13.44	7.42	.89	0-30	0-30	.09
Deliberate Rumination	233	10	15.15	7.13	.87	0-30	1-28	-.13
Posttraumatic Growth Inventory	237	10	28.02	9.64	.86	0-50	4-48	-.09
Multidimensional Scale of Perceived Social Support	236	12	56.19	16.52	.92	12-84	12-84	-.67
Family support	237	4	19.96	6.19	.87	4-28	4-28	-.80
Friend support	236	4	18.36	6.08	.85	4-28	4-28	-.51
Significant other support	227	4	18.01	7.70	.83	4-28	4-28	-.44
Satisfaction with Life Scale	235	5	21.55	7.37	.84	5-35	5-35	-.06
Brief COPE	233	28	66.95	11.56	.83	0-112	39-98	-.01
Psychological Wellbeing	231	12	15.37	5.19	.82	0-36	2-32	.76
Positive Wellbeing	231	4	6.66	3.23	.79	0-12	0-12	.74
Negative Wellbeing	226	4	3.12	2.86	.71	0-12	0-11	.75
Energy Wellbeing	227	4	6.93	2.36	.69	0-12	1-12	.30

Table 45 shows the descriptive, alpha reliabilities, skewness and other psychometric properties of the scales. The alpha reliabilities of the all the scales are satisfactory, that is ranged from .71 to .92. The values of the skewness illustrates that the data is normally distributed.

Correlation Analysis between the Time 1 and Time 2 Study Variables

To see the relationship between the study variables across time 1 and time 2 correlation analyses was computed. This analysis was performed to test the hypotheses whether there is any relationship between T1 and T2 study variables.

Table 46 illustrates the bivariate correlation between the study variables T1 and study variables T2. Results showed that Distress T1 is positively associated with Distress T2, PTS T2, Intrusive and deliberate rumination T2 while negatively associated with the PTG T2. PTS T2 is positively associated with the distress T2, intrusive and deliberate rumination T2 and PTG T2. Whereas, PTG T2 was positively associated with the PTS T2, intrusive and deliberate rumination T2 while negatively associated with the distress T1 and T2. Results reported in Table 46 supports our Third and Fourth hypotheses.

Table 47 describes that PTG T2 is significantly positively correlated with self-distraction, Active Coping, Denial Coping, Use of instrumental support coping, Use emotional support, Positive reframing, Acceptance, Planning, and Religion coping Whereas, PTG negatively associated with Substance use. Results are significant at .01 levels. Results support our hypothesis that coping strategies T2 would be positively associated with the PTG T2. However, substance abuse and self-blame coping would be negatively associated with the PTG T2. Results support our 6th hypothesis. Results are presented in the Table 47.

Table 46
Psychosocial Time 1 and Time 2 Correlates of Posttraumatic Growth (N=237)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Distress T1	-															
2 Distress T2	.38**	-														
3 Stress T1	.89**	.29**	-													
4 Stress T2	.33**	.91**	.29**	-												
5 Anxiety T1	.91**	.35**	.69**	.30**	-											
6 Anxiety T2	.32**	.90**	.18**	.72**	.35**	-										
7 Depression T1	.92**	.38**	.71**	.31**	.77**	.34**	-									
8 Depression T2	.36**	.91**	.30**	.75**	.30**	.73**	.38**	-								
9 PTS T1	.41**	.24**	.40**	.25**	.37**	.20**	.35**	.21**	-							
10 PTS T2	.19**	.49**	.17**	.50**	.17**	.43**	.18**	.42**	.47**	-						
11 Intr. Rumination T1 ^a	.43**	.32**	.41**	.34**	.38**	.25**	.38**	.28**	.73**	.37**	-					
12 Intr. Rumination T2 ^b	.23**	.51**	.20**	.50**	.20**	.45**	.24**	.44**	.31**	.77**	.35**	-				
13 Deli Rumination T1 ^c	.26**	.20**	.29**	.21**	.23**	.16*	.18**	.18**	.56**	.32**	.65**	.32**	-			
14 Deli Rumination T2 ^d	.12	.48**	.08	.50**	.17	.41**	.10	.42**	.30**	.68**	.37**	.72**	.40**	-		
15 PTG T1 ^e	-.13*	.05	-.09	.06	-.08	.05	-.11**	.03	.28**	.22**	.32**	.24**	.42**	.31**	-	
16 PTG T2 ^f	-.09	-.02	-.09	.04	-.03	-.04	-.12	-.06	.17**	.27**	.14*	.23**	.15*	.35**	.32**	-
Mean	17.5	17.9	7.35	7.13	4.47	5.01	5.66	5.73	34.8	32.4	14.5	13.4	17.6	15.1	30.6	28.0
SD	11.1	10.9	4.02	3.87	4.04	4.06	4.20	4.03	16.9	17.2	7.46	7.41	6.84	7.15	9.31	9.64

Note. Intrusive Rumination^{a,b}, Deliberate Rumination^{c,d}, Posttraumatic Growth^{e,f}

* $p < .05$, ** $p < .01$

Table 47*Relationship of Coping strategies with Posttraumatic Growth at Time 2 (N=239)*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Self-distraction	-														
2 Active coping	.39**	-													
3 Denial	.39**	.32**	-												
4 Substance use	-.08	-.17**	.13*	-											
5 Use emotional sup	.23**	.18**	.27**	.17**	-										
6 Use instr. support	.39**	.37**	.21**	-.17**	.32**	-									
7 Behavioural diseng.	.14*	.03	.23**	.29**	.20**	.08	-								
8 Venting	.36**	.26**	.41**	.23**	.27**	.22**	.13*	-							
9 Positive reframe	.37**	.45**	.33**	-.10	.28**	.45**	.12	.31**	-						
10 Planning	.34**	.43**	.24**	-.20**	.21**	.44**	.04	.14*	.40**	-					
11 Humour	.15*	-.00	.23**	.30**	.21**	.08	.32**	.15*	.13*	-.00	-				
12 Acceptance	.20**	.30**	.30**	.02	.21**	.19**	.18**	.26**	.37**	.31**	.20**	-			
13 Religion	.23**	.22**	.06	-.37**	.06	.29**	-.03	-.06	.21**	.51**	-.16*	.28**	-		
14 Self-blame	.22**	.15*	.36**	.36**	.27**	.02	.33**	.52**	.25**	.03	.31**	.24**	-.26**	-	
15 PTG T2	.33**	.34**	.15*	-.16*	.20**	.32**	.11	.02	.34**	.34**	.11	.25**	.33**	-.03	-

Note. Use emotional sup= Use emotional support; Use instr. Support = Use instrumental Support; Behavioural dis. = Behavioural disengagement; Positive refra. = Positive reframing

* $p < .05$, ** $p < .01$

Table 48*Bivariate Correlation between Time 1 and Time 2 PTG Subscales*

Variables	1	2	3	4	5	6	7	8	9	10
1 Relating to others T1	-									
2 New possibilities T1	.44**	-								
3 Personal strength T1	.53**	.62**	-							
4 Spiritual Change T1	.52**	.55**	.61**	-						
5 Life appreciation T1	.29**	.48**	.42**	.49**	-					
6 Relating others T2	.12	.18**	.19**	.13*	.14*	-				
7 New possibilities T2	.05	.24**	.17*	.23**	.14*	.58**	-			
8 Personal strength T2	.19**	.19**	.20**	.23**	.08	.52**	.61**	-		
9 Spiritual change T2	.12	.23**	.31**	.27**	.21**	.44**	.53**	.47**	-	
10 Life appreciation T2	.11	.20**	.27**	.24**	.20**	.43**	.52**	.31**	.45**	-
Mean	5.64	5.34	5.84	6.79	4.49	5.85	5.63	6.38	7.49	5.33
SD	2.47	2.52	2.65	3.64	2.31	2.28	2.57	2.48	2.26	2.50

* $p < .05$, ** $p < .01$

Table 48 illustrates the correlation of PTG T1 and T2 subscales. Relating to others T1 is significantly positively correlated with personal strength T2, new possibilities T1 is positively associated with the T2 variables such as relating to others, spiritual change, new possibilities, and life appreciation and results are significant at $p < .01$ level. Personal strength T1 is positively associated with other domains of PTG T2. Moreover, spiritual change T1 is positively associated with new possibilities, relating to others, spiritual change T2 and life appreciation. In addition, life appreciation T1 is positively associated with new possibilities, relating to others, spiritual change, and life appreciation.

Table 49

Descriptive Statistics and Comparison of Psychological Distress, PTS, Rumination Patterns, PTG, and Life Satisfaction over Time (N=237)

Variables	N	Time 1		Time 2		r	95% CI		t	p
		M	SD	M	SD		LL	UL		
General										
Psychological Distress	236	17.56	11.13	17.78	10.72	.38**	-1.79	1.34	.28	.78
PTS	235	34.80	16.90	32.26	17.16	.47**	0.28	4.80	2.21	.03*
Intrusive Symptoms	234	17.01	8.81	15.25	8.70	.35**	.47	3.05	2.69	.01**
Avoidance Symptom	236	17.82	9.57	17.04	9.88	.46**	-.51	2.09	1.19	.23
Intrusive Rumination	232	14.56	7.46	13.37	7.40	.35**	.10	2.29	2.15	.03*
Deliberate Rumination	105	17.89	7.14	15.15	7.13	.41**	1.23	4.24	3.60	.01**
Posttraumatic Growth	234	30.83	9.08	28.13	9.59	.32**	1.30	4.10	3.80	.01**
Men										
Psychological Distress	113	17.64	12.26	18.65	11.59	.45**	-3.34	1.32	.86	.39
PTS	112	33.57	17.16	33.39	18.27	.51**	-3.10	3.48	.11	.91
Intrusive symptoms	112	16.59	8.50	15.43	9.23	.35**	-.73	3.06	1.22	.23
Avoidance symptoms	113	17.00	9.90	17.96	10.46	.53**	-2.80	.88	-1.0	.30
Intrusive rumination	111	14.55	7.88	13.64	7.77	.38**	-.73	2.55	1.10	.27
Deliberate rumination	108	17.83	6.94	15.17	6.76	.36**	.77	4.56	2.81	.01**
Posttraumatic Growth	110	31.02	9.81	28.48	9.88	.40**	.50	4.58	2.47	.02*
Women										
Psychological Distress	123	17.49	10.03	16.98	9.83	.28**	-1.63	2.63	.47	.64
PTS	123	35.92	16.65	31.24	16.10	.44**	1.58	7.79	2.99	.01**
Intrusive Symptoms	122	17.39	9.11	15.08	8.21	.35**	.53	4.08	2.57	.01**
Avoidance Symptom	123	18.58	9.23	16.19	9.29	.40**	.57	4.21	2.61	.01**
Intrusive rumination	121	14.57	7.09	13.11	7.06	.32**	-.03	2.95	1.94	.05*
Deliberate rumination	110	17.98	7.56	15.13	7.84	.47**	.25	5.46	2.22	.03*
Posttraumatic Growth	124	30.66	8.42	27.81	9.35	.24**	.90	4.79	2.89	.01**

Note. CI=Class Interval.

* $p < .01$, ** $p < .001$

In Table 49 paired samples *t*-test showed a statistically significant decrease in PTS scores from T1 to T2. PTS were lower to 2.54 with a 95% confidence interval ranging from 0.28 to 4.80. The eta-squared statistic (.50) indicated a large effect size. As displayed in the Table, there are statistically significant decline in intrusive symptoms of PTS, intrusive rumination, deliberate ruminations, and PTG. There was non significant decline for distress, avoidance symptoms PTS. To see the gender difference in study

variables across time, for men the significant decline was in the areas of deliberate rumination and PTG. Deliberate rumination and PTG decreased in T2 (i.e., 2.66 and 2.54) points respectively. In women the decline was on both the intrusive and avoidance symptoms of PTS, intrusive rumination, deliberate rumination and PTG. These findings partially support our hypothesis that both intrusive and deliberate ruminations, distress, PTS, rumination and PTC would decline in T2 as in comparison to T1 passage of time. However, quite contrary to our hypothesis psychological distress remained same at both times points. This may be due to some confounding variables that might be personality, social, or environmental factors. However, our first hypothesis is partially supported.

Table 50

Comparison of Posttraumatic Growth form Time 1 to Time 2 across Gender

PTC Subscales	N	Time 1		Time 2		r	95% CI		t	p
		M	SD	M	SD		LL	UL		
Relating to other	234	5.89	2.25	5.67	2.45	.12*	-.18	.62	1.07	.29
New possibilities	234	5.67	2.54	5.37	2.49	.24**	-.10	.70	1.47	.14
Personal strength	234	6.42	2.45	5.86	2.62	.20**	.14	.97	2.65	.01*
Spiritual change	234	7.53	2.21	6.79	2.64	.27**	.37	1.13	3.89	.01**
Life appreciation	234	5.37	2.48	4.51	2.32	.20**	.47	1.25	4.33	.01**
Men										
Relating to other	110	6.05	2.22	5.97	2.39	.24**	-.46	.62	.30	.76
New possibilities	110	5.88	2.53	5.30	2.60	.32**	.02	1.15	2.04	.04*
Personal strength	110	6.65	2.46	5.95	2.69	.19*	.07	1.31	2.21	.03*
Spiritual change	110	7.16	2.53	6.66	2.52	.24**	-.09	1.09	1.68	.10
Life appreciation	110	5.35	2.50	4.62	2.52	.34**	.18	1.27	2.65	.01*
Women										
Relating to other	124	5.74	2.28	5.40	2.48	.02	-.25	.93	1.13	.26
New possibilities	124	5.48	2.54	5.44	2.39	.16	-.52	.62	.17	.87
Personal strength	124	6.22	2.44	5.78	2.56	.21*	-.12	1.00	1.54	.13
Spiritual change	124	7.86	1.84	6.90	2.74	.32**	.48	1.46	3.89	.01**
Life appreciation	124	5.39	2.47	4.41	2.13	.05	.41	1.54	3.42	.01**

Note. CI=Class Interval. * $p < .01$, ** $p < .001$

To see the pattern of change in the domains of PTG, Table 50 illustrates that there are statistically significant differences, in T1 and T2 scores for subscales of posttraumatic

growth. There is decline in personal strength (.55 points), spiritual change (.75 points) and life appreciation (.86 points) in T2. However, relating to others and new possibilities remained unchanged with the progress of time. In men, the decline was in the domains of 'new possibilities', 'personal strength' and 'life appreciation'. In women, the decline in T 2 was in the domain of spiritual change ($t=1.44$) and life appreciation ($t=1.54$) subscales of PTG. Findings partially supports our hypothesis that there would be decline in all domains of PTG in T2 as in comparison to T1. Quite contrary to our second hypothesis relating to other and new possibilities remained unchanged across time.

Table 51

Comparison of Coping Strategies across Time 1 and Time 2 (N=239)

Coping Styles	N	Time 1		Time 2		r	95% CI		t	p
		M	SD	M	SD		LL	UL		
Self distraction	237	5.15	1.50	4.89	1.65	.15**	.00	.52	1.96	.05*
Active coping	234	6.31	1.52	5.75	1.62	.13*	.29	.82	4.09	.01**
Denial	234	4.36	1.60	4.32	1.75	.21**	-.23	.31	.28	.78
Substance use	234	2.60	1.32	2.96	1.52	.08	-.61	-.11	-2.84	.01**
Use emotional support	237	4.30	1.49	4.42	1.84	.13*	-.40	.16	-.82	.41
Use instrument support	237	5.72	1.53	5.24	1.56	.08	.21	.75	3.50	.01**
Behavioural disengagement	237	4.26	1.72	3.95	1.58	.12	.04	.60	2.22	.03*
Venting	237	4.49	1.42	4.60	1.56	.12	-.36	.15	-.82	.41
Positive reframing	237	5.77	1.48	5.33	1.72	.02	.15	.73	3.01	.01**
Planning	237	6.08	1.51	5.35	1.71	.20*	.47	.99	5.49	.01**
Humour	237	3.76	1.54	3.89	1.60	.10	-.40	.14	-.92	.36
Acceptance	236	5.63	1.58	5.40	1.59	.11	-.04	.50	1.66	.10
Religion	237	7.14	1.37	6.69	1.57	.12**	.20	.70	3.53	.01**
Self blame	237	4.17	1.76	4.12	1.65	.22*	-.23	.32	.34	.74

* $p<.05$, ** $p<.01$

Table 51 shows the coping strategies such as self-distraction, active coping were significantly decreased in T2 respectively. Self-distraction and active coping decreased to .26 and .55 respectively. Moreover, there is a significant drop in Use instrumental support (.67 points), behavioural disengagement (.32 points), positive reframing (.44 points),

planning (.72 points) and religion coping (.45 points). In addition, substances use coping increased (.26 points) in T2. However, all the other coping strategies remained stable across time. Quite contrary to our hypothesis that coping strategies would more like decline in T2 as in comparison to T1. However, substance use coping would increase in T2 as in comparison to T1. That supports our 5th hypothesis. As we found that out of 14 coping styles seven coping strategies declined, one increased and six remained stable. To see the pattern of decline on PTG inventory, mean scores was calculated of the PTG inventory, Table 52 illustrates the descriptive statistics about the mean differences in T1 and T2 scores shows that there is decline in appreciation in life, new possibilities, spiritual change, relating to others, and personal strength. Decline in mean scores are seen on all the five domains of PTG.

Table 52*Posttraumatic Growth Inventory for Flood Affectees Item-Level Descriptive Statistics at Both Time Points*

	Items	Time 1 (<i>n</i> =327)		Time 2 (<i>n</i> = 239)		Domains of PTG
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
1	“I changed my priorities about what is important in life”	2.11	1.42	1.67	1.35	Appreciation of life
2	“I have a greater appreciation for the value of my life”	3.22	1.46	2.81	1.42	Appreciation of life
3	“I am able to do better things with my life”	3.25	1.41	2.94	1.44	New possibilities
4	“I have a better understanding of spiritual matters”	3.37	1.33	3.12	1.49	Spiritual change
5	“I have a greater sense of closeness with others”	2.81	1.47	2.68	1.51	Relating to others
6	“I established a new path for my life”	2.40	1.67	2.40	1.59	New possibilities
7	“I know better that I can handle difficulties”	3.02	1.40	2.76	1.50	Personal strength
8	“I have a stronger religious faith”	4.10	1.27	3.65	1.53	Spiritual change
9	“I discovered that I’m stronger than I thought I was”	3.34	1.45	3.07	1.47	Personal strength
10	“I learned a great deal about how wonderful people are”	3.03	1.41	2.94	1.49	Relating to others

Note. PTG= Posttraumatic growth.

Table 53*Gender difference in Coping Strategies across Time (N=239)*

Variables	Time 1				Time 2				F	P	η^2
	Men ^a		Women ^b		Men ^c		Women ^d				
	M	SD	M	SD	M	SD	M	SD			
Self distraction	4.83	1.49	5.46	1.47	4.87	1.75	4.88	1.56	4.43	.01	.03
Active coping	6.18	1.66	6.44	1.37	5.90	1.48	5.62	1.73	6.21	.01	.04
Denial	4.18	1.53	4.53	1.65	4.46	1.87	4.21	1.66	1.30	.27	-
Substance use	2.79	1.48	2.41	1.13	3.11	1.61	2.80	1.41	4.84	.01	.03
Use emotional	4.24	1.52	4.35	1.47	4.84	2.14	4.03	1.41	5.06	.01	.03
Use instru. Su.	5.83	1.63	5.61	1.42	5.48	1.65	5.00	1.46	6.29	.01	.04
Behavioural di.	4.13	1.83	4.36	1.61	3.82	1.62	4.05	1.55	2.22	.09	-
Venting	4.51	1.39	4.47	1.45	4.77	1.46	4.43	1.63	1.22	.30	-
Positive refra.	5.66	1.60	5.89	1.36	5.47	1.76	5.17	1.69	4.38	.01	.03
Planning	6.12	1.60	6.05	1.43	5.58	1.71	5.12	1.69	10.05	.01	.06
Humour	3.82	1.55	3.73	1.54	3.90	1.57	3.87	1.63	.28	.84	-
Acceptance	5.62	1.55	5.63	1.61	5.36	1.53	5.41	1.65	.94	.42	-
Religion	7.04	1.45	7.23	1.29	6.69	1.47	6.71	1.66	3.96	.01	.02
Self blame	4.20	1.89	4.14	1.62	4.11	1.73	4.11	1.58	.07	.98	-

Note. Use instru. Su = Use instrumental Support; Behavioural dis.= Behavioural disengagement; Positive refra.= Positive reframing
 $n^a=114, n^b=123, n^c=115, n^d=124$

Table 53 shows the gender differences in coping strategies across time. Results showed that there is a significant difference on the coping strategies such as self distraction coping, active coping, substance use coping, use emotional support coping, use instrumental support coping, positive reframing, planning, and religious coping. To see the significant differences Posthoc analysis is seen in Table 54.

Table 54*Post Hoc Analysis of the Significant Coping Strategies across Time (N=239)*

Variables	(I)Categories Gender	(J)Categories Gender	Mean Difference (I-J)	(i-j)	S.E	LL	UL
Self-Distraction	Men T1	Women T1	Men T1<Women T1	-.63*	.20	0.09	1.16
		Men T2	Women T1> Men T2	.58*	.20	0.04	1.12
		Women T2	Women T2<Women T1	-.59*	.19	0.05	1.11
Active Coping	Men T1	Women T1	Men T1> womenT2	.82*	.20	0.2	1.10
		Men T2	Women T1>women T2	.56***	.20	0.29	1.34
Substance abuse Coping	Men T2	women T2	Men T2> women T1	.69**	.18	.21	1.18
Use emotional support	Men T2	Men T1	Men T2> men T1	.60*	.22	.02	1.18
		Women T2	Men T2> men T1	.81**	.21	.24	1.37
Use instrumental support	Men T1	Women T2	MenT1> women T2	.83***	.20	.30	1.36
			Women T1> women T2	.61**	.19	.09	1.13
Positive Reframing	Women T1	Women T2	Women T1 > women T2	.71**	.20	.17	1.25
Planning Coping	Men T1	Women T2	Men T1>women T2	1.00***	.21	.44	1.55
		Women T1	Women T1>women T2	.93**	.20	.38	1.47
Use of Religious Coping	Women T1	Men T2	Women T1> men T2	.55*	.19	.04	1.05
		Women T2	Women T1> women T2	.53*	.18	.03	1.02

Note. * $p < .05$, ** $p < .01$

In Table 54, ANOVA showed a statistically significant difference on self-distraction coping scores for the four groups: $F(3,238) = 4.43$, $p < .01$, $\eta^2 = .03$. Post-hoc comparisons using the Bonferroni test demonstrated that the mean score for women T1 was significantly different from the rest of the groups. Moreover, statistically significant difference at the $p < .01$ level Active coping scores for the four

groups: $F = 6.21, \eta^2 = .04$. In addition, Post-hoc test indicated that the mean score for women T2 was significantly different from men T1 and women T3. *ANOVA* showed a statistically significant difference at the substance abuse coping scores for the four groups: $F = 4.84, p < .01, \eta^2 = .03$. Post-hoc comparisons showed that the mean score for men T2 was significantly different from men T1. Furthermore, statistically significant difference was seen on the use of emotional support coping scores for the gender groups: $F = 5.05, p < .01, \eta^2 = .03$. Post-hoc comparisons demonstrated that the mean score for men T2 was significantly different from men T1 and women T2.

Results also showed a statistically significant difference at the $p < .01$ level in the use of instrumental support as coping for the four groups: $F = 4.38, p < .01, \eta^2 = .03$. Post-hoc comparisons using the Bonferroni test showed that the mean score for men T1 and women T1 were significantly different from women T2. In addition, a statistically significant difference was seen on the use of positive reframing as a coping scores for the four groups: $F(3, 238) = 4.38, p < .01, \eta^2 = .03$. Post-hoc comparisons test showed that women T1 was significantly different from women T2. Moreover, a statistically significant difference was seen in planning coping scores for the four groups: $F = 10.05, \eta^2 = .06$. Post-hoc comparisons using the Bonferroni test demonstrated that the mean score for Men T1 was significantly different from women T2 and women T2 is significantly different from women T1. In addition, statistically significant difference at the $p < .01$ level was found in religious coping for the four groups: $F = 3.96, \eta^2 = .02$. Post-hoc comparisons demonstrated that the mean score for women T1 was significantly different from men T2 and women T2.

Table 55

Difference of Psychological Distress, PTS, Rumination Patterns, Perceived Social Support, Wellbeing and PTG Changes Over Time 1 and Time 2(N=239)

Variables	Time 1				Time 2				F	P	η^2
	Men ^a		Women ^b		Men ^c		Women ^d				
	M	SD	M	SD	M	SD	M	SD			
Stress	7.35	4.11	7.36	3.96	7.37	4.03	6.92	3.73	.38	.77	-
Anxiety	4.52	4.62	4.43	3.43	5.33	4.46	4.73	3.63	1.15	.33	-
Depression	5.77	4.60	5.56	3.81	6.20	4.31	5.30	3.73	.99	.40	-
PTS	33.57	17.16	35.90	16.58	33.66	18.21	31.24	16.10	1.55	.20	-
Intrusive rum.	14.43	7.90	14.59	7.05	13.81	7.83	13.10	7.04	1.00	.39	-
Deliberate rum.	18.12	6.81	17.18	6.87	15.17	6.76	15.13	7.84	3.44	.02	.03
Family support	21.10	6.10	22.12	5.83	19.95	6.14	19.97	6.25	3.52	.02	.02
Friend support	18.95	5.90	18.66	6.15	19.21	6.03	17.60	6.05	1.62	.18	-
Significant O.S.	16.99	7.94	18.96	7.38	18.15	6.25	17.41	6.66	1.77	.15	-
Wellbeing	23.83	5.99	22.62	6.98	22.41	5.92	22.55	7.33	1.01	.39	-
PTG	30.61	10.25	30.66	8.42	28.25	9.99	27.81	9.35	3.02	.03	.03
Relating others	5.97	2.29	5.74	2.28	5.90	2.45	5.40	2.48	1.37	.25	-
New Possib.	5.79	2.59	5.48	2.54	5.23	2.65	5.44	2.39	.95	.42	-
Personal Stren.	6.56	2.53	6.22	2.44	5.90	2.76	5.78	2.56	2.14	.09	-
Spiritual Chan.	7.08	2.60	7.86	1.84	6.68	2.54	6.90	2.74	5.35	.01	.05
Life Apprec.	5.27	2.54	5.39	2.47	4.58	2.50	4.41	2.13	4.90	.01	.03

Note. Intrusive rum.= Intrusive Rumination; Deliberate rum.= Deliberate Rumination; New Possib.= New possibilities; Significant O.S.= Significant Other Support; New Possib.=New Possibilities; Personal Stren.= Personal Strength; Spiritual Chan.= Spiritual Change; Life Apprec.= Life Appreciation

$n^a= 112$, $n^b= 124$, $n^c= 112$, $n^d= 123$

Table 55 shows that in T1 deliberate rumination were higher among men as compared to women in T1 and the results are significant. Family support in T2 decreased in T2. Significant changes are seen in PTG and its domains spiritual change and life appreciation. Details of Posthoc analysis are illustrated in Table 56.

Table 56*Post hoc analysis of Rumination Patterns and PTG Changes across Time (N=239)*

Variables	(I)Categories Gender	(J) Categories Gender	Mean Difference (I-J)	(i-j)	S.E	LL	UL
Deliberate rumination	Men T1	Men T2	Men T1>Men T2	2.94*	1.07	0.11	5.78
Family support	Women T1	men T2	Women T1> Men T2	2.17*	.79	0.08	4.27
		women T2	Women T1>women T2	2.15*	.78	0.09	4.21
Spiritual change	Women T1	Men T2	WomenT1> men T2	1.18**	.32	.34	2.02
			Women T1> women T2	.97**	.31	.14	1.79
Life appreciation	Men T1	Women T2	Men T1 > women T2	.86*	.31	.02	1.68
	Women T1	Women T2	Men T1>women T2	.97**	.30	.16	1.78

In Table 56, Analysis of variance showed a statistically significant difference at the $p < .05$ level in Deliberate rumination scores for the four groups: $F(3,237) = 3.44$, $p < .05$, $\eta^2 = .03$. Post-hoc comparisons using the Bonferroni test showed that the mean score for Men T1 was significantly different from men T2. In addition, statistically significant difference was found in Social support scores for the four groups: $F = 3.52$, $p < .05$, $\eta^2 = .03$. Post-hoc comparisons illustrated that the mean score for women T1 were significantly different from men T2 and from women T2. For the results of PTG, as they were significant in at .03, but in Post hoc analysis, there was no significant differences, it may be because that the Bonferroni has the correction factor added in it. Moreover, a statistically significant difference at the $p < .05$ level in subscale of Spiritual change scores for the four groups: $F = 5.35$, $p < .01$, $\eta^2 = .03$. Post-hoc analysis showed that the mean score for women T1 were significantly different from men T2 and from women T2.

There is statistically significant difference in subscale of Life Appreciation, domain of PTG scores for the four gender groups: $F(3,237) = 4.90, p < .01, \eta^2 = .03$. Post-hoc comparisons using the Bonferroni test showed that the mean score for men T1 were significantly different from women T2 and women T1 were significantly different from women T2.

Predicting posttraumatic Growth T2 from Time 1 study Variables

To see the predicting role of PTS, rumination and distress for the prediction of PTG T2, hierarchical regression analysis was conducted. We conducted the hierarchical regression analysis because PTG theory and previous literature has already identified the cross sectional and longitudinal predictors of PTG. So we entered the predicting variables in the model according to their predicting role.

Table 57

Hierarchical Regression Analysis for Variables Predicting PTG in Time 2 Controlling the effect of Posttraumatic Stress and Distress in Time 2

Variables	Self-reported PTG Time 2			
	Model 1B	Model 2B	Model 3	95 % CI
(Constant)	32.74*	18.10	14.62	[7.71, 57.77]
Gender	-.22	-.74	-.94	[-4.32, 3.88]
Age	-.01	-.06	-.03	[-.31, .29]
Education	-.02	.37	.37	[-1.40, 1.36]
Marital status	-.76	1.52	1.07	[-6.28, 4.76]
Employment status	-2.35	-.65	-1.54	[-7.20, 2.50]
Flood Exposure	.08	.04	-.03	[-.14, .30]
Distress Time 2		-.26*	-.21	[-6.78, 42.97]
PTS Time 2		.10	.07	[-4.57, 3.08]
Intrusive rumination Time 2		-.07	-.06	[-.34, .22]
Deliberate rumination Time 2		.57**	.52*	[-.96, 1.69]
Distress Time 1			-.01	[-3.73, 6.76]
PTS Time 1			.09	[-5.26, 3.95]
Intrusive rumination Time 1			-.03	[-.17, .26]
Deliberate rumination Time 1			.19	[-.47, -.05]
Posttraumatic Growth Time 1			.26*	[-.09, .28]
R ²	.02	.19	.25	
F	.27	2.16*	1.87*	
ΔR^2		.18	.05	
ΔF		.001	.30	

Note. $N=229$. CI= confidence interval. Posttraumatic stress= PTS

* $p < .05$, ** $p < .001$

Table 57 describes the hierarchical multiple regression. Before running a hierarchical multiple regression, the fundamental assumptions of this analysis were assessed. We looked the collinearity among the variables. In addition, Durbin-Watson test was used to examine whether the residuals in the model are independent. Firstly, the sample was deemed adequate for this analysis (Tabachnick & Fidell, 2001). Residual and scatter plots analysis showed that the assumptions of linearity, normality, and homoscedasticity were all satisfactory (Field, 2009). An examination of the Mahalanobis distance scores demonstrated no multivariate outliers.

A three stage hierarchical multiple regression was computed with PTG T2 as the outcome variable. Demographic variables such as gender, age, education, employment status, marital status and level of exposure to flood, were entered at stage one of the regression to control for their effect. To see the predicting role of the T1 variables PTS T2, Distress T2, intrusive ruminations T2 and deliberate ruminations T2 were controlled and were entered at stage two for controlling their effect and predictors of PTG T2 (PTS T1, Distress T1, intrusive rumination T1, Deliberate rumination T1, PTG T1 at stage three.

The hierarchical multiple regression demonstrated that at stage one, demographic variables did not significantly contributed to the regression model, $F(6,223) = .27, p=ns$. Controlling the PTS, distress, intrusive and deliberate ruminations, the distress T2 negatively predicted the PTG ($\beta = -.29$) and deliberate rumination T2 predicted the PTG ($\beta = .47, p<.05$) and explained the 18 % of variation in PTG and this change in R^2 was significant, $F(10, 219) = 2.16, p < .05$. Adding the predictors to the regression model explained an additional .05 % of the variation in PTG. PTG T1 significantly predicted ($\beta =.26, p<.05$) the PTG T2. This change in R^2 was significant, $F(15, 214) = 1.87, p < .05$. From Time variables, together the independent variables accounted for 25% of the variance in PTG. Model II illustrates that intrusive rumination at T1 is the significant predictor of posttraumatic stress symptoms, whereas deliberate rumination is the predictor of PTG at T1. PTS at T1 is accounts the 33 % of variance in PTS at T2 and PTS in T1 accounts for 25 % of the variance in PTG T1. PTG in T1 accounts for 26% of variance in PTG T2. Moreover, PTS in T2 accounts for 26 % of variance in PTG T2. Results support our hypothesis

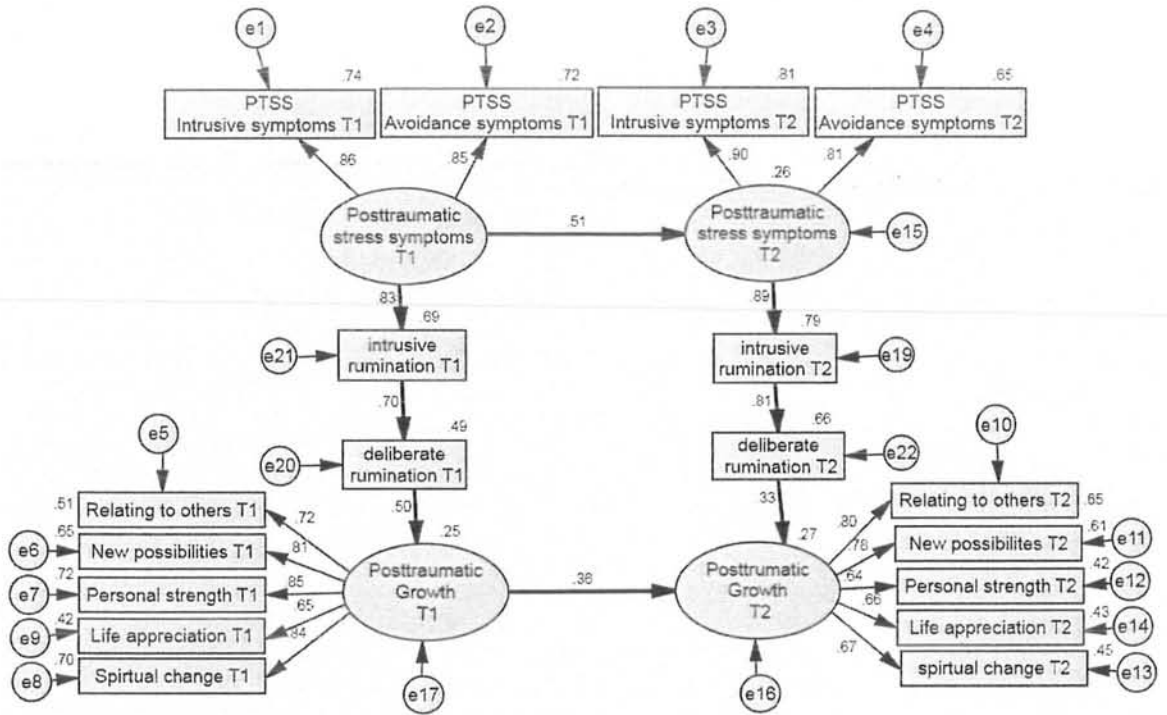


Figure 15. Trajectory of posttraumatic stress and posttraumatic growth from Time 1 to Time 2 among men

Table 58

Indices of Model Fitness (N=239)

Model Number	χ^2 (df)	IFI	TLI	CFI	RMSEA	$\Delta \chi^2$ (df)	p
Model 1 (N=239)	542(262)	.93	.91	.93	.05	-	.001
General model							
Model 2 (gender) (unconstrained)	861(524)	.92	.93	.90	.05	326 (262)	.12

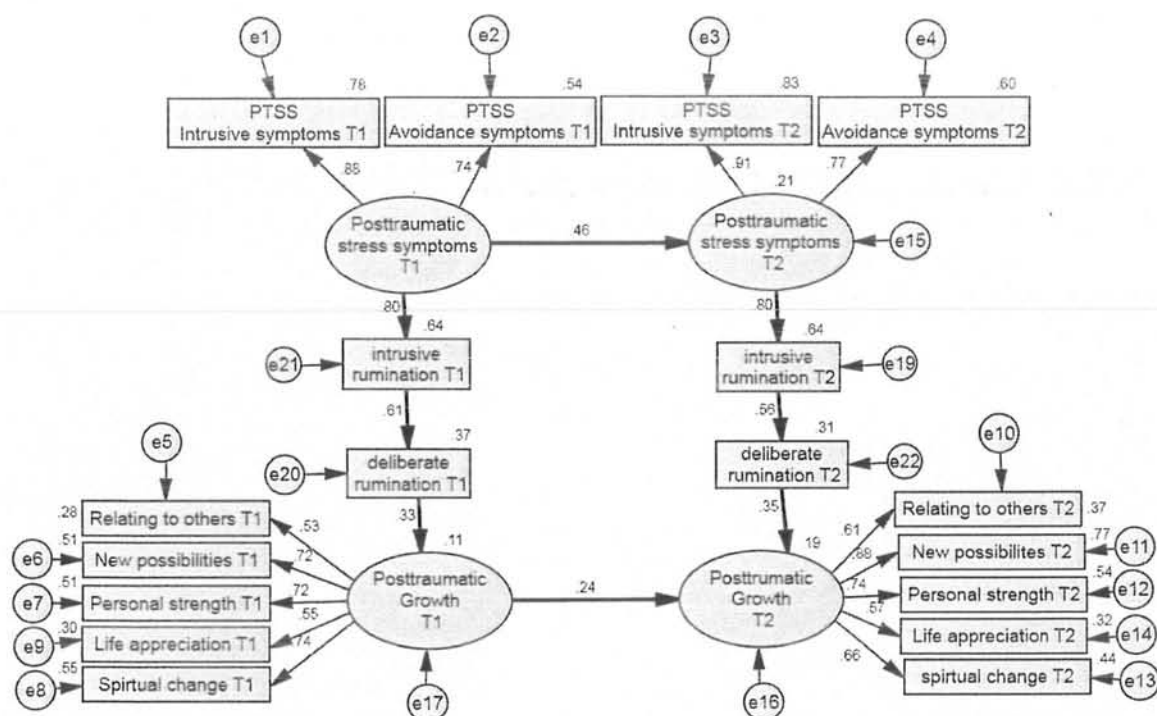
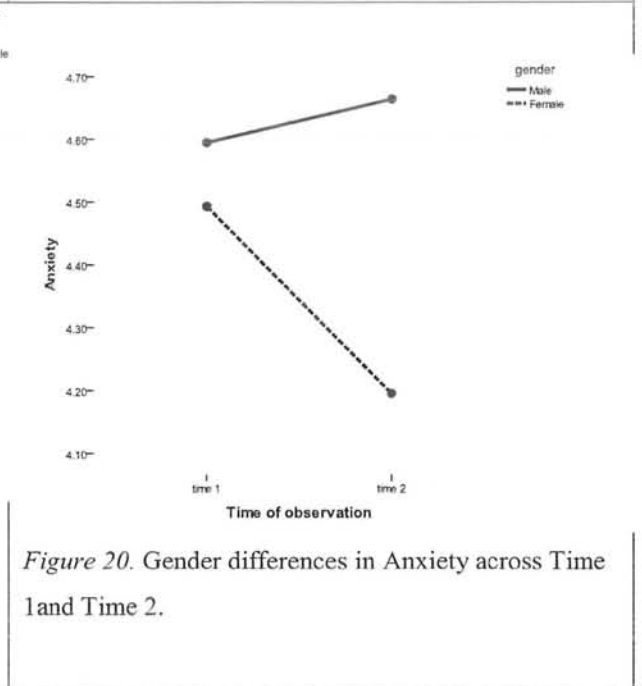
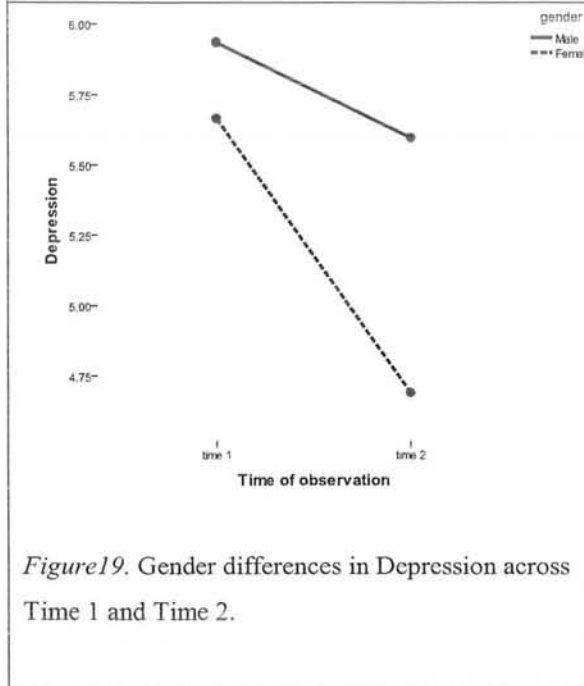
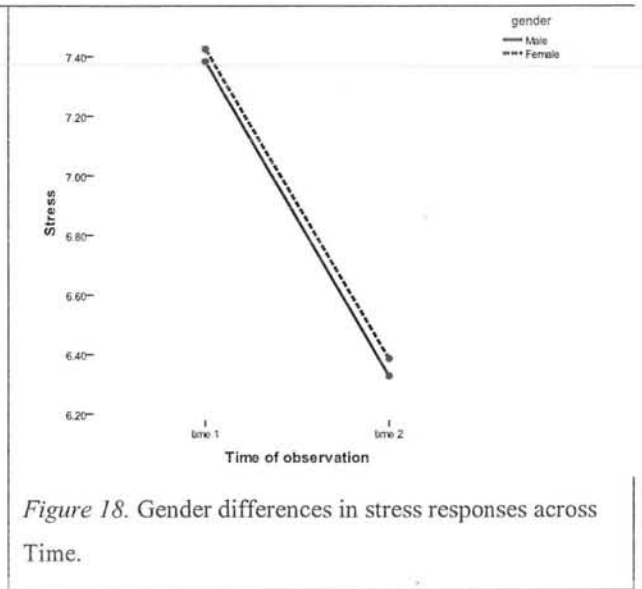
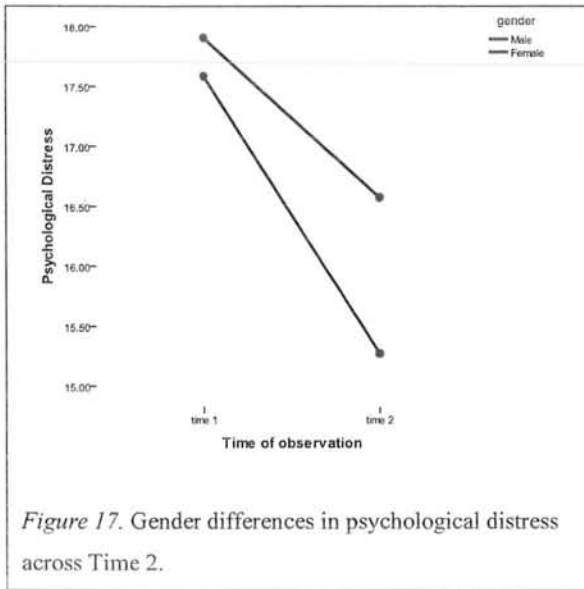


Figure 16. Trajectory of PTS andPTG across T1 to T2 among women

To see the cross sectional and longitudinal paths between posttraumatic stress symptoms and PTG, arrows in boldface shows the significant paths. Cross sectional paths showed that PTS T1 predicted intrusive ruminations. Intrusive ruminations T1 predicted deliberate ruminations T1 and deliberate ruminations T1 predicted PTG T1. Similarly, in second cross sectional path, PTS T2 predicted intrusive ruminations T2, intrusive ruminations T2 predicted deliberate ruminations T2 and the deliberate ruminations T2 significantly predicted PTG T2 and the predictors of PTG T2 explained 24 % of variance. To see the longitudinal path across time, PTS T1 was the significant predictor of PTS T2 ($\beta = .48, p = .001$) and explain 23 % of variance in PTS T2. Moreover, PTG T1 was the significant predictor of PTG T2 ($\beta = .30, p = .001$) and overall the model explained 24 % of variance in PTG T2. In all three models all the

cross sectional and longitudinal paths are significant. This suggested that the model can be generalized on both genders.

Comparison of Distress, PTS, Rumination, and PTG over two time points



Figures 17 to 20 show the decline of distress and stress responses across T1 and T2. However, they showed with some variation of the patterns of decline. In

graph, 17 and 18 there is sharp decline in psychological distress, and stress whereas, in Figure 19, for depression there is sharp decline for women, but in men depression still seems to be present in T2. For Anxiety, which is depicted in Figure 20, the patterns of change from T1 to T2 are contrary. For men Anxiety increased in T2. The possible reason could be that men have the economic responsibility of their family or have to generate the resources that are why they are more apprehensive and anxious.

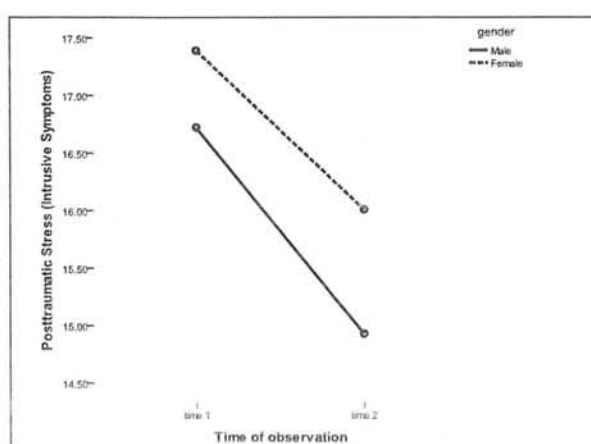


Figure 21. Differences in PTS (intrusive symptoms) across Time 1 and Time 2.

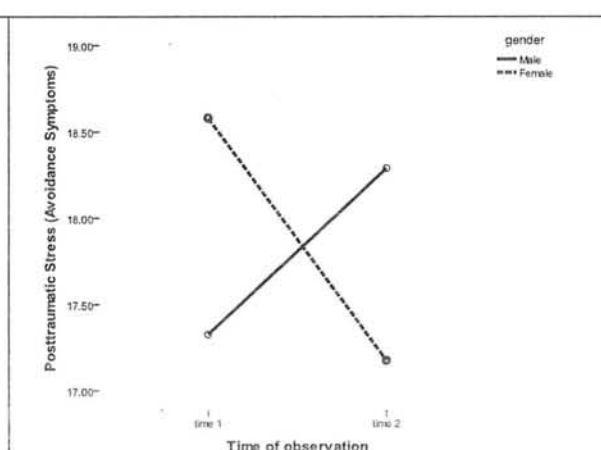


Figure 22. Differences in PTS (Avoidance symptoms) across Time 1 and Time 2.

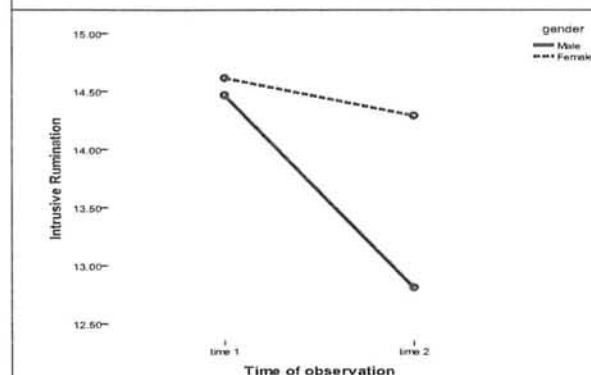


Figure 23. Gender differences in intrusive rumination) across Time 1 and Time 2.

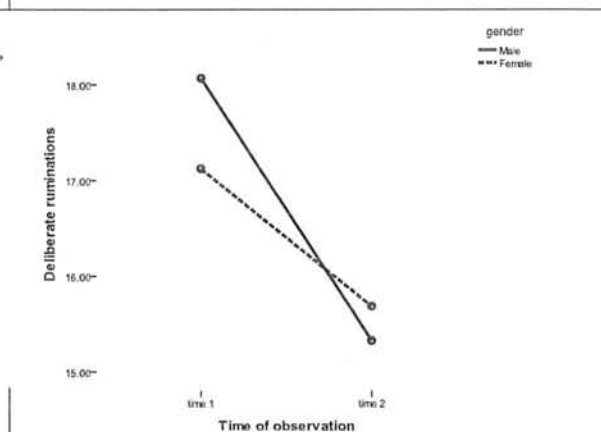
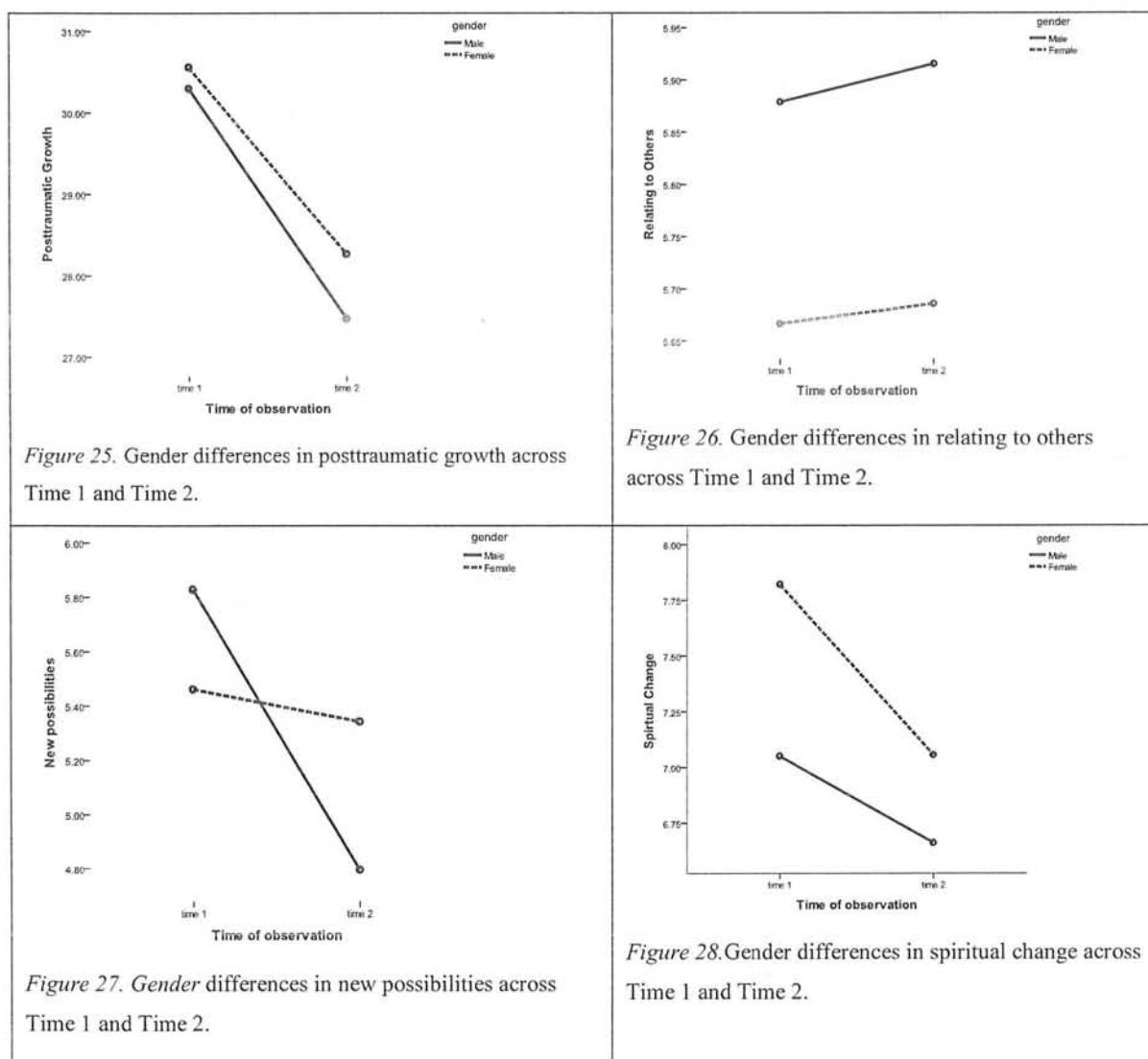


Figure 24. Gender differences in Deliberate ruminations across Time 1 and Time 2.

Figure 21 and 24 show the changes in the patterns of PTS Intrusive symptoms and Avoidance symptoms. Intrusive symptoms declined in T2, whereas, PTS

avoidance symptoms increased in T2 in men. Figure 23 and 24 shows that change in the rumination patterns across time decline in intrusive rumination in T2. Intrusive rumination decrease more in women as compare to men in T2, whereas deliberate rumination is also declining with the time. From Figures 25 to 28 the patterns of changes in PTG from T2 to T1 has been depicted. There is decline in PTG and its subscales (i.e., personal strength, spiritual change, life appreciation, and identifying new possibilities).



DISCUSSION

The objective of the T2 was to see the pattern of changes and difference of PTS, distress responses, rumination patterns, coping mechanisms and PTG across time (over T1 to T2) among individuals exposed to 2010 floods in Pakistan. Moreover, it aimed to see the longitudinal predictors of PTS and PTG. Based on the previous literature, we hypothesized that PTS, psychological distress, flood related rumination, and PTG would more likely to decline in T2 as in comparison to T1. Moreover, psychological distress, PTS, flood related ruminations, and PTG would decline with the passage of time in both the genders. It was expected that the relationship between the T2 variables would follow the same trend that was followed during T1.

For T2, for data collection, district Mianwali, was selected purposefully. As compared to the other areas, this area has the more representative sample of both the genders as compared to the other areas from where the data of the T1 was taken (See Fig 2). From this region, there was almost equal participation of both the genders during the T1 of the study. For instance, from this region 327 individuals participated at T1, with 181 (55.33 %) men and 146 (44.65%) women. Moreover, 239 individuals from this region have been participated at T2, with 115 (48.1 %) men and 124 (51.9%) women (detail of the demographic information of the second time point data can be seen in Chapter 2, under the heading of Sample). All the measures that were used in T1 were used in the T2. However, demographic information that was already taken during T1 of the study was not taken again and the Flood Related Exposure

Scale (FRES) was also excluded. The reason was that the level of exposure to flood had already been taken during T1.

For T2 data analysis, bivariate correlation was computed to examine associations between key variables at both times. Paired sample *t*-test was computed to see the difference in T1 and T2. One Way ANOVA was computed to see difference across groups. For Regression Analysis, assumptions of univariate and multivariate normality were tested. Diagnostic tests of multicollinearity were also conducted, and examination of correlation analysis showed that no predictor variables were highly correlated with each other. SEM was done for model testing.

Comparison of PTS, Distress, Rumination and PTG across T1 and T2

To see the comparison of study variables across T1 and T2, paired sample *t*-test depicted a statistically significant decrease in PTS from T1 to T2 and also decrease in PTS intrusive symptoms, intrusive rumination, deliberate ruminations and PTG. However, psychological distress and PTS avoidance symptoms remained unchanged with the progression of time. While seeing the gender difference on the changes in study variables across time, results showed that among male deliberate rumination and PTG decreased in T2. The findings are in line with the past literature that demonstrated the decrease in stress symptoms with time after exposure to a stressful event such as a flood. Past literature showed that most of the symptoms of distress dissipate with time. For example, trauma literature demonstrated that PTS and distress responses are highest immediately after the trauma and then gradually subsided. For instance, about 90 per cent of individuals typically show a PTSD profile immediately after a big trauma, however, after a few months, a vast majority no

longer show these symptoms (Breslau, Troost, Bohnert, & Luo, 2013; Meyerson et al., 2011).

Our findings are corroborated with the research that showed that PTSD declined from 59.5% to 11.9% between the first assessment and the follow-up, although the severity of intrusive and hyper arousal symptoms diminished over time, the severity of avoidance symptoms stayed unchanged (Vloet et al., 2014; Wu & Cheung, 2006). Moreover, our findings confirm the previous literature that both the depreciation in PTG and depreciation in PTS and distress symptoms do occur simultaneously (Baker, Kelly, Calhoun, Cann, & Tedeschi, 2008; Park & Lechner, 2006; Tedeschi & Calhoun, 1996; Nishi et al., 2010; Sattler et al., 2014; Tomich & Helgeson, 2004).

To see the pattern of change in PTG domains, quite consistent with our hypothetical assumption we found that, in women, PTS intrusive and avoidance symptoms of intrusive rumination, deliberate ruminations and PTG decreases with time. Item wise descriptive statistics about the mean differences in T1 and T2 scores showed that there is decline in appreciation in life, new possibilities, spiritual change, relating to others, and personal strength. Decline in mean scores are seen on all the five domains of PTG (Table 50). These findings are aligned with the PTG theorists, who showed that gender differences have levelled off with the passage of time. It was also found that there were statistically significant differences, in T1 and T2 scores for subscales of PTG. There was the decline in personal strength, spiritual change, and life appreciation in T2 as comparison of T1. However, relating to others and new possibilities remained unchanged with the progress of time. In men, the decline was in the domains of new possibilities, personal strength and life appreciation. In women,

the decline in T2 was in the domain of “spiritual change” and “life appreciation” subscales of PTG.

To see the changes of PTG across time, we found that PTG declined in T2. Hence, regarding changing patterns of PTG our findings are supported by the literature that demonstrated that the PTG decline with the passage of time. In the previous literature, it has been an important question that what is the nature of change in PTG? To answer the question whether the PTG increase with time, decrease with time or stable. There are mixed findings in literature, Frazier, Conlon, and Glaser (2001) believed that the PTG increases with time, while others demonstrated that PTG decreases with time. For instance, Tartaro et al. (2005) found the women who scored high on PTG, their levels of distress declined over time. However, PTG increased to moderate levels initially first 16 months after diagnosis of the illness, and then leveled off (Danahauer et al. 2015). However, some others (Davis & Macdonald, 2004; Helgeson et al., 2006; Moore et al., 2011; Powell, Gilson, & Collin, 2012) believed that it is relatively stable phenomena over the first 6 months and changes with the passage of time.

Our findings are consistent with the (Tartaro et al., 2005) that demonstrated that the PTG decreases with time. Leong and Abdullah (2015) also reported the significant reductions in the scores of PTGI-SF, depression, and anxiety from baseline to follow-up. Put it another way, studies suggesting that growth may decline over time. Hence, it is suggested that soon after the event there is high stress and growth, however, with the progression of time both stress and PTG decline. There is almost an agreement among researchers that growth does not significantly increase with time.

However, the difference of the patterns of PTG may be understood with the reference of heterogeneity of the sample.

Comparison of Coping Strategies across T1 and T2

Coping strategies such as self-distraction coping and active coping were significantly decreased in T2. Moreover, there is a significant decline in the coping strategies such as use instrumental support, positive reframing, behavioural disengagement, planning and religion coping. In addition, substances use coping increased in T2. This suggests that substance use coping increases with the passage of time among the individuals exposed to a natural disaster. While, denial, venting, use emotional support, humour, and self blame remained unchanged (Table 51). Our findings are partially consistent with those researches that showed the similar trends. For instance, Pollard and Kennedy (2007) reported the coping strategies would remain stable during the time. However, past studies showed that after exposure to disaster substance abuse among the population is increased. Besides, we found that from T1 to T2 there is gradual decline in PTS, distress and PTG. It appears that the symptoms are reduced without any noticeable interventions. Only the time or merely the rumination seems to be the factor that serves as solace while many people handle the consequences of adversity without any major psychopathology (Bonanno, 2006; Pollard & Kennedy, 2007). Moreover, middle aged survivors had the most difficulty in coping because they are more likely to be responsible for both parents and children. Secondly, they are approaching to retirement, hence the material and financial threats may shatter their dreams and make them insecure about the future (Norris Phifer, & Kaniasty, 1994).

Correlations between the T1 and T2 Study Variables

To see the associations between T1 and T2 study variables, we found that distress T1 was positively associated with the distress T2, PTS T2, intrusive rumination T2, Deliberate rumination T2. PTS T1 was positively associated with PTS T2, intrusive and deliberate rumination T2 and PTG T2. The PTG T1 is significantly positively associated with intrusive rumination T2, deliberate Rumination T2 and PT2. Bivariate correlation between the subscales of PTG T1 and subscales of PTG T2 showed the positive correlation. Values of correlation are ranged from .12 to .62 (See Table 48) and are inline with previous literature (Cadell et al., 2003; Schaefer & Moos, 1998; Weiss, 2004; Wolchik et al., 2009; Xu & Liao, 2011). Moreover, it has suggested the predictive role of PTS, distress and PTG T1.

To see the relationship between PTG T2 and coping mechanisms, findings showed that PTG T2 was significantly positively correlated with active coping, denial coping, use emotional support, use of instrumental support coping, planning, positive reframing, acceptance coping, and religion coping. Whereas, PTG negatively associated with substance use coping. These findings are partially consistent with the studies that showed the relationship between coping strategies and PTG (Kastenmuller et al., 2012; Linely & Joseph, 2006; Tedeschi & Calhoun, 1995).

Predictive Role of T1 study variables in the prediction of PTG T2

To see the predicting role of T1 variables such as PTS, distress, intrusive and deliberate rumination and PTG to the prediction of PTG T2, a three stage hierarchical multiple regression was conducted with PTG T2 as the dependent variable. Demographic variables and the effect of potentially confounding variables were

controlled. The results revealed that at stage one, demographic variables did not significantly contribute to the regression model. Controlling the PTS, distress, intrusive and deliberate ruminations, the distress T2 negatively predicted the PTG and deliberate rumination T2 predicted the PTG and explained the 18 % of variation in PTG. PTG T1 significantly predicted PTG T2 and together the independent variables accounted for 25% of the variance in PTG. Moreover, PTS T1 accounted the 33 % of variance in PTS at T 2 and PTS T1 accounted the 25 % of the variance in PTG T1. PTG T1 accounted the 26% of variance in PTG T2 (See Table 57). Our findings are partially aligned with previous literature (Dekel et al., 2011; Tomich & Helgeson 2012; Wang et al., 2013; Wolchik et al., 2008; Yi & Kim, 2014; Zebrack et al., 2014). For instance, Kilmer et al. (2009) found that PTS significantly explained variance in PTG. At follow-up, T1 PTG was the only significant predictor of PTG T2. In addition, Pakenham (2005) found that after controlling for the effects of demographics, time 1 variables significantly predicted the T2 PTG.

Model Testing

To see the cross sectional and longitudinal paths between PTS and PTG model testing was done. Cross sectional paths showed that PTS T1 predicted intrusive rumination. Intrusive rumination T1 predicted deliberate rumination T1 and deliberate rumination T1 predicted PTG T1. Predictors of PTG T2 explained 18 % of variance. Similarly, in second cross sectional path, PTS T2 predicted intrusive rumination, intrusive rumination predicted deliberate rumination and the deliberate rumination significantly predicted PTG T2 and the predictors of PTG T2 explained 24 % of variance. To see the longitudinal path across time, PTS T1 was the significant

predictor of PTS T2 and explained 23 % of variance in PTS T2. Moreover, PTG T1 was the significant predictor of PTG T2 and overall the model explained 24 % of variance in PTG T2. Same the pattern was followed by both the genders. These findings are inline with the literature that demonstrated the trajectory of PTS and PTG (Dong et al., 2014; Rajkumar, Mohan, & Tharyan, 2013).

T2 results suggested that cognitive processes, rumination patterns, social environmental factors and coping strategies used by the survivors are essential in understanding the changing patterns of trauma and PTG than the mere passage of time. These results are consistent with the PTG theory that states that trauma shatters the fundamental assumptions and invokes the rumination. So the first time after exposing to the trauma may be more challenging to the individual and may trigger thought processes that are initially more intrusive and later on deliberate in nature. Our findings are also consistent with the growth over time hypothesis that the relationship between PTG and PTS is initially a positive one, but becomes negative over time (Zalta et al., 2017).

Limitations and Recommendations

There are certain limitations of the T2 of the study. For example, the results of the present study are only about those participants who continued living in the flood affected area and data on those individuals who moved out of that area before the data collection of the second time point was not available. However, differential drop out analysis of T1 and T2 sample showed that the drop out sample was not significantly different from the retained sample. Furthermore, it was depended exclusively on “retrospective” self-reports of flood affected participants, which were often subject to social desirability or recall biases. Owing to resource constraints, third-party reports

were not available for the external validation. We collected the T2 data after the time space of six months. Six months seems to be a relatively short time to fully examine the stability or change in rumination patterns or the development of PTG, as many intervening variables may affect the pattern of change.

However, much additional research would be helpful to examine whether prior exposure to traumatic life events helps or impedes the growth. The study did not use the random sampling, so it is hard to draw any conclusive inferences about the flood-related PTS or distress in the general population. Further longitudinal research by using random sampling is needed to maximize the generalizability of findings and to see how psychosocial, environmental, and personality factors influence the association between PTS and PTG. Because, it is still not clear to what extent psychological distress, PTS, or PTG were results of the current flood or other underlying pre-existing factors.

In addition, hope and optimism represent important indicators for PTG. For this, Snyder's Hope Scale can be used to assess hope. Future research should use qualitative methodology to expand on our research findings, as well as assess interventions to assist flood affected individuals. Additional research will help across different types of disasters that give a much clear picture of the ways distress responses, rumination patterns, and growth responses are changed over time. Further prospective longitudinal studies are needed to further evaluate whether pre-existing personality traits, maturation, and cognitive processing can predict growth after trauma over the time span and to understand how individuals develop positive traits as both protective and coping mechanisms (Vieselmeyer, Holguin, & Mezulis, 2017).

Conclusion

Trauma theorists suggests that posttraumatic stress and growth increase early on and level off (to reach a level and become stable and unchanging) with the passage of time. However, it was demonstrated that PTG, PTS, distress and flood related rumination dissipated and depreciated with time. Moreover, depreciation in PTG, PTS and distress symptoms do occur simultaneously. Despite the fact that change in growth domains followed diverse courses with some variability in changing patterns. Results also underscored the importance of understanding the critical role of ruminations patterns, coping mechanisms, available social support, and other socio-cultural factors that may have a role in the changing of PTS, distress, and PTG. It is however, evident that PTS and distress responses declined in T2 as in comparison to T1 without any apparent psychological interventions. This demands a relatively deeper look of much more intricate interplay of psychological (personality characteristics), environmental (trauma characteristics) social, cultural and demographic factors and the nature of relationship between an individual and extended culture that bear on a person's emotional health. Hence, cognitive processes and individual characteristics seem to be essential in understanding the changing patterns of trauma and PTG than the mere passage of time.

THIRD TIME POINT OF THE STUDY

Objectives

The aim of the T3 of the study was to explore the trajectory of PTS, distress responses, rumination patterns, coping strategies and PTG over three time points (i.e., T1, T2, and T3).

Hypotheses

Based on the previous literature, the following hypotheses were formulated.

1. PTS T1, T2, distress T1, T2, intrusive rumination T1, T2, deliberate rumination T1, T2, social support T1, T2, psychological wellbeing T1, T2, and life satisfaction T1, T2 will be positively associated with the PTS T3, distress T3, intrusive rumination T3, deliberate rumination T3, social support T3, psychological wellbeing T3, and life satisfaction T3 respectively.
2. Psychological distress T1, T2 and T3 will be negatively associated with the PTG T3
3. PTS T1, T2 and T3 will be positively associated with the PTG T3
4. Intrusive rumination T1, T2 and T3 will be positively associated with the PTS T3
5. Deliberate rumination T1, T2 and T3 will be positively associated with the PTG T3
6. Flood Related Rumination, PTS, psychological distress, and PTG will more likely decline in T3 as in comparison to T1 and T2.

7. Coping strategies like positive reframing, active coping, and social support will be positively associated with the PTG however, substance abuse coping, and self-blame coping will be negatively associated with the PTG T3.
8. Intrusive/deliberate rumination T1, T2 and T3 will predict the PTG T3

Sample

For the T3, sample comprised of 153 individuals, 90 women and 63 men (86 [35.98] individuals could not be located from T2 data) were taken from the District Mianwali, Punjab. There were only three individuals who were not located at T2 were present at T3 data. These 3 cases were excluded. The age range of the participants was 16 to 64 years ($M=26.82$, $SD=9.60$). For T3 data was collected during February, 2014. In mid of August 2013 again the Mianwali Villages were stricken by another flood and same population had undergone the flood again. However, the intensity of the flood was not that much of the flood 2010.

Table 59

Descriptive Statistics and the Demographic Characteristics of the Sample in T3 (N=153)

Variables	<i>f</i>	%
Gender		
Male	63	41
Female	90	59
Education		
Matriculation	7	5
Intermediate	83	54
Graduation	42	27
Masters	21	14
Marital Status		
Unmarried	102	67
Married	51	33
Employment Status		
Employed	49	32
Unemployed	99	65
Missing	05	03

Procedure

Procedure for the data for T3 was more or less the same as used for the taking information at T2. The already trained enumerators were again contacted. However, Informed consent was taken from the participants. The nature and purpose of the study was again explained to study participants. They were assured that the data they will provide would only use for the research purpose. They were given the assurance that they can quit at any stage of the study. After data collection, participants were thanked for their cooperation.

Instruments

For data collection of the T3 of the study, Depression Anxiety and Stress Scale (Lovibond & Lovibond, 1995); Impact of Event Scale (Horowitz et al., 1979); Event Related Rumination Inventory (ERRI; Cann et al., 2011); Short form of Posttraumatic Growth (PTG-SF; Cann et al., 2010); Well-Being Questionnaire (W-BQ12; Bradley, 2001), Multi Dimensional Scale of Perceived Social Support (Zimet et al., 1988), Satisfaction with life Scale (Diener et al., 1985) and Brief COPE (Carver, 1997) were used. Psychometric properties of the instruments are reported in Table 60.

RESULTS

Descriptive statistics and bivariate Correlation was computed to examine associations between key variables at three times points. ANOVA was computed to see difference across groups. The analysis was done by using Predictive Analytics Software (PASW) 18. For Regression Analysis, both univariate and multivariate normality assumptions were tested. Diagnostic tests of multicollinearity were also conducted, and examination of correlation analysis demonstrated that no predictor variables were highly correlated with each other. In addition, the assumptions of multicollinearity have been met. The collinearity statistics were all within accepted limits. For Model testing, Structural equation Modeling (SEM) was done by using Analysis of Moment Structures (AMOS 16) and the latent curve Growth model was used to see changes in the growth pattern across time span. Pearson correlations were computed to see the relationship between PTS and PTG, both cross-sectionally as well as longitudinally.

Table 60

Alpha Coefficients and Psychometric Properties of the Scales Used in 3rd Time Point (N=153)

Scales	Item	M	SD	α	Ranges		Skew
					Potential	Actual	
Depression, Anxiety, Stress Scale	21	18.76	11.22	.91	0-63	0-52	.39
Subscale Stress	7	6.88	3.33	.84	0-21	0-19	.46
Subscale Anxiety	7	5.21	4.01	.83	0-21	0-20	.69
Subscale Depression	7	5.11	3.86	.82	0-21	0-19	.83
Impact of event scale (IES)	15	33.15	16.12	.87	0-75	3-74	.08
Subscale Intrusive	7	16.29	8.78	.84	0-35	1-33	.61
Subscale Avoidance	8	18.11	9.05	.83	0-40	3-40	.19
Intrusive Rumination	10	15.38	6.66	.86	0-30	0-29	.07
Deliberate Rumination	10	16.72	6.38	.84	0-30	2-30	.18
Posttraumatic Growth Inventory	10	30.43	8.54	.78	0-50	11-47	.09
MPSSS	12	54.07	16.41	.92	12-84	12-82	-.41
Family support	4	18.55	5.99	.86	4-28	4-26	-.82
Friend support	4	17.86	6.02	.83	4-28	4-27	-.58
Significant other support	4	17.44	7.22	.81	4-28	4-28	-.41
Satisfaction with Life Scale (SWL)	5	21.06	6.92	.79	5-35	5-34	-.24
Brief COPE	28	67.98	10.54	.77	0-112	33.2-109	-.44
Wellbeing Questionnaire (WBQ-12)	12	20.86	5.40	.71	0-36	0.9-36	.26
Positive Wellbeing	4	5.16	2.24	.83	0-12	0-11	.73
Negative Wellbeing	4	4.13	2.75	.72	0-12	0-11	.77
Energy Wellbeing	4	6.83	2.31	.74	0-12	1-12	.38

Table 60 shows the Alpha reliability, mean, standard deviations, skewness, actual and potential ranges of measures used in the study. The values of alpha are ranged from .71 to .92. The reliabilities are in satisfactory ranges. The values of skewness are in acceptable ranges (i.e., less than ± 1) and depicted that the data is normally distributed (Field, 2009).

Correlation between the T3 Study Variables

To see the relationship between the study variables correlation analysis was conducted.

Table 61*Correlation between Distress, PTS, Intrusive, Deliberate Rumination, and PTG at Three Time Points*

Variables	-	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Distress T1		.38**	.13	.41**	.19**	-.02	.43**	.23**	.08	.26**	.12	.06	-.13*	-.09	-.01
2 Distress T2			-.01	.24**	.49**	.03	.32**	.51**	.09	.20**	.48**	.02	.05	-.02	-.09
3 Distress T3				.27**	.20*	.42**	.21**	.17*	.38**	.12	.07	.27**	.04	-.03	-.06
4 PTS T1					.47**	.18*	.73**	.31**	.15	.56**	.30**	.12	.28**	.17**	.04
5 PTS T2						.14	.37**	.77**	.16*	.32**	.68**	.16	.22**	.27**	-.00
6 PTS T3							.10	.07	.82**	.15	.21	.50**	.17*	.10	.25**
7 Intru. ruT1								.35**	.12	.65**	.37**	.01	.32**	.14*	-.03
8 Intru. ruT2									.10	.32**	.72**	.05	.24**	.23**	-.10
9 Intru. ruT3										.12	.24*	.47**	.08	.09	.20*
10 Deli. ruT1											.40**	-.04	.42**	.15*	-.04
11 Deli. ruT2												.19	.31**	.35**	.21*
12 Deli rumT3													-.02	.10	.40**
13 PTG T1														.33**	.27**
14 PTG T2															.46**
15 PTG T3															
<i>M</i>	17.53	17.90	18.76	34.79	32.41	33.15	14.51	13.44	15.38	17.63	15.15	16.72	30.64	28.02	30.43
<i>SD</i>	11.10	10.87	11.22	16.86	17.16	16.12	7.46	7.42	6.66	6.84	7.13	6.38	9.31	9.65	8.56

Note. Intru. Ru= Intrusive Rumination; Deli. Ru= Deliberate Rumination; PTG= Posttraumatic Growth; PTS= Posttraumatic Stress

* $p < .05$, ** $p < .01$

Table 61 shows the bivariate correlation between the study variables at three time points. Psychological distress in T1 is positively associated with psychological distress T2 and psychological distress T3. Moreover, psychological distress is positively associated with PTS T1 and T3. Distress T1 is positively associated with intrusive rumination T1 and intrusive rumination T2. Distress is positively associated with deliberate rumination T1 and significantly negatively associated with the PTG T1. Distress T2 is positively associated with the PTS T1.

Distress T2 is positively associated with the intrusive rumination T1 and intrusive rumination T2. Distress T2 is positively associated with deliberate rumination T1 and T2. Distress T3 is positively associated with PTS T1, PTS T2 and PTS T3. Likewise, Distress T3 is positively associated with intrusive rumination T1, Intrusive rumination T2, Intrusive rumination T3 and deliberate rumination T3. Intrusive rumination T1 is positively associated with intrusive rumination T3. PTG T1 is positively associated with PTG T2 and PTG T3. PTG T2 is positively associated with PTG T3. In addition, to see the relationship between coping strategies and PTG, Table 62 shows the correlation between the PTG T1, T2 and T3 with coping styles. PTG T1 is positively associated with self-distraction, use instrumental support, active coping, planning, positive reframing, religious coping, acceptance coping, PTG T2 and PTG T3 and negatively associated with substance abuse coping. Furthermore, PTG T2 is significantly negatively associated with emotional support and self-blame coping and positively associated with PTG T3. In addition, PTG T3 is positively associated with self-distraction, active coping, and Humour coping and negatively associated with substance abuse coping and self-blame coping. Results supported our seventh hypotheses.

Table 62

Relationship of Coping Strategies with Posttraumatic Growth T1, T2 and T3

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 S. distract		.36**	.20*	-.16	.31**	.15	.14	.35**	.28**	.18	.07	.27**	.33**	.34**	.19*	-.14	.19*
2 Active copi			-.02	-.17	.06	.24*	.03	.13	.56**	.41**	-.08	.24*	.38**	.02	.45**	.15	.24*
3 Denial				.01	.17	.02	.16	.29**	.05	.12	.14	-.03	.02	.13	.10	.06	.10
4 Substance					-.21*	-.12	.22*	-.01	-.18	-.32**	.30**	-.29**	-.50**	.27**	-.21*	-.18	-.23*
5 Use em. s						.30**	.23*	.46**	.14	-.03	.32**	.06	-.05	.40**	.05	-.23*	-.05
6 Use intrur.s							.09	.10	.27**	.43**	.09	.37**	.22*	.11	.32**	-.18	-.03
7 Beh. Dis.								-.26**	-.02	.01	.26**	.13	-.01	.26**	-.07	-.16	-.12
8 Venting									.08	.12	.19*	.18	.01	.34**	.04	-.18*	-.10
9 P. reframi										.45**	.03	.22*	.40**	.05	.39**	.12	.12
10 Planning											.10	.46**	.32**	.03	.55**	.15	.20*
11 Humour													-.30**	.29**	.08	-.14	-.03
12 Acceptance															.23*	.33**	.01
13 Religion																-.05	.29**
14 Self-blame																	.02
15 PTG T1																	
16 PTG T2																	
17 PTG T3																	

Note. S. Distract= Self-distraction; Active copi= Active coping; Substance= Substance use coping; Use em. s= Use emotional Support; Use intrur.s = Use instrumental Support; Beh. Dis.= Behavioural disengagement; P. Reframi= Positive reframing; PTG = Posttraumatic Growth.

Table 63*Posttraumatic Growth Inventory for Flood Affectees Item-Level Descriptive Statistics at Three Time Points*

	<i>Items</i>	Time 1 (<i>n</i> =327)		Time 2 (<i>n</i> =239)		Time 3 (<i>n</i> =153)		<i>Domains of PTG</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
1	"I changed my priorities about what is important in life"	2.11	1.42	1.67	1.35	1.93	1.55	Appreciation of life
2	"I have a greater appreciation for the value of my life"	3.22	1.46	2.81	1.42	3.31	1.43	Appreciation of life
3	"I am able to do better things with my life"	3.25	1.41	2.94	1.44	3.21	1.48	New possibilities
4	"I have a better understanding of spiritual matters"	3.37	1.33	3.12	1.49	3.46	1.46	Spiritual change
5	"I have a greater sense of closeness with others"	2.81	1.47	2.68	1.51	2.92	1.56	Relating to others
6	"I established a new path for my life"	2.40	1.67	2.40	1.59	2.58	1.57	New possibilities
7	"I know better that I can handle difficulties"	3.02	1.40	2.76	1.50	2.89	1.55	Personal strength
8	"I have a stronger religious faith"	4.10	1.27	3.65	1.53	3.76	1.51	Spiritual change
9	"I discovered that I'm stronger than I thought I was"	3.34	1.45	3.07	1.47	3.13	1.48	Personal strength
10	"I learned a great deal about how wonderful people are"	3.03	1.41	2.94	1.49	3.27	1.46	Relating to others

*Note.*PTG = Posttraumatic growth.

Table 63 illustrates the descriptive statistics about the mean differences in T1, T2 and T3 scores. Results shows that there is decline in appreciation in life, new possibilities, spiritual change, relating to others and personal strength from T1 to T2. Decline in mean scores are seen on all the five domains of PTG. whereas, the scores in T3 there is again uplift in all the domains of PTG. The reason could be that during 2013 before taking the data of T3, there was again the flood. These findings are consistent with PTG theory.

Table 64

Gender difference on Study Variables at 3rd Time point (N =153)

<i>Variables</i>	Men (<i>n</i> = 63)		Women (<i>n</i> = 90)		<i>t</i>	<i>p</i>	<i>LL</i>	<i>UL</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Psychological Distress	19.27	10.87	18.41	11.51	.46	.64	-2.81	4.54
Stress	7.82	4.14	7.26	4.16	.82	.41	-.79	1.91
Anxiety	6.08	4.47	5.63	4.42	.61	.54	-1.00	1.89
Depression	5.52	3.77	5.43	4.43	.14	.89	-1.27	1.46
PTS	31.53	17.19	34.26	15.35	1.02	.31	-8.03	2.56
Intrusive of PTS	15.31	8.73	16.84	8.21	1.10	.27	-4.30	1.22
Avoidance of PTS	16.36	9.75	17.42	8.54	.71	.48	-4.04	1.91
Intrusive rumination	15.20	7.37	15.50	6.16	.27	.79	-2.47	1.88
Deliberate rumination	16.79	7.20	16.67	5.78	.11	.91	-1.97	2.20
Psychological wellbeing	13.48	4.69	16.02	4.57	3.34	.01	-4.04	-1.04
Social support	51.75	16.45	55.72	16.27	1.48	.14	-9.29	1.34
Satisfaction with life	19.79	7.43	21.96	6.44	1.91	.06	-4.39	.07
Posttraumatic Growth	29.36	7.85	31.18	9.00	1.29	.20	-4.59	.96
PTG Relating to others	6.25	2.24	6.16	2.63	.24	.81	-.71	.90
PTG New possibilities	5.60	2.14	5.93	2.44	.86	.39	-1.08	.42
PTG Personal strength	5.76	2.51	6.21	2.86	1.00	.32	-1.33	.43
PTG Spiritual change	6.94	2.42	7.46	2.24	1.36	.18	-1.27	.23
PTG life appreciation	4.94	2.60	5.46	2.58	1.22	.22	-1.36	.32

Table 64 shows the gender differences on psychological distress, intrusive and avoidance symptoms of PTS, intrusive and deliberate rumination, psychological wellbeing, and perceived social support, life satisfaction, PTG and its subscale at

3rd time point. Results demonstrated that there is non significant difference between the study variables across gender at third time point. However, psychological wellbeing is higher among women as compared to men and the difference is significant.

Table 65

Comparison of Psychological Distress, PTS, Rumination Patterns, and PTG at 3rd Time Point (N=153)

Variables	Time 1		Time 2		Time 3		F	p
	M	SD	M	SD	M	SD		
Psychological Distress	16.76	10.82	16.02	10.72	17.22	10.63	.36	.70
Stress	7.05	3.80	6.43	3.76	7.05	4.11	.96	.38
Anxiety	4.06	4.01	4.45	3.93	5.12	4.02	2.05	.13
Depression	5.59	4.16	5.15	4.02	4.97	3.85	.71	.49
PTS	36.24	17.39	33.26	18.51	32.09	16.69	1.68	.19
Intrusive rumination	14.72	7.60	13.18	8.27	14.94	6.86	1.82	.16
Deliberate rumination	17.76	6.81	14.58	7.33	17.10	6.61	3.96	.02
Posttraumatic Growth	30.38	9.66	27.68	10.08	31.23	8.37	4.45	.01
PTG Relating to Others	5.84	2.50	5.64	2.58	6.42	2.16	3.18	.04
PTG New possibilities	5.46	2.62	5.26	2.58	6.00	2.24	2.71	.07
PTG Personal Strength	6.29	2.59	5.75	2.55	6.12	2.59	1.29	.28
PTG Spiritual Change	7.54	2.25	6.73	2.85	7.40	2.34	3.47	.03
PTG Life Appreciation	4.39	2.39	5.25	2.43	5.37	2.51	5.45	.01

Note. * $p < .05$, ** $p < .01$, $df = (2, 150)$

Table 65 shows the difference of psychological difference, PTS, intrusive and avoidant symptoms and posttraumatic growth across three time points. Results demonstrated that there is significant difference on deliberate rumination and on PTG at three time points. Moreover, significant differences are also seen in the domains of PTG at three time points, such as relating to others, change in spirituality, and life appreciation. For detail description of the differences across the variables, we performed the Posthoc analysis in Table 66.

Table 66

Post Hoc Analysis for the differences of Rumination patterns and PTG across Three Time Points (N=153)

Variables	(I) Categories Time	(J) Categories Time	Mean Difference (I-J)	(i-j)	S.E	LL	UL
Deliberate rumination	Time 1	Time 2	Time 1 > Time 2	3.18*	1.14	.43	5.94
Posttraumatic Growth	Time 2	Time 3	Time 2 < Time 3	- 3.55*	1.24	- 6.54	-.56
Relating to Others	Time 2	Time 3	Time 2 < Time 3	-.78*	.32	- 1.55	-.01
Spiritual Change	Time 1	Time 2	Time 1 > Time 2	.81*	.33	.02	1.61
Life appreciation	Time 1	Time 2	Time 1 < Time 2	-.86*	.32	- 1.64	-.08
		Time 3	Time 1 < Time 3	- .98**	.32	- 1.75	.20

In Table 66, Analysis of variance showed a statistically significant difference at the $p < .05$ level in Deliberate rumination scores at three time points: $F(2, 149) = 3.96$. Post-hoc analysis using the Bonferroni test indicated that the mean score for T1 was significantly different from T2. In addition, statistically significant difference was found in PTG scores for three time points: $F = 4.45$. Post-hoc analysis illustrated that the mean score for T2 were significantly different from T3. Moreover, to see the differences in the subscales of PTG, it was found a statistically significant difference in subscale of Relating to others scores for the three groups: $F = 3.18$. Post-hoc analysis showed that the mean score for T2 were significantly different from T3 scores.

There is also statistically significant difference in subscale of Spiritual Change, domain of PTG scores for the three groups at three time points: $F = 3.47$. Post-hoc analysis using the Bonferroni test demonstrated that the mean score for T1 were significantly different from T2. Besides, there was statistically significant

difference on the variable of Life appreciation across three groups (three time points) $F= 5.45$. Post-hoc analysis showed that the mean score for T1 were significantly different from the mean scores from T 2 and T3. These findings are not consistent to our hypothesis. It was hypothesized that Flood Related intrusive and deliberate Rumination, PTS, psychological distress and PTG will more likely decline in T3 as in comparison to T1 and T2. Results are reported in Table 66 are quite contrary to our hypothesis. We see again rise in scores on the variable of Flood Related intrusive and deliberate Rumination, PTS, psychological distress and PTG. The possible reason could be that the same population again underwent the flood in 2013. That may become the cause of again the rise in distress, PTS and flood related ruminations. However, the results are consistent with the PTG theory that immediate after the disaster, there would be high distress, PTS, ruminations, and PTG.

Graphical Presentation of Trajectory of Studied Variables across three Time Points

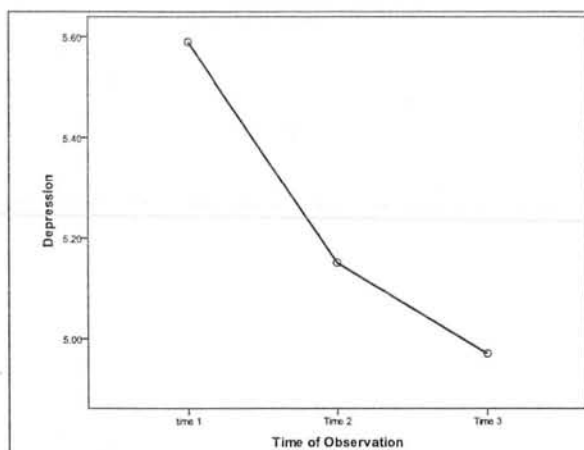


Figure 29. Comparison of PTS (intrusive symptoms) across three Time points.

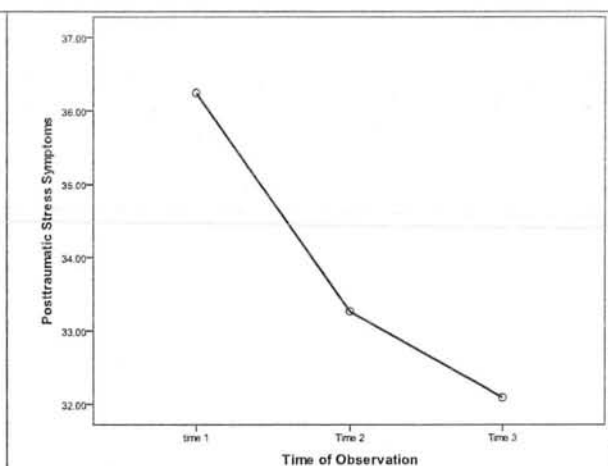


Figure 30. Comparison of PTS (Avoidance symptoms) across three Time points.

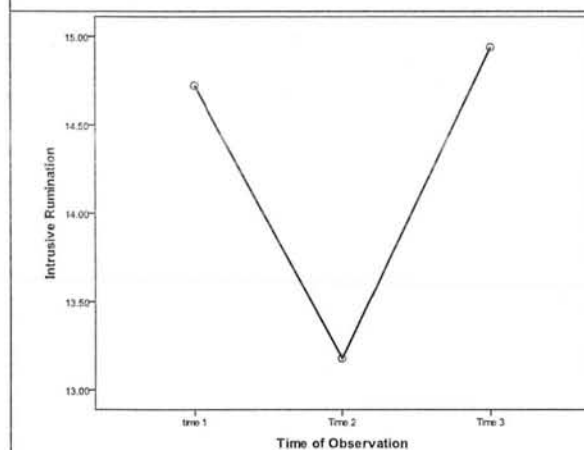


Figure 31. Comparison of intrusive rumination) across three Time points.

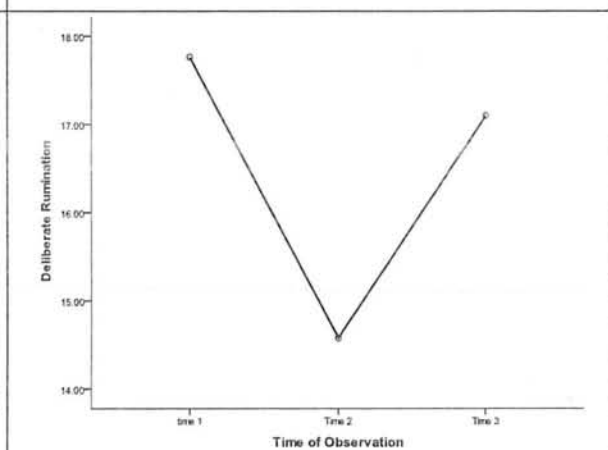


Figure 32. Comparison of deliberate rumination across three Time points.

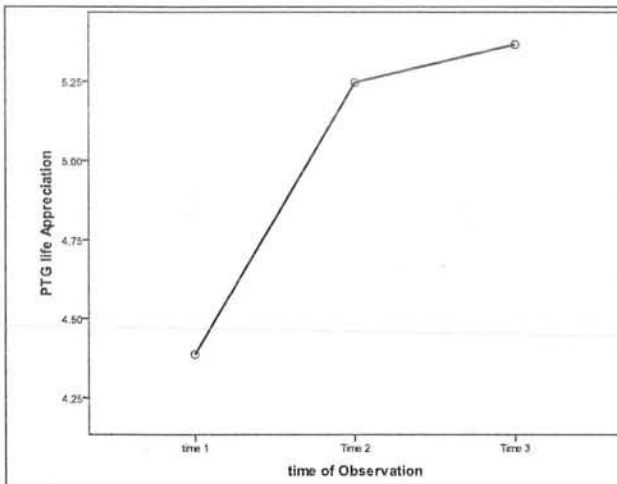


Figure 33. Comparison of life appreciation across three Time points.

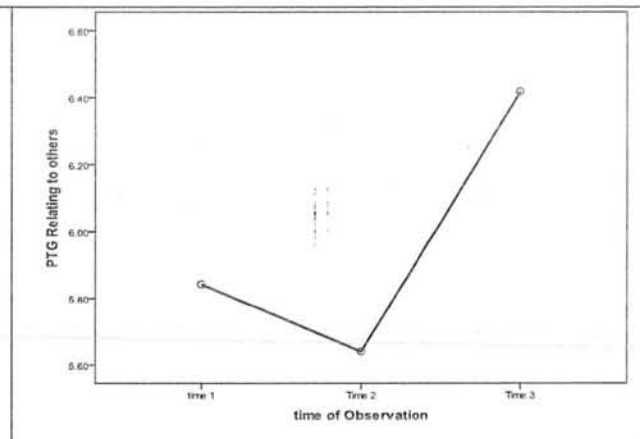


Figure 34. Comparison of relating to others across three Time points.

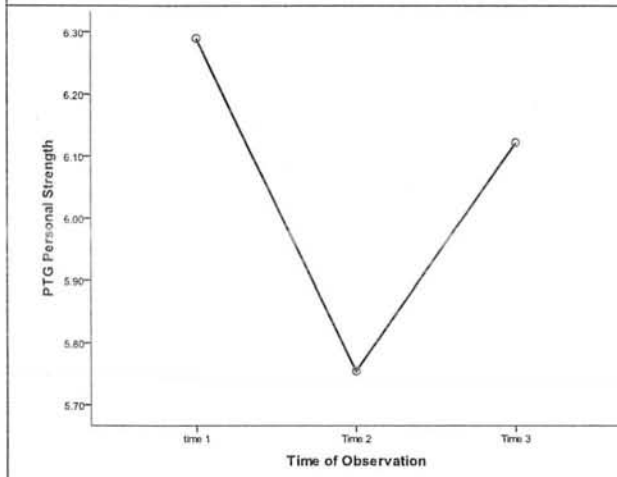


Figure 35. Comparison of personal strength across three Time points.

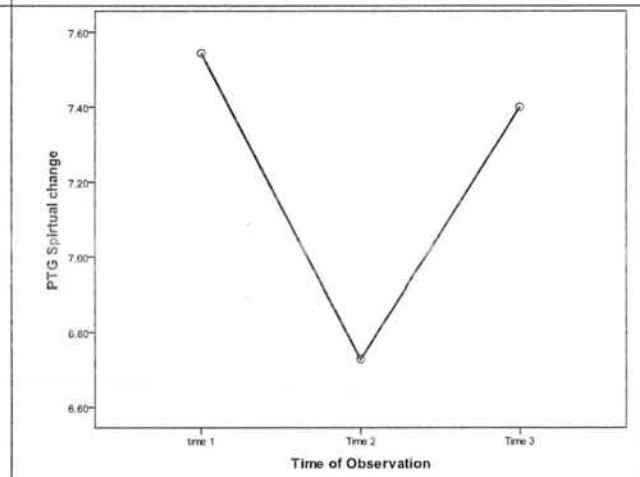


Figure 36. Comparison of spiritual change across three Time points.

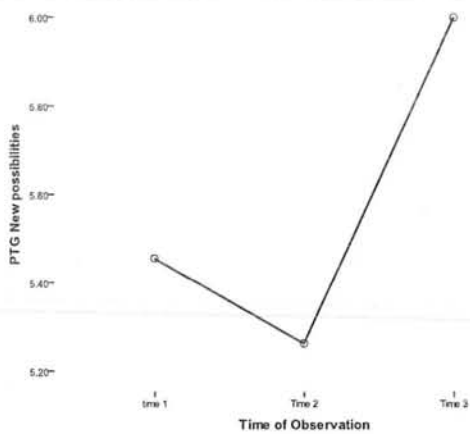


Figure 37. Comparison of new possibilities across three Time points

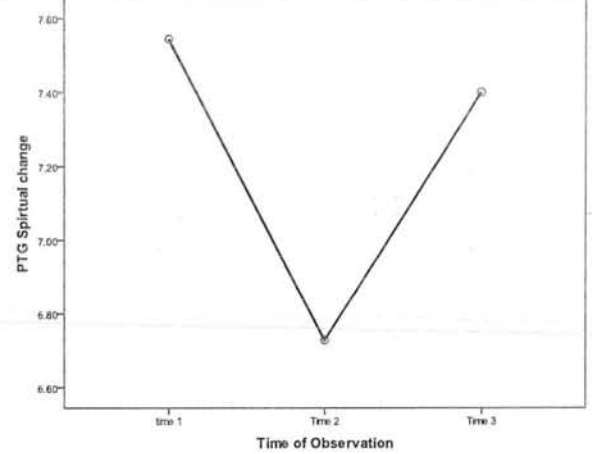


Figure 38. Comparison of PTG across three Time points

Table 67

Comparison of Coping Strategies across Three Time Points (N=153)

Variables	Time 1		Time 2		Time 3		F	p
	M	SD	M	SD	M	SD		
Self-Distraction	5.22	1.60	4.67	1.69	4.94	1.55	3.36	.04
Active Coping	6.39	1.47	5.88	1.68	6.15	1.51	3.06	.05
Denial	4.37	1.61	4.62	1.63	4.32	1.73	1.07	.34
Substance use	2.42	1.18	2.65	1.24	2.48	1.16	1.18	.31
Use Emotional Support	4.13	1.50	4.23	1.86	4.52	1.33	1.90	.15
Use Instrumental Support	5.61	1.56	5.25	1.55	5.44	1.45	1.60	.20
Venting	4.33	1.44	4.47	1.55	4.74	1.48	2.20	.11
Positive Reframing	5.88	1.56	5.45	1.73	5.44	1.48	2.80	.06
Planning	6.13	1.58	5.44	1.75	5.77	1.64	4.99	.01
Humour	3.53	1.43	3.59	1.45	3.75	1.54	.69	.50
Acceptance	5.65	1.62	5.43	1.52	5.50	1.55	.62	.54
Religion	7.24	1.38	6.81	1.55	6.61	1.70	4.91	.01
Self-Blame	3.96	1.72	3.95	1.66	4.04	1.61	.11	.90
Behavioural disengagement	4.15	1.57	3.80	1.61	4.17	1.76	1.85	.16

Table 68*Post Hoc Analysis of the Difference of Coping Strategies across Three Time Points*

Variables	(I)Categories Time	(J)Categories Time	Mean Difference (I-J)	(i-j)	S.E	LL	UL
Self Distraction	Time1	Time 2	Time 1 > Time 2	.55*	.21	0.04	1.06
Active Coping	Time 1	Time 2	Time 1 > Time 2	.51*	.21	0.01	1.00
Planning Coping	Time 1	Time 2	Time 1 > Time 2	.69**	.22	.16	1.22
Religious Coping	Time 1	Time 3	Time 1 > Time 3	.63**	.20	.13	1.12

Note. * $p < .05$, ** $p < .01$

Analysis of variance in Table 68 showed a significant difference at the $p < .05$ level in self-distraction coping scores for the groups at 3 time points: $F(2,149) = 3.36$, $p < .05$. Post-hoc analysis using the Bonferroni test demonstrated that the mean score for T1 was significantly different from T2. Moreover, statistically significant difference at the $p < .05$ level in active coping scores for the 3 time points: $F = 3.06$, $p < .05$. Post-hoc test showed that the mean score for T1 was significantly different from T2. There was also a statistically significant difference in planning coping scores for the three groups: $F = 4.99$. Post-hoc analysis indicated that the mean score for T1 was significantly different from T2. Furthermore, there is also statistically significant difference at the $p < .05$ level in religious coping scores for three groups at three time points: $F = 4.91$, $p < .01$. Post-hoc comparisons depicted that the mean score for T1 was significantly different from T3.

Graphical Presentation of Trajectory of Coping Strategies across three Time Points

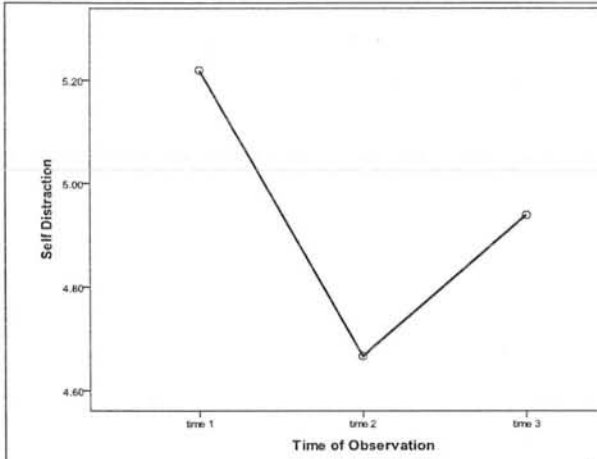


Figure 39. Trajectory of self-distraction coping at three Time points.

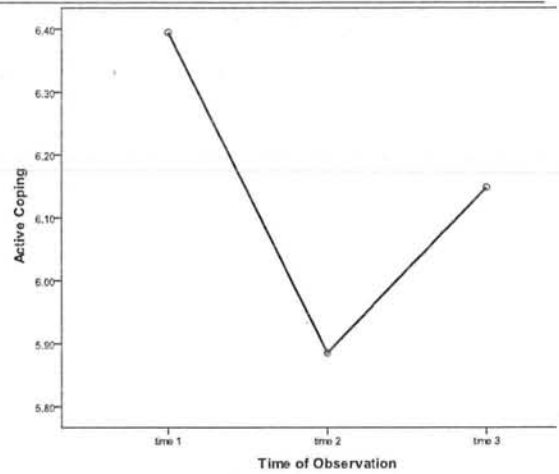


Figure 40. Trajectory of Active coping at three Time points.

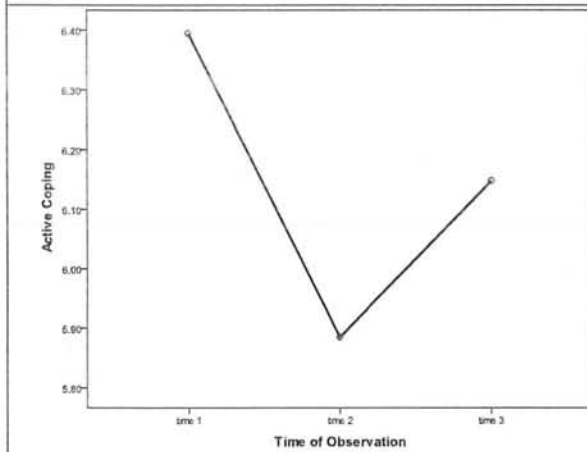


Figure 41. Trajectory of Denial across three Time points.

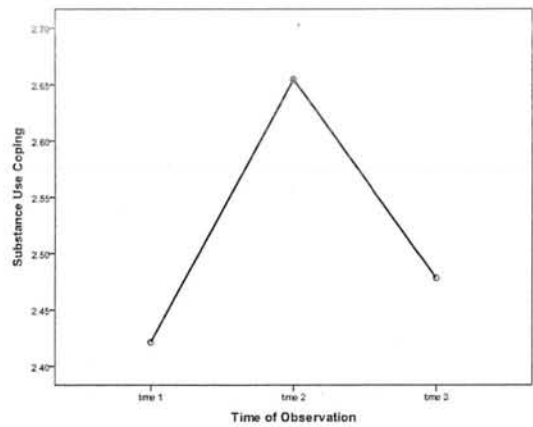


Figure 42. Trajectory of Substance use coping across three Time points.

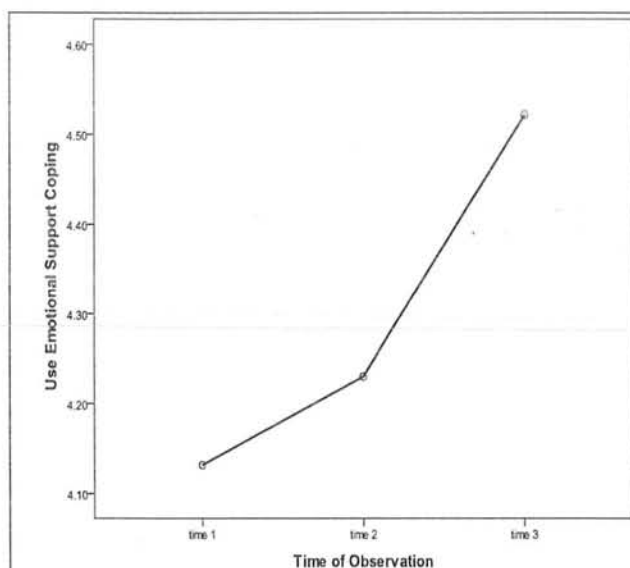


Figure 43. Trajectory of emotional support coping across Time.

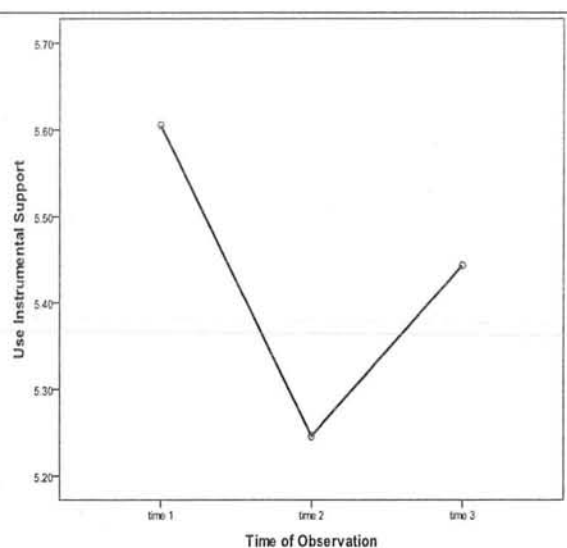


Figure 44. Trajectory of use instrumental support across Time.

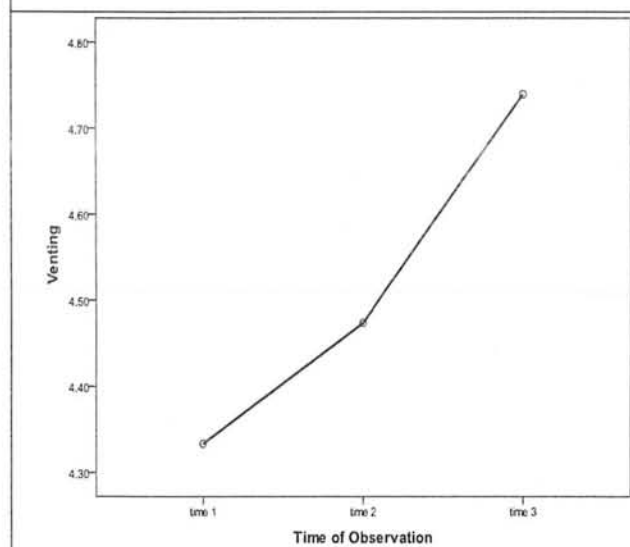


Figure 45. Trajectory of Venting Coping across Time.

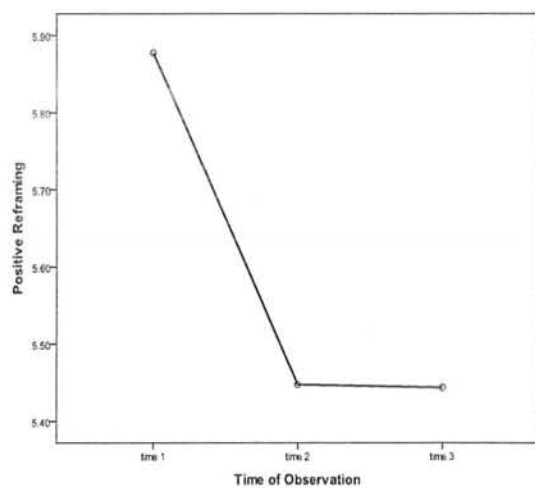


Figure 46. Trajectory of positive reframing across Time.

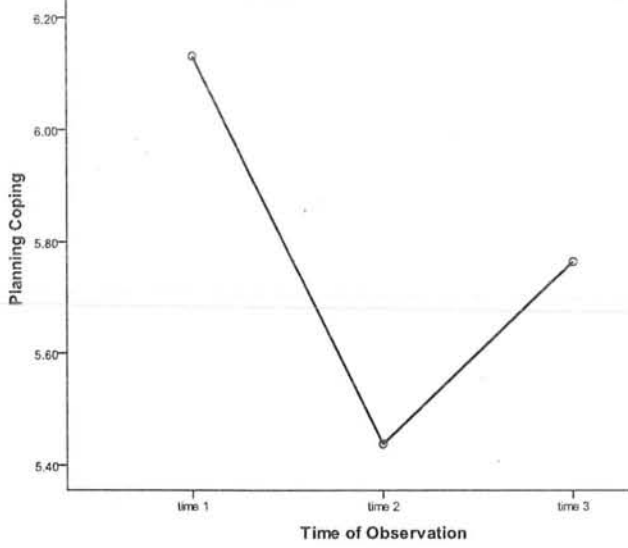


Figure 47. Trajectory of Planning coping across three Time.

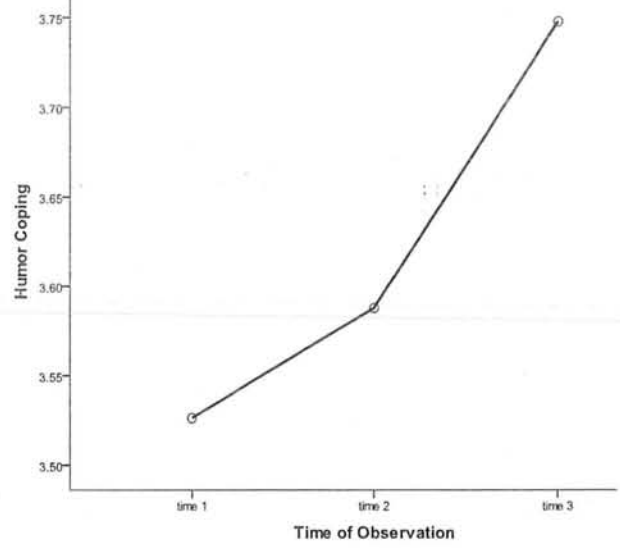


Figure 48. Trajectory of Humour coping across three Time points.

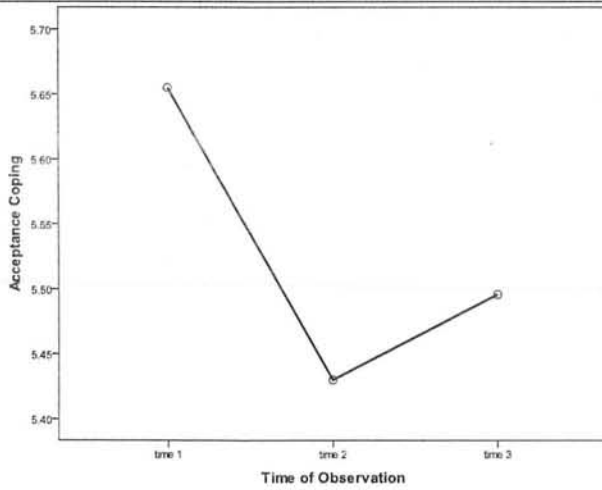


Figure 49. Trajectory of Acceptance coping across three Time points.

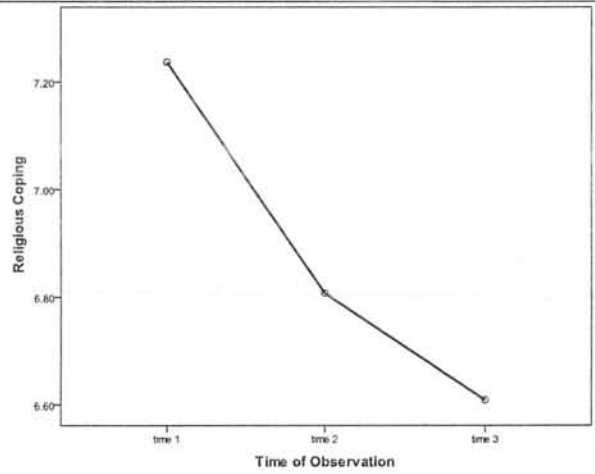


Figure 50. Trajectory of Religious coping across three Time points.

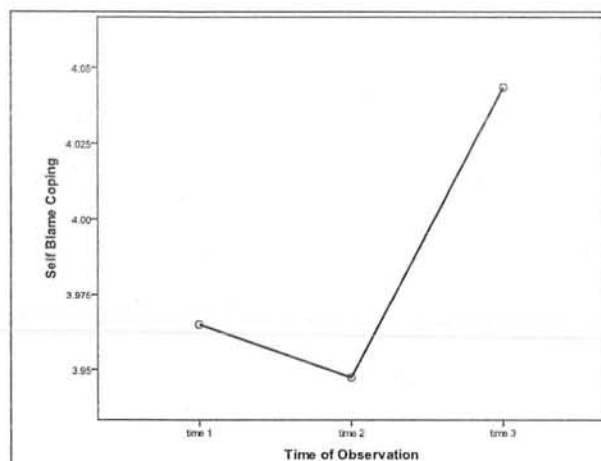


Figure 51. Trajectory of Self-Blame across three Time points.

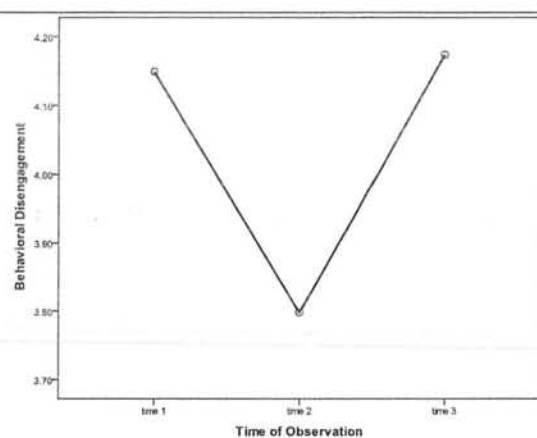


Figure 52. Trajectory of Behavioural Disengagement across three Times.

Figures 39 to 52 show the trajectory of PTS, Distress responses, rumination patterns, PTG, and coping strategies across three time points. Figures showed the distinct patterns of change in coping strategies across time. These patterns are discussed in Table 67 in detail. These patterns of change in coping strategies across three time points may be helpful future researchers for further investigation and understanding of the trajectory.

Model Testing

To explore the trajectory of distress responses, posttraumatic stress symptoms, rumination patterns, and posttraumatic growth over three time points model testing was done by using Amos 18. Below we are presenting the trajectory of anxiety, depression, stress, intrusive rumination, deliberate rumination, PTS and PTG in separate models. The first model demonstrates the trajectory of anxiety and PTG at three time points. Second and third model demonstrates the trajectory of depression and stress with PTG across three time points. Fourth and fifth model showed the changing patterns of intrusive and deliberate rumination patterns with PTG and in the final model trajectory of PTS and PTG are demonstrated in a single model.

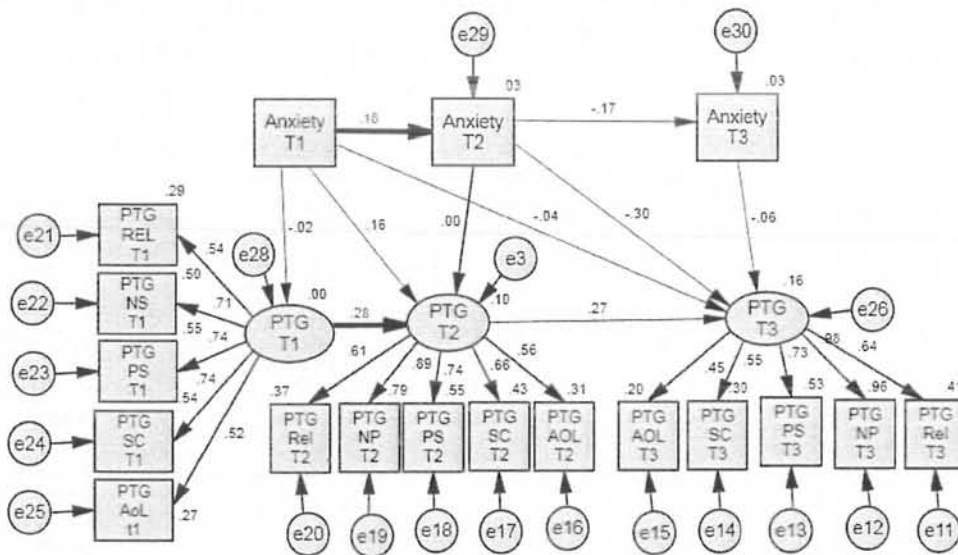


Figure 53. Cross sectional and longitudinal relationship of anxiety and PTG.

Figure 53 shows the cross sectional and longitudinal role of anxiety in predicting PTG. Boldface arrows shows the significant paths and un-bold arrows show non-significant paths. Cross sectional paths showed that anxiety T1, T2 and T3 did not significantly predict PTG. To see the longitudinal path across time, PTG T1

was the significant predictor of PTG T2 ($\beta = .28, p = .01$) and Anxiety T1 was significantly predicting the Anxiety T2 ($\beta = .18, p < .05$). Overall the model explained the 16 % of variance.

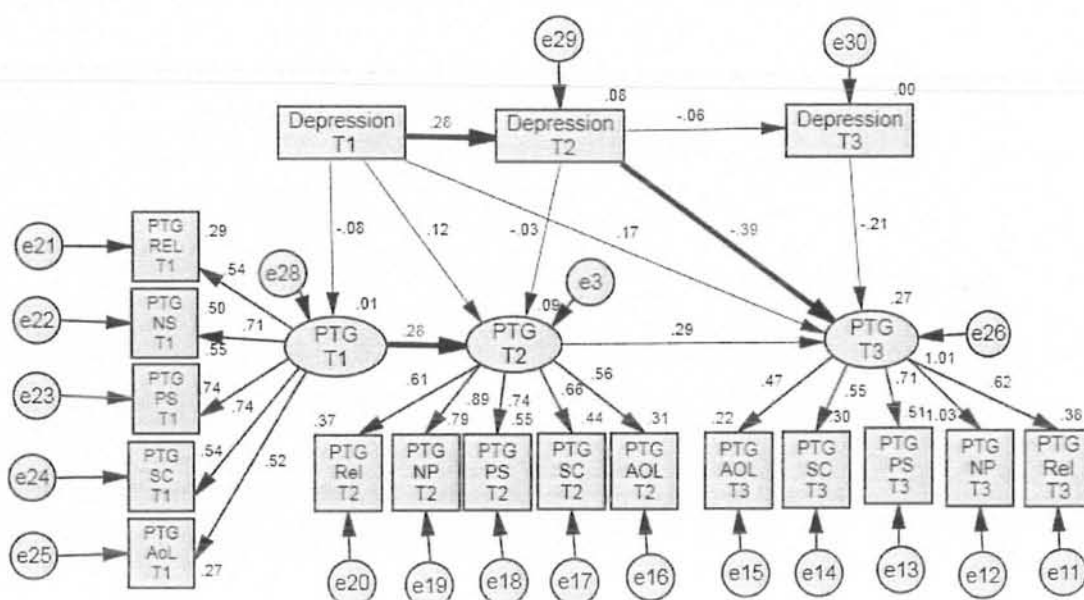


Figure 54. Cross sectional and longitudinal relationship of depression and PTG.

Figure 54, demonstrates the cross sectional and longitudinal role of depression in predicting PTG. Arrows in boldface shows the significant paths and un-bold arrows show non-significant paths. All the cross sectional paths showed non significant relationships. Moreover, predictors of PTG T1 explained 01 % variance. Predictors of PTG T2 explained 9 % of variance and the predictors of PTG T3 explained 27 % of variance. To see the longitudinal path across time, PTG T1 was the significant predictor of PTG T2 ($\beta = .28, p < .001$) and the Depression T1 was the significant predictor of Depression T2 ($\beta = .28, p < .001$). Moreover, depression T2 negatively

predicted the PTG T3 ($\beta = -.39, p < .001$). All the other longitudinal paths were not significant. So the model explained 27 % variance.

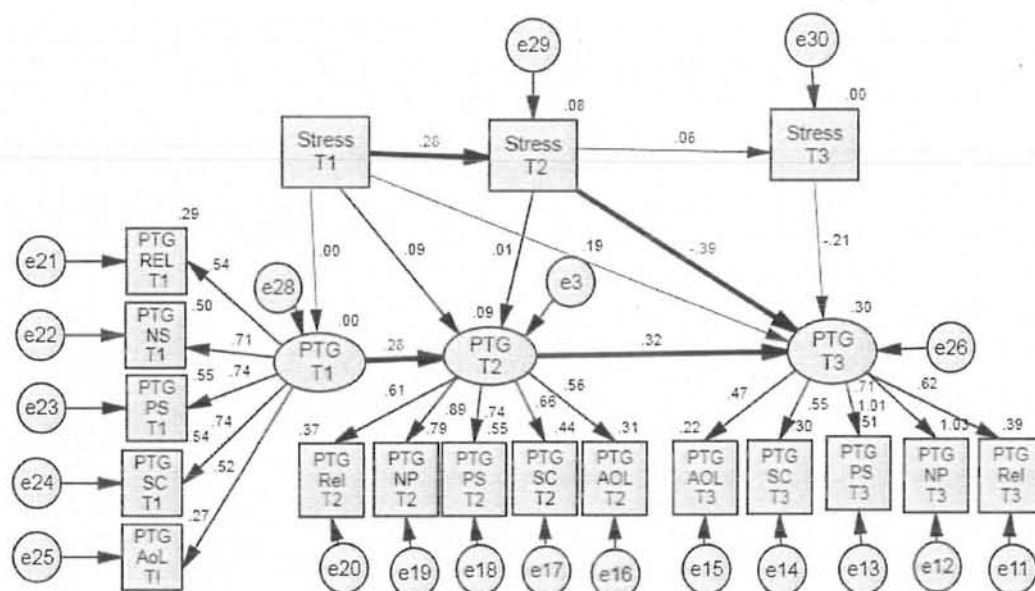


Figure 55. Cross sectional and longitudinal relationship of stress and PTG.

Figure 55 shows the cross sectional and longitudinal role of stress in predicting PTG. Boldface arrows shows the significant paths and un-bold arrows show non-significant paths. Cross sectional paths showed the non-significant results. To see the longitudinal path across time, PTG T1 was the significant predictor of PTG T2 ($\beta = .28, p = .001$). In addition, stress T1 was the significant predictor of Stress T2. In the longitudinal path, stress T2 negatively affected the PTG T3. Predictors of PTG T2 explained 09 % of variance and the overall model explained the .30 % of variance.

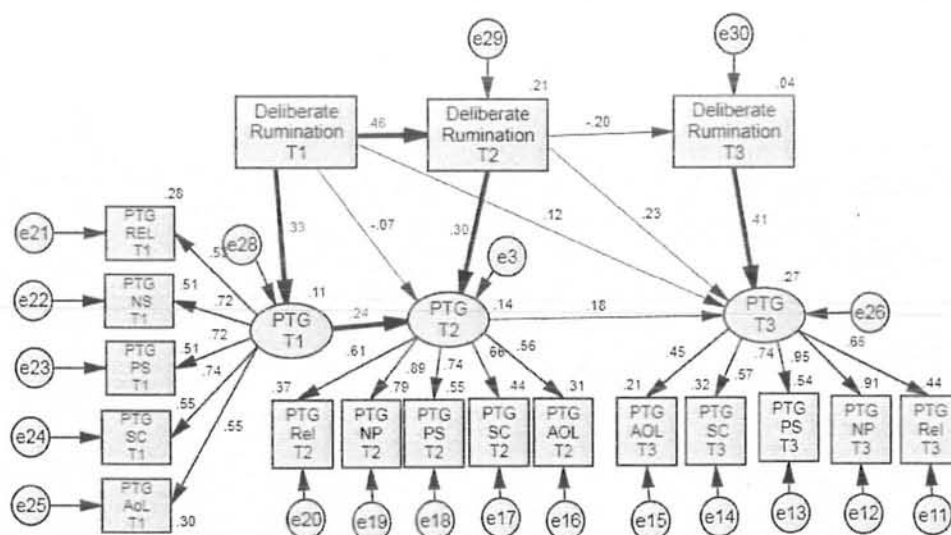


Figure 56. Cross sectional and longitudinal relationship of deliberate rumination and PTG.

To see the cross sectional and longitudinal paths of deliberate rumination and PTG, arrows in boldface shows the significant paths and un-bold arrows show non-significant paths. Cross sectional paths showed that deliberate rumination T1 predicts PTG T1 ($\beta = .33, p < .01$). In addition, deliberate rumination T2 predicts PTG T2 ($\beta = .30, p < .01$) and deliberate rumination T3 predicts PTG T3 ($\beta = .41, p < .01$). Moreover, predictors of PTG T1 explained 11 % variance. Predictors of PTG T2 explained 14 % of variance and the predictors of PTG T3 explained 27 % of variance. To see the longitudinal path across time, PTG T1 was the significant predictor of PTG T2 ($\beta = .24, p = .001$). Moreover, deliberate rumination T1 is the significant predictor of the deliberate rumination T2 ($\beta = .46, p < .001$). It supports our eighth hypothesis.

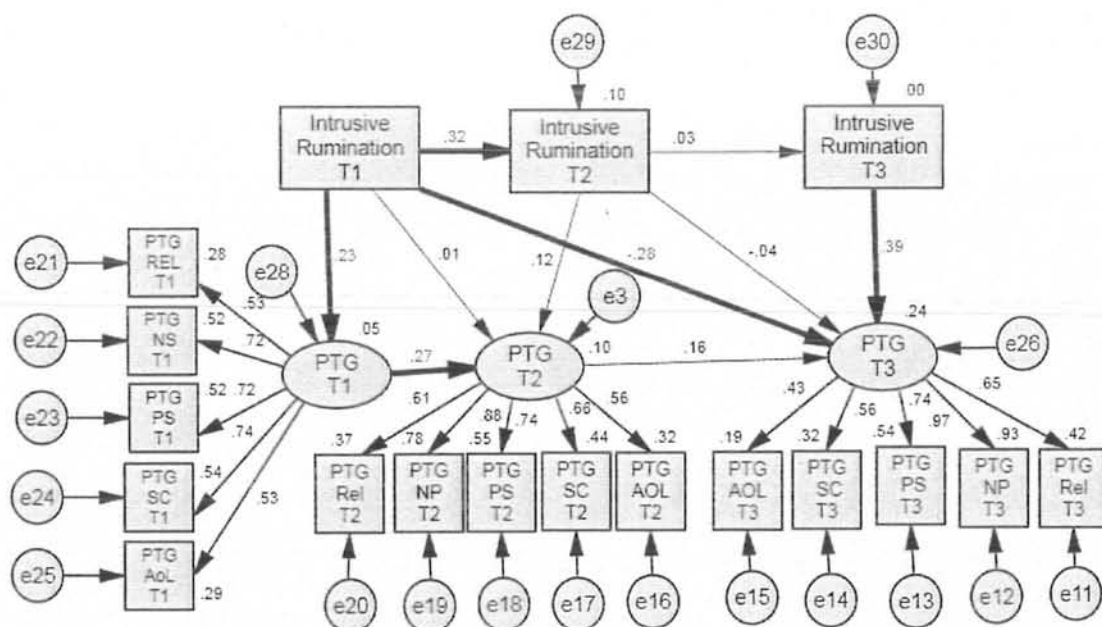


Figure 57. Cross sectional and longitudinal relationship of intrusive rumination and PTG.

To see the cross sectional and longitudinal paths between intrusive rumination and PTG, arrows in boldface shows the significant paths and unbolded arrows show non-significant paths. Cross sectional paths showed that intrusive rumination T1 predicts PTG T1 ($\beta = .23, p < .01$). In addition, intrusive rumination T2 predicts PTG T2 ($\beta = .12, p = n.s$) and Intrusive rumination T3 predicts PTG T3 ($\beta = .39, p < .01$). Moreover, predictors of PTG T1 explained 05 % variance. Predictors of PTG T2 explained 10 % of variance and the predictors of PTG T3 explained 24 % of variance. To see the longitudinal path across time, PTG T1 was the significant predictor of PTG T2 ($\beta = .32, p = .001$) and intrusive rumination T1 was the significant predictor of intrusive rumination T2 ($\beta = .35, p < .01$). Besides, intrusive rumination T1 predicted PTG T3 ($\beta = .28, p < .01$). It's partially supported our eighth hypothesis. However, all the other longitudinal paths were not significant.

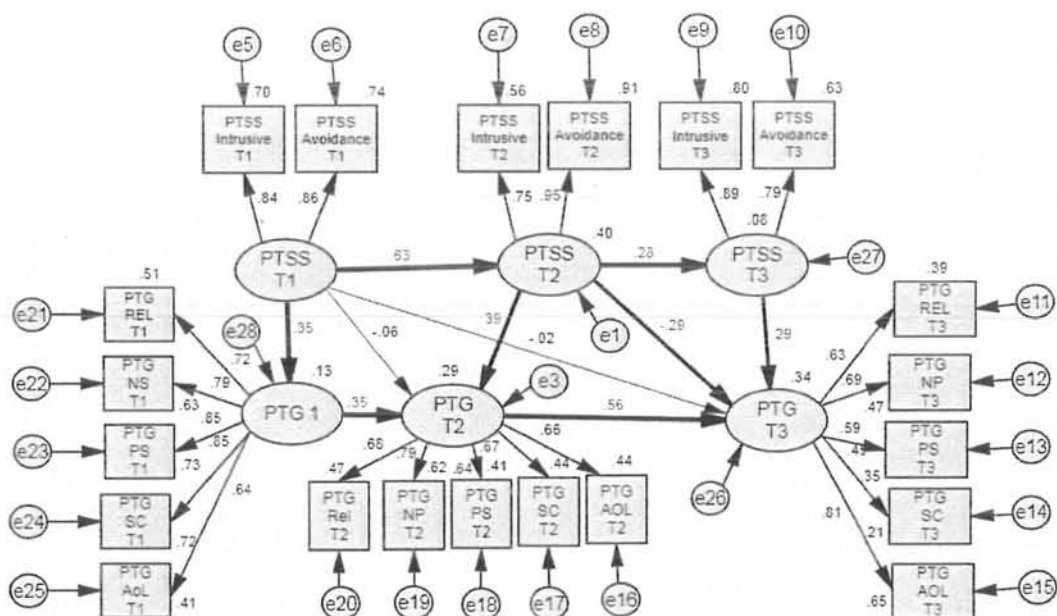


Figure 58. Cross sectional and longitudinal relationship of PTS and PTG.

To see the trajectory of PTS and PTG, both the cross sectional path and longitudinal paths were analysed. Arrows in boldface show the significant paths. Whereas, un-bold arrows show non-significant paths, cross sectional paths shows that PTS T1 predicted PTG T1 ($\beta = .35, p < .01$). In addition, PTS T2 predicted PTG T2 ($\beta = .39, p < .01$) and PTS T3 predicted PTG T3 ($\beta = .29, p < .01$). Moreover, predictors of PTG T1 explained 13 % variance. Predictors of PTG T2 explained 29 % of variance and the predictors of PTG T3 explained 34 % of variance. Predictors of PTS T2 explained 33 % of variance, and predictors of PTS T3 explained the .04 % of variance. To see the longitudinal path across time, PTS T1 significantly predicted PTS T2 ($\beta = .63, p < .01$) and PTS T2 significantly predicted PTS T3 ($\beta = .28, p < .01$). Similarly, PTG T1 significantly predicted PTG T2 ($\beta = .35, p < .01$) and PTG T2 significantly predicted PTG T3 ($\beta = .56, p < .01$). However, there are non significant paths between PTS T1 and PTG T2. Moreover, PTS T1 did not significantly predicted the PTG T3 ($\beta = .03, p = ns$). However, PTS T2 significantly negatively predicted the PTG T3 ($\beta = -.29, p = .05$).

In other words, results in the model demonstrated that when PTS T1 goes up by 1 standard deviation, PTS T2 goes up by .63 standard deviation. Similarly, when PTS T2 goes up by 1 standard deviation, PTS T3 goes up by .28 *SD*. To see the trajectory of PTG we found the when PTG T1 goes up by 1 standard deviation, the PTG T2 goes up by .35 standard deviation and when PTG T2 goes up by 1 standard deviation, PTG T3 goes up by .56 Standard deviations. All the betas are significant. Furthermore, to see the effects of PTS T1 and PTS T2 on PTG T2 and PTG T3, results showed that when PTS T1 goes up by 1 standard deviation, PTG T2 goes down by -.06 standard deviation and when PTS T1 goes up by 1 standard deviation, PTG T3 goes down by -.02 standard deviation. However, these results were non-significant. While, we found that when PTS T2 goes up by 1 standard deviation, PTG goes down by -.29 standard deviation and the results are significant. PTS T1 explained 40 % of variance in PTS T2, while predictors of PTS T3 explained 8 % variance in PTS T3. Moreover, predictors of PTG T1 explained 13 % of variance, predictors of PTG T2 explained 29 % and predictors of PTG T3 explained 34 % of variance.

Table 69

Indices of Model Testing (N=153)

Model Number	χ^2 (df)	IFI	TLI	CFI	RMSEA	CMIN/df	p
Model 1 (Anxiety and PTG)	204.19 (128)	.93	.90	.93	.05	1.59	.001
Model 2 (Depression and PTG)	210.56 (128)	.93	.90	.92	.05	1.64	.001
Model 3 (Stress and PTG)	197.68 (128)	.93	.91	.93	.05	1.54	.001
Model 4 (Deliberate Rumination and PTG)	204.43 (128)	.93	.91	.93	.05	1.59	.007
Model 5 (Intrusive Rumination and PTG)	222.84 (128)	.92	.88	.91	.06	1.74	.001
Model 6 (PTS and PTG)	654.48 (360)	.91	.88	.90	.04	1.82	.007

DISCUSSION

The aim of the T3 of the study was to explore the temporal course and trajectory of PTS, distress responses, rumination patterns, coping styles, and PTG over three time points (i.e., T1, T2 and T3). Moreover, the study had undertaken to extend the previous literature from a longitudinal perspective, and further examine the possible longitudinal correlates PTS and PTG in a long-time frame after flood 2010 in Pakistan. For this, sample of 153 (Men= 63, 41%, Women= 90, 59%) individuals were available for the participation at T3. Before the data collection of T3 in mid of August 2013 another flood, however, with less intensity, again hit this area (Village Mandakhel, Mianwali) and the same population had undergone the flood again. Hence, this population was affected twice in the flood (i.e., before the data collection of T1 and T3). Moreover, 86 (35.98%) individuals who had been available at T2 could not be approached at T3. The attrition rate of the men was higher as compared to women. The possible reason of high attrition of the men could be that men generally go for work and move to other areas for the economic concerns while the women are typically available at home. That's why women attrition rate was lower as compared to men. After computing the psychometrics of the scales and assumption testing for the parametric statistics, we performed the correlation analysis among the T3 variables.

Relationship between T3 study variables

Correlation analysis among the study variables at T3 showed almost the same pattern of relationship as it was in the T1 and T2 of the study. Results of the correlation analysis are inline with the T1 and T2 of the same study and as well as the

findings of the past research (Gangstad et al., 2009; Helgeson et al., 2006; Kilmer, 2006; Park et al., 2008; Sawyer et al., 2012; Tedeschi & Calhoun, 2004). Furthermore to see the relationship between the study variables across three time points, we found that PTS T1 was positively associated with PTS T2 and PTS T3. PTG T1 was positively associated with PTG T2 and PTG T3. Intrusive and deliberate rumination T2 were significantly positively associated with the PTS and PTG T3 (for detail See Table 61). Findings are consistent with our assumptions and broader literature (Shakespeare-Finch & Lurie-Beck, 2014; Yonemoto et al., 2012; Yu et al., 2010; Zoellner & Maercker, 2006). In addition, the above mentioned findings are partially inline with the longitudinal study, in which it was found that higher T2 and T3 intrusive and avoidance symptoms were significantly related with higher PTG T3 and participants with greater number of hurricane-related stressors had reported significantly greater PTS T3 and PTG (Lowe, Manove, & Rhodes, 2013). Findings are congruent with that study in which data was taken after 1, 5, and 27 years and found strong positive associations between PTG and current level of PTS (Holgersen, Boe, & Holen, 2010).

Gender Differences on study variables across Three Time Points

To see the gender differences on psychological distress, intrusive and avoidance symptoms of PTS, intrusive and deliberate rumination, psychological wellbeing, perceived social support, life satisfaction, PTG and its subscale at T3, results showed no significant difference between the study variables across gender at T3. However, psychological wellbeing was significantly higher among women as compared to men (Table 65). From these findings it is inferred that the gender

differences in distress responses, rumination patterns and PTG levelled with the passage of time. Initially, it is however, well established that females showed high distress, PTS, ruminations and PTG, but with the passage of time the difference minimized. These results are in congruence with past literature (Broderick & Korteland, 2002; Butler & Nolen-Hoeksema, 1994; Davis & Macdonald, 2004; Garnefski et al., 2004; Jose & Brown, 2008). For example, PTG theorist, R.G. Tedeschi, (personal communication, February 5, 2013) reported that there is an increase in stress and growth early on and levelling off (to reach a level and become stable and unchanging) within 12-24 months. In addition, Danhauer et al. (2013) also reported that PTG is relatively stable over the first 6 months after a traumatic incident; changing pattern over time dependent upon one's core beliefs. Pollard & Kennedy (2007) showed that two-third of the survivors demonstrated no symptoms of depression after 10 years.

To see the descriptive item level analysis about the mean differences in T1, T2 and T3 at scores on PTG. Results showed a decline in appreciation in life, change in spirituality, relating others, identifying new possibilities, and sense of personal strength from T1 to T2. Decline in mean scores were seen on all the five domains of PTG. However, quite contrary to our hypothetical assumptions, at T3 there was again up rise in all the domains of PTG (Table 65). The reason could be the 2013 flood might have triggered the flood related ruminations again and subsequent PTG and the same pattern have been revised. Previous literature proposed that some demographic characteristics and socio-environmental conditions were found to affect the survivors' PTG (Bates et al., 2004; Moore et al., 2011; Turner de & Cox, 2004). However, these findings are consistent with PTG theory.

Comparing the Study Variables at Three Time Points

When main variables across T1 and T3 were compared, paired samples t -test demonstrated a significant increase in Anxiety scores from T1 to T3. PTS scores at T3 decline as compare to scores at T1. In addition, distress, stress, intrusive, deliberate rumination, social support, and life satisfaction remained unchanged across T1 and T3. The reason of the high anxiety at T3 could be that at flood affected areas there are constant threats and rumours regarding the future potential floods. So the fear regarding future, apprehensive thoughts and feeling of uncertainty are the typical symptoms of anxiety. Hence, because of these reasons, the anxiety might have increased in T3. Our results are consistent with those studies that showed increase in anxiety because of the constant future uncertainties. In addition, our findings related to the decline in PTS symptomatology decreases across time is in line with previous empirical literature (Pollard & Kennedy, 2007; Van Griensven et al., 2006). However, further future studies should see the effect of anxiety on PTG, more specifically, when the survivors are more anxious than in the other phases of the disaster (Silva et al., 2012).

To see the changes in PTG over time, we found a significant increase in PTG 'relating to others' scores from T1 to T3. On average PTG 'relating to others' was about .59 points higher in T3. Whereas, domains of PTG such as new possibilities, spiritual change, life appreciation, and personal strength remained unchanged with T1 and T3. Our results at T3 showed that there is significant increment in distress responses, PTS and PTG as compared to T2. However, the scores on PTS, distress, and PTG at T3 were comparably the same as in T1 data. Coping strategies such as, use emotional support, venting, were significantly increased in T3 as compared to T1.

Moreover, there is a significant dissipation in the coping strategies such as “positive reframing”, and “religious coping” in T3. Other coping strategies remained unchanged across T1 and T3. Our results are aligned with those studies that report that coping strategies remained relatively stable over time (Pollard & Kennedy, 2007). Future studies should see the effect of coping in relationship between PTS, psychological adjustment and PTG to disaster trajectory.

The possible reason of the heterogeneous findings could be that, after the flood 27th July, 2010, after experiencing the trauma, we saw the PTS, distress, intrusive rumination and growth was higher but with the passage of time there is decline on these variables in T2. However, prior to the data collection of the T3 as the same population had experienced the disaster again, so instead the further decline in both PTS and PTG, we came across the atypical pattern, otherwise the expected trajectory would be same that have been observed in T2. There is also a statistically significant increase in intrusive rumination scores at T3 as compared to scores at T2. That may be because of the flood 2013. Moreover, a statistically significant increase in PTG scores at T3 as compared to scores at T2. Therefore, stress, anxiety, depression, deliberate rumination, social support, and life satisfaction remained unchanged across T2 and T3. In a study, women patients and their partners completed surveys assessing PTG, cognitive and emotional processing at 3 time points spaced 9 months apart and the patients’ PTG was predicted by contemplating reasons of the disease at T1 (Manne et al., 2004).

Trajectory of Study Variables across Time

To explore the trajectory of distress responses, PTS, rumination patterns, and PTG over three time points. Model testing was done by using Amos 18. Trajectory of depression, anxiety, stress, intrusive, deliberate rumination, PTS, and PTG was seen in separate cross sectional and longitudinal models. Cross sectional paths showed that anxiety T1, T2 and T3 did not significantly predicted PTG. To see the longitudinal path across time, PTG T1 was the significant predictor of PTG T2 and Anxiety T1 was significantly predicted the Anxiety T2. Overall the model explained the 16 % of variance. To see the cross sectional and longitudinal role of depression in predicting PTG, all the cross sectional paths showed non-significant relationships. However, depression T2 negatively predicted the PTG T3. To see the longitudinal path of stress across time, stress T1 was the significant predictor of stress T2. In the longitudinal path, stress T2 negatively predicted the PTG T3 and the overall model explained the .30 % of variance.

To see the cross sectional and longitudinal paths of deliberate rumination and PTG, cross sectional paths showed that deliberate rumination T1 predicted PTG T1. In addition, deliberate rumination T2 predicted PTG T 2 and deliberate rumination T3 predicted PTG T3. Moreover, predictors of PTG T1 explained 11 % variance. Predictors of PTG T2 explained 14 % of variance and the predictors of PTG T3 explained 27 % of variance. These findings are consistent with the past research. For instance, Cann et al. (2011) and Dekel et al. (2011) found that the only significant longitudinal predictor of PTG is the deliberate rumination. In addition, deliberate rumination T1 was the significant predictor of the deliberate rumination T2. Similarly, while seeing the cross sectional and longitudinal paths between intrusive

rumination and PTG, cross sectional paths showed that intrusive rumination T1 predicted PTG T1. Intrusive rumination T2 predicted PTG T2 and intrusive rumination T3 predicted PTG T3. However, predictors of PTG T1 explained 05 % variance. Predictors of PTG T2 explained 10 % of variance and the predictors of PTG T3 explained 24 % of variance. To see the longitudinal paths across time, intrusive rumination T1 was the significant predictor of intrusive rumination T2 and intrusive rumination T1 predicted PTG T3. Finally, to see the trajectory of PTS and PTG, both the cross sectional path and longitudinal paths were analysed. Cross sectional paths shows that PTS T1 predicted PTG T1. PTS T2 predicted PTG T2 and PTS T3 predicted PTG T3. Moreover, predictors of PTG T1 explained 13 % variance. Predictors of PTG T2 explained 29 % of variance and the predictors of PTG T3 explained 34 % of variance. Predictors of PTS T2 explained 33 % of variance, and predictors of PTS T3 explained the .04 % of variance. To see the longitudinal path across time, PTS T1 significantly predicted PTS T2 and PTS T2 significantly predicted PTS T3. Similarly, PTG T1 significantly predicted PTG T2 and PTG T2 significantly predicted PTG T3. However, there were non-significant paths between PTS T1 and PTG T2. Almost similar findings are presented by the past research. For instance, Hafstad et al. (2011) and Kilmer & Gil-Rivas (2010) showed that PTS predicted PTG with time but not the other way round. In another study, ruminative thinking style predicted growth at 6 months as well as the rumination predicted anxiety and depressive symptoms over the period of time (Hilt et al., 2010; Wang, Chang, Chen, Chen, & Hsu, 2014). Kilmer et al. (2009) found that PTG T1 was the only noteworthy predictor of T2 PTG.

Additional research ought to examine whether other trauma samples display the similar trajectories and whether various trajectories show any differential PTS - PTG relationship. Moreover, future studies should see how PTS predicts PTG in other trauma populations and over time-points. As, the longer-term trajectory of PTG remains unknown, so along with psychosocial correlates, the analyses would add in understanding the different domains of PTG by providing evidence of PTG trajectories at subgroups levels in response to disaster. Moreover, there may be the possibility that personality factors might mediate or moderate some of the hypothesized interrelationships. So the future studies might consider the role of personality factors in the relationship between the trauma exposure and growth.

Limitations

There are several limitations inherent in longitudinal designs including the high attrition rate of the sample. In the current study, at T1 the data of 327 individuals were available from District Mianwali, 239 at T2, and at the T3 the sample reduced to 153 participants. Hence, the sample size of the T3 is quite small, mostly comprised female flood affected survivors thus has limited diversity. In addition, the results of the current study are only about those individuals who continued living in the flood affected area and data of those who moved out of the area for any reason after the flood were not available. It is additionally conceivable that comparatively more affected survivors were still in shelters. Hence, the present study might undermine impacts of the flood. Another major limitation of present study is reliance on participants retrospective reporting and use of respondents who have self-selected for participation in this research. Retrospective studies have higher instances of recall bias and confounding variables than prospective studies. Moreover,

this was primarily a correlational study. However, the inferences drawn about the causality ought to be done with care. In addition, the influence of confounding variables cannot be ruled out. We have also lack of control our environmental and many socio-demographic variables. For instance, in the light of previous literature, it had been assumed that there would be decline in PTS, distress, PTG at T3, however, before the data collection at T3, the same population was undergone the flood in 2013. However, the intensity of the flood was not that much that had been seen in 2010. So the typical pattern that was assumed was changed and instead the further decline in the trauma and PTG, there we witnessed again uplift. The use of three assessment points is another limitation of the present study. It has been suggested that three assessment points may limit the complexity of the growth curve and that at least four assessment points are needed for an in depth exploration of longitudinal data (Orcutt, Erickson, & Wolfe, 2004). We could not assess whether the PTG occurred was because of the struggle with trauma or it happened because of maturation. Maturation has been described as the emergence of behavioral characteristics because of growth processes. It also relates to the interplay between genetics and socio-environmental influences and occurs throughout life. With the constant exposure to floods a person may develop the skills to cope with the calamity. It can be assumed that it may be because of maturation that is normative developmental process (Tedeschi & Calhoun, 2004). So, it can be potential confounding variables for the longitudinal studies. Future studies should consider the changes due to flood or due to maturation and control the effect of maturation. Despite these limitations, our results contribute to enhance the existing knowledge of growth following adversity in flood survivors.

Conclusion

In our study, in the first two time points, both PTG and PTS followed the same pattern (dissipated with time). However, before the data collection of T3, same population had undergone the flood again, and we found an up lift of PTS and PTG again. It is, however, concluded that PTS and PTG follow the same trend or trajectory. Some discrepancies in the findings are in part attributed to the core beliefs, personality characteristics, socio-cultural and environmental factors. These findings enhance our understanding of the variety of outcomes after a natural disaster and underscore the necessity of using prospective designs to see the variability of trauma response because there may be individual differences in change patterns. Given that traumatic and distress responses may be continued many years after a disaster resulting functional impairment and distress. However, findings positive change seems to protect individuals from the effects of a negative perception of the impact of adversity. It can be inferred that people living in disastrous situation may cope the consequences of adversity without developing any significant psychopathology. Therefore, our results provide an important initial step to better understand the patterns of PTS and PTG and how they develop and change over time in flood affected survivors.

GENERAL DISCUSSION

This longitudinal study sought to supplement the literature by understanding the trauma and growth in an integrative psychosocial frame work and identified the relationship between flood appraisal, distress responses, PTS, rumination patterns, perceived social support, coping mechanisms, wellbeing and PTG among flood affected individuals. In addition, the study has undertaken to comprehend the cross sectional and longitudinal correlates of PTG and PTS and the trajectory of PTS, distress responses, rumination patterns and PTG over three time points. Data of flood affected individuals were collected at three time points with the interval of six months. At T1 data of 2000 of individuals was taken from six flood affected regions of Pakistan. For the longitudinal data, one flood affected area, Mianwali was selected for the data of Second ($N = 239$) and Third ($N = 153$) time point of the study. Longitudinal study design was used to understand the trauma and growth responses across time span.

The studies that have measured the association between PTS and PTG with longitudinal designs are limited by because of minimal number of measurement points and the delay between stressful event and time of measurement. As most studies are cross sectional and include only one time point. Moreover, most had collected the data months or years after the stressful event and data may be biased by memory (Meyerson et al., 2011). Furthermore, specific timing of the data collection may also be important, because data that is taken too close to the event might not permit sufficient time for cognitive processing, or data that is taken after a prolonged period after trauma may be biased by memory or have less utility because of memory

decay. So with the appropriate time gap between the event of reference and assessment point would give more utilizable data. In the current study longitudinal design has been used. The major advantage of a longitudinal study over a cross-sectional study is that the developmental changes of an individual for a certain outcome variable can be studied over time.

In this study, we tested the original PTG model that was initially proposed by Tedeschi and Calhoun (2004) that theorized that psychological distress, trauma responses, rumination process, social support and coping styles would mediate the relationship between trauma appraisal and PTG. Whereas, demographic variables, (i.e., time passed since trauma, gender, age, education, and SES etc.) moderate the relationship. PTG theorists states that sufficient amount of distress is needed to provoke deliberate rumination and subsequent PTG. Moreover, they posit that most of the time with the passage of time intrusive rumination converts into more deliberate rumination and growth occurs. Past literature is flooded with the evidences that rumination, more specifically, brooding rumination contributes to the development and maintenance of the distress and meanwhile with the coping processes and social processes, deliberate rumination emerges, that subsequently leads to PTG. Deliberate rumination is considered as the strongest predictor of PTG with time.

The severity of the trauma is an important etiological factor both for the stress and growth. Past researchers have raised questions like, how much amount of trauma is required to trigger growth. Each disaster constitutes a complicated set of existential characteristics the survivors experience in highly variable ways. Determining the survivor's appraisal about traumatic event is a complex task (Baum & Davidson, 1986; Bolin, 1988; Weaver, 1995). There are two types of exposures to trauma; one is the subjective appraisal (emotional responses to trauma) and other is the objective

severity of the event itself. It may happen that an individual subjectively appraise an event very stressful despite low objective intensity and similarly an event might be objectively rated as very stressful but the individuals subjectively rated it less severe (Aisenberg, Ayón, & Orozco-Figueroa, 2008). Thus, not only the objective severity of the stressors, but also the subjective appraisal of the disaster has a role in the outcome. That's why findings regarding the association between the trauma severity and PTG are mixed. The possible reason of these mixed findings may be associated with the differences in the operationally definitions of trauma. However, most the available definitions are based on the DSM criteria that include both objective exposures to a traumatic event as well as subjective emotional response to it.

However, a number of factors within the trauma affect the risk of developing posttraumatic stress or distress in survivors (Norris et al., 2002; Weaver, 1995). The survivors' characteristics may include, how much physical pain, fear of personal injury, or danger was involved? Or how many deaths or injuries were seen? These questions may influence the impact of trauma. Besides, trauma characteristics or the duration of the trauma is also important—was it quick or did it last over time? Whether it was a one-time event or episodic? Chronic, more severe, prolonged and intentionally malicious traumas cause greater psychological damage than shorter, milder, single-episode, and unintentional traumas.

For example, Bolin (1986) demonstrated several trauma characteristics that influence the level of impact on the survivors or the community: It includes the duration of impact; fear and terror involved in witnessing or experiencing the event; pre-disaster emotional state of the survivors, impact ratio, or suffering loss or proportion of the community directly influenced; unexpectedness of the event threat, socio-cultural changes, availability of social support networks; symbolism of events,

and ability to manage stress and control over events (Weaver, 1995). While other trauma researchers have suggested few other characteristics of disaster that are important to consider: that includes; speed of onset of trauma, scope of impact, duration of impact, and social preparedness as well as to see the trauma in terms of type of disaster, degree of personal impact, duration of disaster, control over future impact and potential for recurrence.

In addition, few aspects that are essential to understand the stress of disaster are the unfamiliarity of the crisis, lack of preparation of the involved population in the disaster, length of involvement, rapidity and depth of involvement, predictability and recurrency of involvement of the population in the disaster. So, for the better understanding the trauma affected individuals and while devising the management and intervention plans for the trauma survivors all these above mentioned characteristics are imperative to consider.

A relatively new variable “centrality of event” has gained much attention in trauma research. It has been considered a unique predictor of both PTS and PTG, although it is still not clear if centrality of event is a unique predictor to traumatic outcomes beyond the effect of other variables known to do so. This underscores the need for further research, particularly in the premises that concerns the perceived valence of a traumatic event that may be interpreted as central. A thorough examination of this variable might be helpful in understanding the intensity of pathology and the level of growth. Mental health professionals may consider the centrality of event while working with victims who have faced an adverse or traumatic event (Boals & Schuettler, 2011; Groleau, Calhoun, Cann, & Tedeschi, 2013).

There are certain variables that may act as the confounding and we have very little or no control on these factors. For example, the area from where we collected data are flood prone areas. Almost every year these areas are under the flood warnings or residents of these areas have the some sort of anxiety regarding the future flood. So we were not able to measure that how much stress and anxiety was because of the exposure of the flood and how much was because of the future flood-related rumours. Despite the fact that, we assessed the effects of flood 2010, however, the constant uncertainty regarding future calamities may confound the results. Hence, the future research should consider the area of residence and other demographic characteristics of sample (Andrykowski, Steffens, Bush, & Tucker, 2015). In the current study, we had no control over the anniversary effects. These reactions may confound our findings. Anniversary effects are sometimes called anniversary reactions. An amelioration of stress near about the anniversary of a stressful event is known as anniversary reactions. It may include the reactions like, negative alterations in mood, unsettling feelings, mild arousal, and reactivity etc. These unwanted memories may be triggered by trauma reminders. Typically, these reactions may be gradually declined following the annual reminder. Past empirical studies have shown small increases in distress at the time of the trauma anniversary (Assanangkornchai, Tangboonngam, Sam-Angsri, & Edwards, 2007).

It is, however, important to note that not all survivors experience the anniversary reactions. Quite contrary to the above mentioned findings, Abel and Kruger (2006) demonstrated that the anniversary of a negative traumatic event or disaster also can provide an opportunity for emotional healing.

The road to recovery is distinctive for each person. In some cases, posttraumatic stress resolves fairly quickly. In many cases, recovery is a marathon, not a sprint. PTS places in a obscure valley. However, this is a transitory disturbance, not an endpoint. Healing steps startwith the upward climb, some of the time two steps forward and one step back. PTG, however, seems to protect the individuals from the negative impacts of the trauma. Often the course of change is not smooth, and one may feel like that one is deteriorating before one improves. With time one will gain the point of recovery and be ready to pick up where one left off. Hence, long-lasting growth despite the extreme adversity can be attained. In other words, "healing occurs when traumatic memory is cognitively processed or integrated" (Schiraldi, 2009, pp 51-53).

Future studies are helpful in extending the findings of the present study, replicate it with other samples, and address the limitations. We did not explore the inevitable role of culture and religion with relation to PTS, PTG, and flood related ruminations. Religion and personal philosophy may have a role in shaping the personal beliefs regarding the meaning or cause of a disaster. There are specific religion and culture of these areas from where we have collected the data. Almost the entire study sample was Muslims. They have their own belief systems and personal philosophies. For instance, some perceive disaster as "God's will," as a form of punishment, or simply as fate. So the others see it as an act of nature or of man. Hence, to other cultures that have diverse religious and cultural heritage, results of our research may have limited generalizability. We did not gauge the existing religious status of the sample. It may remain unclear whether already religious people have used the religious coping or the people used the religious coping as a method of

coping independent of prior religiosity. Thus the future studies should further consider the relationship between the current level of religiosity and religious coping.

In addition, measures translated and adopted for use in the current research were not evaluated for the religious sensitivity, despite the fact that they showed satisfactory psychometrics in terms of reliability and validity in past studies and also in the current study. Hence, future research would consider the role of beliefs, the meanings they give to the disaster and the coping mechanisms. Besides, culture also inadvertently plays a role in how effective or ineffective society may be in dealing with large-scale disaster.

Instead of taking data via questionnaire surveys alone, future research may use focus group discussions and individual interviews. In comparison to self-report measures, interview methods are considered the “gold standard” as they allow a much deeper understanding of the disaster impact. Questionnaire methods are also criticized for not accurately assess the nature and intensity of a disorder (Grant & McMahon, 2008). In addition, indigenous and culturally sensitive measures for all variables of interest should be used for future research. The question whether Western measures could be used with non - Western samples has been a hot debated (Hollifield et al., 2002). Despite the fact that, there are empirical evidences that PTG, general distress, posttraumatic stress and can be measured in a Pakistani population in a valid way. However, further research is needed that is directed towards devising a valid, culturally sensitive and context-specific PTS and PTG scale for flood survivors(Ahmer et al., 2007).Moreover, it may use some validated instrument of PTS that is based on the DSM-V criteria to gain a better understanding of the PTS symptom clusters.

The utilization of a longitudinal study design and inferences drawn based on the longitudinal study are the strength of the current study. Dropout in longitudinal studies is common. Specifically, in longitudinal randomized controlled trials it is a potential source of bias (Bell, Kenward, Fairclough, & Horton, 2013), as this threatens the validity of results. However, to see the possibility that differential dropout might have influenced the eventual models in our study. Demographic Analysis showed that the drop out at three time points on the variables of gender and age is not different. The drop out on study variables is less than one standard deviation. That shows that the dropout among the samples was not significant.

In this study, we have used a large sample and a retrospective design to examine trajectories of trauma and growth following a natural disaster. Further studies on the similar vein are warranted. Findings suggest the importance of utilizing prospective population based data. In addition, the current study catered flood affected population and hence may pose challenges regarding to the generalizability of results or whether findings can be extended to other kinds of disasters or to other trauma victims or to other cultures and geographical backgrounds. Ideally, future research ought to use prospective designs that might use qualitative methods to evaluate why and how adversity contributed to PTG (Karanci et al., 2012; Silva et al., 2012; Song & Ryun, 2014).

Recommendations and Implications

PTG is an area of well-being meriting additional research and clinical consideration. These results may guide psychosocial interventions for the flood affected population. Facilitation of PTG in survivors is crucial to all helping

professions because PTG has stress-buffering role. The findings suggest that for the attainments of PTG, healthcare providers ought to facilitate survivors using personal assets, comprehend PTG coexists with PTS symptoms, and adjust interventions based on the coping styles they have adopted. For instance, mental health professionals encourage victims to utilize “acceptance coping strategies” instead avoidant coping strategies, because active coping strategies can help people make the most out of the adversity (Roepke, 2014). Findings also underscore the benefit of advancing adaptive coping strategies in order to improve psychological adjustment and growth in flood survivors. By utilizing a systematic therapeutic approach to improve positive, problem-focused, and acceptance coping strategies in flood affected individuals may be helpful for gaining PTG.

In addition, promising intervention such as CBT that addresses symptoms of traumatic stress has the additive effects (Calderon-Abbo, Kronenberg, Many, & Ososfsky, 2008; Knaevelsrud, Liedl, & Maercker, 2010; Yu, et al., 2014). Rumination-focused interventions (Borders et al., 2012), cognitive behaviour interventions (Knaevelsrud, Liedl, & Maercker, 2010) and solution-focused brief therapy (SFBT) is helpful in enhancing the PTG (Zhang, Yan, Du & Liu, 2014). Mindfulness-based stress reduction programs are widely used for reducing stress and enhancing the reflective thinking (Cheng, Lau, Mak, Ng, & Lam, 2014; Cook & Watkins, 2016; Garland, Carlson, Cook, Lansdell, & Speca, 2007; Shakespeare-Finch & Barrington, 2012; Smith, Samsa, Ganz, & Zimmerman, 2014; Wagner, Knaevelsrud, & Maercker, 2007). Considering positive changes might provide additional perspectives for rehabilitation (Dirik & Karanci, 2008; Penedo et al., 2006; Zoellner et al., 2010). Understanding the factors which aim to reframing the trauma experience, may help in designing educational support and consulting programs for

survivors and their families (Lafarge, Mitchell, & Fox, 2017; Khanjani, Younesi, Khankeh, & Azkhosh, 2017).

Psychosocial intervention programs and emotional management programs might be helpful to endure distress, promote adjustment and enhance PTG (Kuenemund, Zwick, Rief, & Exner, 2014; Lee & Kim, 2012; Li et al., 2012). Health-providers can promote the recovery by accelerating PTG (Silva et al., 2012; Turner-Sack et al., 2012; Wang et al., 2012; Wang et al., 2013). Psychological interventions for survivors should not only include the various functions and sources of social support but also should examine the effects of subtypes of social support on PTG separately (Jia, Ying, Zhou, Wu, & Lin, 2015). Clinicians should focus on to facilitate the growth experiences by enhancing the survivors view on how they serve to benefit individuals. Not only the disaster survivors should be made aware of the importance of social support, but also the social surroundings of the survivors ought to be informed about the significance of family and friends support; In addition, a goal for clinicians and researchers may be to understand the interactions of the ecological and psychosocial factors for facilitating growth over psychopathology.

Emotional disclosure in any form (written, talking to an active facilitator, talking to a passive listener, private spoken) is valuable for enhancing growth (Slavin-Spenny, Cohen, Oberleitner, & Lumley 2011). Furthermore, Gene-environment interaction (GxE) researches could offer new insight and understanding into the factors underlying variability in post-trauma emotional responses (Dunn et al., 2014). However, Future research is helpful to deeply apprehend potentially related and distinct effects for social processes in relation to PTG that occur despite stress; PTG independent of stress; and PTG that require stress exposure (Meyerson et al., 2011). Policies and practices should be devised which identify those disaster survivors who

are at greater risk for PTS. As mostly survivors typically manage the distress and trauma symptoms without any psychopathology. It suggests the critical examination of rumination and coping. Moreover, in therapeutic or in community settings, deliberate ruminations should be encouraged. To get the positive outcomes after the disasters, programs on management and adjustment of PTS should be implemented. Moreover, psychological interventions for survivors of flood disaster ought to focus on vulnerable individuals, such as females, who can be more affected by disasters (Xu & Liao, 2011). Further research is needed to clarify the relationship between growth and other indices of psychological adjustment, while delineating the nature of cognitive processing, and comprehend the trajectory of growth over the period of time for survivors with flood disasters.

Further longitudinal studies and path analysis may be helpful in examining the causal relationship among traumatic events, rumination, PTG and further identify the reciprocal and mediational relationships between psychological resources, PTS, and PTG (Hallam & Morris, 2014). It may also investigate which aspects of trauma can suppress or trigger rumination and should look at change longitudinally (Taku, Cann, Tedeschi, & Calhoun, 2015). Further research ought to examine the mediating role of core beliefs in the relationship between trauma and growth using a longitudinal design to explore the stress-buffering role of PTG and potential clinical value of PTG.

The study has certain implications. To understand the different vehicles of change has implications for facilitation of PTG in trauma survivors (Woodward & Joseph, 2003). The present study may be helpful in raising awareness about the relationship and interplay between trauma and growth and may prove to be a base line study for future researchers. The study may also helpful for researchers working on trauma and growth caused by exposure to violence, and extreme forms of sexual and

physical abuse and other man-made and natural disasters. Mental health professionals and clinicians may get benefit by using evidence based interventions to mitigate the distress, systematic therapeutic approach to facilitate PTG, and find ways to maintain this growth with the passage of time (Kilmer et al., 2014; Tedeschi, 2011; Tsai, Sippel, Mota, Southwick, & Pietrzak, 2016; Turner-Sack et al., 2012).

Flood events have significant social, environmental, and economic implications both at a community level and in regions affected by extensive flooding where floods still have potentially huge cumulative effects (Few & Matthies, 2006). However, the type of trauma sustained could have differing processes and outcomes (Sabiston, McDonough, & Crocker, 2007).

Study had the implications for mental health professionals in enhancing functioning and psychological well-being and minimizing maladaptive functioning and subjective distress. Further research will be helpful in identifying correlates and provide guidance for mental health practitioners on counseling to severe affected individuals to promote growth (Paul et al., 2010).

The current study has the implications for the disaster mental health policy management. Socio-demographic characteristics of the trauma survivors should be taken into consideration when long-term mental health policies are planned on a government level (Calderon-Abbo et al., 2008). In addition, the component of PTG should be added as a significant element in disaster planning programme and such policies should be based on an 'outreach' model.

Conclusion

The results demonstrate that PTG is a valuable concept in trauma psychology that suggested that difficult situations inspire ingenious solutions. The relations of PTG to other clinical, cognitive, and social variables may be more perplexing and dynamic than previously assumed. Our findings highlight the concept that resources within the survivors and in the environment are essential to understand growth than the mere passage of time. Results suggest the critical role of rumination patterns in the development of PTG over time. By and large, both types of ruminations and particularly deliberate rumination are important to resolve the distress and facilitate the growth. Thus, rumination may influence outcomes through distinct pathways. Our findings support the theoretical model that PTG is adaptive and it results from the cognitively processing of the trauma and that coping and social support may explain and influence this growth. It has various courses and can persist over time even in the presence of PTS and distress. By conceptualizing the trajectories of traumatic reactions; we will be better qualified and informed in our efforts to help survivors of trauma to facilitate their resilience, recovery, and growth. Traumatology research area has vital implications for redefining the trauma victims as individuals capable of positive change rather than merely surviving.

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A

CONSENT FORM

قومی ادارہ نفسیات، قائد اعظم یونیورسٹی اسلام آباد ایک ایسا ادارہ ہے جو تعلیم اور تدریس کے علاوہ انسانی، معاشرتی اور سماجی نفسیات سے متعلق مختلف موضوعات اور مسائل پر تحقیقات کرتا ہے۔ موجودہ تحقیق گذشتہ سیلاب کے بعد آپ کی زندگی میں کس طرح کی تبدیلیاں آئی ہیں ان کا مطالعہ ہے۔ آپ کے جوابات اس مقصد کو حاصل کرنے کے لئے نہایت مددگار ہوں گے۔

ہم آپ کو مکمل یقین دلاتے ہیں کہ آپ کی دی گئی معلومات کو صیغہ راز میں رکھا جائے گا اور اس کو صرف تحقیقی نتائج اخذ کرنے کے لئے استعمال کیا جائے گا۔

ہم آپ کے اس تحقیق میں تعاون کے لئے بے حد ممنون ہوں گے۔ آپ کے پاس مکمل اختیار ہے کہ دوران تحقیق کسی بھی وقت معلومات فراہمی سے معذرت کر سکتے ہیں۔

اگر آپ تحقیق میں شرکت کے لئے رضامند ہوں تو نیچے دی گئی جگہ پر اپنا نام اور دستخط کر دیں۔

نام: _____

دستخط: _____

آپ کے تعاون کا شکریہ

اینیہ کمال / نعیم آ

قومی ادارہ نفسیات، قائد اعظم یونیورسٹی اسلام آباد

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mail Psy_naeem@yahoo.com

A i

Demographic Sheet

نام: _____
عمر: _____
جنس: _____
تعلیم: _____ سال

ازدواجی حیثیت 1- غیر شادی شدہ

2- شادی شدہ (شادی کو کتنے سال ہوئے) _____

3- بیوہ /رنڈوا

ملازمت (ہاں / نہیں)

ملازمت کی نوعیت _____ سرکاری ملازم / پرائیویٹ / ذاتی کاروبار

ذرائع آمدن آپ خود یا گھر کا کوئی اور فرد _____

مجموعی ماہانہ آمدن آپ کی اپنی _____ گھر کے دیگر افراد کی _____

افراد خانہ کی تعداد _____

کبھی کسی ذہنی / نفسیاتی مرض کا شکار ہوئے (ہاں / نہیں) اگر ہوئے تو مرض کی نوعیت _____

کسی جسمانی مرض کا شکار ہوئے (ہاں / نہیں) اگر ہوئے تو مرض کی نوعیت _____

کیا آپ گزشتہ سال سیلاب میں متاثر ہوئے۔ (ہاں / نہیں)

اگر ہوئے تو کیا نقصانات ہوئے _____

گزشتہ سیلاب کے واقعے کے بعد یا اس دوران کسی اور پریشان کن صورتحال کا شکار ہوئے،

اگر ہاں تو کس واقعے کا _____

مستقبل میں خط و کتابت کا پتہ _____

رابطہ نمبر (فون نمبر) _____ email _____

(A ii)

FLOOD RELATED EXPOSURE SCALE

سیلاب کے دوران کیا ہوا؟ نیچے دیئے گئے سوالات کو غور سے پڑھیں اور بتائیں کہ سیلاب کے دوران آپ کس تجربے سے گزرے اور آپ نے کیا محسوس کیا۔ اپنے تجربے کی شدت کے لحاظ سے نیچے دیئے گئے 0 1 2 3 4 میں سے کسی ایک پر ✓ نشان لگائیں۔

نمبر شمار	بیانات	بالکل نہیں	تھوڑا بہت	کسی قدر	بہت زیادہ	بہت ہی زیادہ
		0	1	2	3	4
1	آپ سیلاب میں بُری طرح پھنس گئے تھے۔					
2	آپ کا کوئی قریبی دوست ر عزیز بُری طرح سیلاب میں پھنس گیا تھا۔					
3	آپ سیلاب میں شدید زخمی ہو گئے تھے					
4	آپ کے ساتھ دوسرے لوگ شدید زخمی ہو گئے تھے۔					
5	آپ نے اس دوران کسی کو شدید زخمی ہوتے ہوئے دیکھا۔					
6	آپ نے سیلاب کے دوران لوگوں کو مرتے ہوئے دیکھا۔					
7	کسی قریبی یا دوست کی وفات یا شدید زخمی ہونے کے بارے میں سنا۔					
8	آپ خوفزدہ ہو گئے تھے کہ میں مر جاؤں گا۔					
9	آپ خوفزدہ ہو گئے تھے کہ میں شدید زخمی ہو جاؤں گا۔					
10	آپ خوفزدہ ہو گئے تھے کہ میرا کوئی عزیز یا قریبی مر جائے گا۔					
11	آپ خوفزدہ ہو گئے تھے کہ آپ کا کوئی عزیز یا قریبی شدید زخمی ہو جائے گا۔					

(B)

DEPRESSION ANXIETY AND STRESS SCALE

نوٹ: مندرجہ ذیل بیانات میں سے جو گزشتہ ایک ہفتے کے دوران آپ پر صحیح ثابت ہوئے ہوں ان کے سامنے 0, 1, 2, 3 میں سے کسی ایک ہندسہ (✓) پر نشان لگائیں واضح رہے کہ آپ کے جوابات کو صحیح یا غلط تصور نہیں کیا جائے گا۔ کسی بھی بیان پر زیادہ وقت ضائع نہ کریں۔

نمبر شمار	بیانات	کبھی نہیں 0	کبھی کبھار 1	زیادہ تر وقت 2	ہر وقت 3
-1	میرے لیے پرسکون ہونا مشکل ہوتا رہا ہے۔				
-2	مجھے یہ احساس ہوتا رہا ہے جیسے میرا منہ خشک ہو رہا ہو۔				
-3	مجھے کسی قسم کے مثبت جذبات محسوس نہیں ہوئے۔				
-4	مجھے سانس لینے میں دشواری محسوس ہوتی رہی ہے (بغیر کسی جسمانی مشقت والے کام کے)۔				
-5	مجھے کسی کام کے کرنے کیلئے آغاز کرنا مشکل محسوس ہوتا رہا ہے۔				
-6	میں نے بعض حالات میں غیر ضروری ردعمل کا اظہار کیا۔				
-7	مجھے کپکپاہٹ محسوس ہوتی رہی ہے (مثلاً ہاتھوں میں)۔				
-8	میں نے محسوس کیا کہ میں بہت زیادہ ذہنی توانائی استعمال کر رہی / رہا ہوں۔				
-9	میں ایسے حالات سے گھبراتی / گھبراتا رہا جن میں میرے احمق بننے اور میری بے چینی بڑھنے کا خدشہ ہوتا ہے۔				
-10	میں اپنا مستقبل تاریک محسوس کرتی / کرتا رہا۔				
-11	مجھے اپنے آپ میں چڑچڑاپن محسوس ہوتا رہا۔				
-12	میں ذہنی طور پر سکونی محسوس کرتی / کرتا رہا ہوں۔				
-13	میں اداسی محسوس کرتی / کرتا رہا۔				
-14	میرے لیے اس چیز یا شخص کو برداشت کرنا مشکل رہا ہے جو میرے کام میں رکاوٹ پیدا کرے				
-15	مجھے محسوس ہوتا رہا ہے کہ جیسے مجھے دورہ پڑنے لگا ہے۔				
-16	مجھے کسی بھی کام میں دلچسپی نہیں رہی۔				
-17	مجھے محسوس ہوتا رہا کہ میں کسی قابل نہیں ہوں۔				
-18	مجھے محسوس ہوتا رہا کہ میں بہت جذباتی ہو جاتی / جاتا ہوں۔				
-19	مجھے بلاوجہ بغیر کسی جسمانی مشقت کے دل کی دھڑکن تیز محسوس ہوتی رہی۔				
-20	میں بغیر کسی وجہ کے خوفزدہ ہو جاتی / جاتا رہا۔				
-21	مجھے یہ احساس ہوتا رہا کہ میری زندگی بے معنی ہے۔				

(D i)

EVENT RELATED INTRUSIVE RUMINATION

کسی تجربے سے گزرنے کے بعد جیسا کہ آپ سیلاب کے تجربے، سے گزرے ہیں۔ لوگ بعض اوقات، ضروری نہیں کہ ہر وقت ہی اپنے آپ کو اس تجربے کے بارے میں، غیر ارادی طور پر سوچتا ہوا پاتے ہیں حالانکہ انہوں نے ایسا کچھ سوچنے کی کوشش نہیں کی ہوتی۔ نیچے دیے گئے بیانات سے نشاندہی کریں سیلاب کے فوراً بعد یا گزشتہ چند ہفتوں سے آپ کو کس قدر اس کا تجربہ ہوا۔

پیمائش کا درجہ کچھ یوں ہے۔

3 2 1 0
اکثر کبھی کبھار بہت کم ہرگز نہیں

نمبر شمار	بیانات	0	1	2	3
		ہرگز نہیں	بہت کم	کبھی کبھار	اکثر
		0	1	2	3
1	میرے ذہن میں اس وقت بھی اس واقعے کی سوچ آتی ہے جب میں سوچنا نہیں چاہا رہی رہا ہوتا				
2	سیلاب کے بارے میں خیالات خود بخود میرے ذہن میں آتے ہیں اور میں اپنے آپ کو ان کے بارے میں سوچنے سے نہیں روک سکتی / سکتا۔				
3	واقعہ کے بارے میں خیالات نے میرا ذہن منتشر کر دیا ہے اور میں توجہ مرکوز نہ رکھ پاتی / پاتا۔				
4	واقعہ سے متعلق تصورات اور خیالات کو میں اپنے ذہن میں داخل ہونے سے نہیں روک سکتی / سکتا۔				
5	واقعہ سے متعلق خیالات، یادیں یا تصورات اس وقت بھی میرے ذہن میں آتے ہیں جب میں ایسا نہیں چاہتی / چاہتا۔				
6	واقعہ کے بارے میں خیالات میرے اس تجربے کو جیسے دوبارہ تازہ کر دیتے ہیں۔				
7	واقعہ کے بارے میں کوئی بھی یاد دہانی اس تجربے کو ذہن میں تازہ کر دیتی ہے۔				
8	میں اپنے آپ کو خود بخود اس واقعہ کے بارے میں سوچتا ہوا پاتی / پاتا ہوں۔				
9	دوسری چیزیں بھی مجھے اس تجربے کی جانب سوچنے پر مائل کرتی ہیں۔				
10	میں نے چاہا کہ اس واقعہ کے بارے نہ سوچوں، مگر میں ان خیالات کو اپنے ذہن سے دور نہیں رکھ سکتی / سکتا۔				

(D ii)

EVENT RELATED DELIBERATE RUMINATION

کسی تجربے سے گزرنے کے بعد جیسا کہ آپ سیلاب کے تجربے سے گزرے ہیں۔ لوگ بعض اوقات، ضروری نہیں کہ ہر وقت ہی جان بوجھ کر بار بار ادائیگی اپنے تجربے کے بارے میں غور و فکر کرنے کے لئے وقت صرف کرتے ہیں۔ نیچے دیے گئے بیانات کے حوالے سے بتائیے کہ آپ کس قدر اراداً سیلاب کے بعد کے چند ہفتوں میں یا گزشتہ چند ہفتوں سے اس واقعہ کے بارے میں سوچتے رہے۔

نمبر شمار	بیانات	ہرگز نہیں	بہت کم	کبھی کبھار	اکثر
		0	1	2	3
1	میں نے غور کیا کہ آیا میں سیلاب کے اس تجربے سے کوئی معنی اخذ کر سکتا رہتی ہوں۔				
2	میں نے غور کیا کہ کیا میری زندگی میں جو تبدیلیاں آئیں ہیں وہ ان تجربات کی وجہ سے ہیں۔				
3	میں نے اپنے آپ کو اس تجربے سے وابستہ جذبات کے بارے میں سوچنے پر مجبور کیا۔				
4	میں نے غور کیا کہ کیا میں نے اپنے اس تجربے کے نتیجے میں کچھ سیکھا ہے۔				
5	میں نے اس بارے میں غور کیا کہ کیا اس تجربے نے دنیا کے بارے میں میرے خیالات بدل دیے ہیں۔				
6	میں نے اس تجربے کے اپنے مستقبل پر ہونے والے ممکنہ اثرات پر غور و فکر کیا۔				
7	میں نے غور کیا کہ کیا اس واقعے کا تجربہ کرنے کے بعد میرے لوگوں کے ساتھ تعلقات میں تبدیلی آئی ہے۔				
8	میں نے اپنے آپ کو اس واقعے سے متعلق احساسات پر غور کرنے پر مجبور کیا۔				
9	میں نے اراداً یہ سوچا کہ اس واقعے نے مجھے کس طرح متاثر کیا تھا۔				
10	میں نے اس واقعے کے بارے میں غور کیا اور جو کچھ ہوا اسے سمجھنے کی کوشش کی۔				

(E)

PSYCHOLOGICAL WELBEING SCALE

نیچے دیے گئے بیانات کو پڑھیں اور بتائیں کہ پچھلے چند ہفتوں میں یہ آپ پر کس قدر صبح ثابت ہوئے ہیں۔ 0 1 2 3 میں سے کسی ایک پر (✓) نشان لگائیں۔

نمبر شمار	بیانات	کبھی نہیں 0	کبھی کبھار 1	زیادہ تر وقت 2	ہر وقت 3
1	میں بار بار روتا / روتی ہوں یا مجھے لگتا ہے کہ مجھے رونا آرہا ہے۔				
2	میں بہت بچھا / بچھی ہوئی اور غمزہ محسوس کرتا / کرتی ہوں				
3	میں بغیر کسی وجہ کے خوف محسوس کرتا / کرتی ہوں۔				
4	میں آسانی سے پریشانی یا گھبراہٹ محسوس کرنے لگتا / لگتی ہوں۔				
5	میں توانا، پھرتیلا اور مضبوط محسوس کرتا / کرتی ہوں۔				
6	میں سُستی محسوس کرتا / کرتی ہوں۔				
7	میں خود کو بہت تھکا ہوا محسوس کرتا / کرتی ہوں۔				
8	میں صبح اٹھنے کے بعد خود کو چاق و چوبند اور آرام دہ محسوس کرتا / کرتی ہوں۔				
9	میں ذاتی زندگی سے مطمئن اور خوش ہوں۔				
10	میں ویسی ہی زندگی گزار رہا / رہی ہوں جیسے میں پسند کرتا / کرتی ہوں۔				
11	میں اپنے روزمرہ کے کام کرنے اور نئے فیصلے کرنے میں دلچسپی رکھتا / رکھتی ہوں۔				
12	میں نے محسوس کیا ہے کہ میں اپنی زندگی میں آنے والے سنجیدہ مسائل اور بڑی تبدیلیوں کا مقابلہ آسانی سے کر سکتا / سکتی ہوں۔				

(F)

MULTIDIMENSIONAL PERCEIVED SOCIAL SUPPORT SCALE

ہدایات

نیچے دیے گئے بیانات کے بارے میں آپ کے تاثرات جاننا چاہتے ہیں۔ ہر بیان کو غور سے پڑھیں اور بتائیں کہ آپ اس کے بارے میں کیا محسوس کرتے ہیں۔

- 1- پریشان لگائیں اگر آپ مکمل طور پر غیر متفق ہیں۔
- 2- پریشان لگائیں اگر آپ غیر متفق ہیں۔
- 3- پریشان لگائیں اگر آپ تھوڑا سا غیر متفق ہیں۔
- 4- پریشان لگائیں اگر آپ نہ تو متفق ہیں اور نہ ہی غیر متفق۔
- 5- پریشان لگائیں اگر پر کچھ کچھ متفق ہیں۔
- 6- پریشان لگائیں اگر آپ مکمل متفق ہیں۔
- 7- پریشان لگائیں اگر آپ بالکل مکمل طور پر متفق ہیں۔

نمبر شمار	بیانات	مکمل طور پر غیر متفق	غیر متفق	تھوڑا سا غیر متفق	نہ تو متفق اور نہ ہی غیر متفق	کچھ کچھ متفق	مکمل متفق	بالکل مکمل طور پر متفق
		1	2	3	4	5	6	7
1	ایک ایسا خاص شخص ہے جو ضرورت پڑنے پر میرے ارد گرد موجود ہوتا ہے۔							
2	ایک ایسا خاص شخص ہے جس کے ساتھ میں اپنی خوشیاں اور غم بانٹ سکتا رہتی ہوں۔							
3	میرے گھر والے واقعی میری مدد کرنے کی کوشش کرتے ہیں۔							
4	ضرورت پڑنے پر مجھے اپنے گھر والوں کی طرف سے جذباتی مدد اور حمایت حاصل رہتی ہے۔							
5	ایک ایسا خاص شخص ہے جو میرے لئے واقعی سکون کا باعث ہے۔							
6	میرے دوست واقعی میری مدد کے لئے تیار ہیں۔							
7	جب بھی مجھے کوئی مسئلہ ہوتا ہے میں اپنے دوستوں پر انحصار کر سکتا رہتی ہوں۔							
8	میں اپنے مسائل کے بارے میں گھر والوں سے بات کر سکتا رہتی ہوں۔							
9	میرے ایسے دوست ہیں جن کے ساتھ میں اپنی خوشیاں اور غم بانٹ سکتا رہتی ہوں۔							
10	میری زندگی میں ایک ایسا شخص ہے جو میرے جذبات کا خیال کرتا ہے۔							
11	میرے گھر والے فیصلے کرنے میں میری مدد کے لئے تیار رہتے ہیں۔							
12	میں اپنے دوستوں کے ساتھ اپنے مسائل پر بات کر سکتا رہتی ہوں۔							

(G)

POSTTRAUMATIC GROWTH INVENTORY (PTGI-SF)

ہدایات:

اس سوالنامہ میں کچھ بیانات لکھے ہوئے ہیں۔ آپ ہر بیان کو غور سے پڑھیں اور اس کے سامنے دیئے گئے نمبرز 0, 1, 2, 3, 4, 5 میں سے جو بیان آپ کے لئے مناسب ہو اس پر نشان لگائیں۔ اس بات کو مد نظر رکھتے ہوئے (✓) کا نشان لگائیں کہ گذشتہ سیلاب کے بعد آپ کے اندر کس قدر تبدیلی آئی ہے

ت ہیں۔ ان میں سے جو بھی

کسی حد تک متفق	کافی حد تک متفق	بہت زیادہ متفق

نمبر شمار	بیانات	بالکل نہیں	بہت کم	کسی حد تک	درمیانے درجے تک	کافی حد تک	بہت زیادہ
		(0)	(1)	(2)	(3)	(4)	(5)
1.	سیلاب کے بعد زندگی میں اہمیت کے لحاظ سے میں نے اپنی ترجیحات بدل دی ہیں۔						
2.	میرے لئے اپنی زندگی کی اہمیت پہلے سے بڑھ گئی ہے۔						
3.	میں پہلے سے زیادہ اپنی زندگی میں بہتر چیزیں کرنے کی صلاحیت رکھتا رکھتی ہوں۔						
4.	میں روحانی معاملات کو پہلے سے زیادہ اچھی طرح سمجھنے لگا ہوں / لگی ہوں۔						
5.	میں اپنے آپ کو پہلے سے زیادہ دوسروں کے زیادہ قریب سمجھنے لگا ہوں / لگی ہوں۔						
6.	میں نے اپنی زندگی کے لئے نیا راستہ چن لیا ہے۔						
7.	میں اچھی طرح جانتا جانتی ہوں کہ میں مشکلات کو حل کر سکتا ہوں / سکتی ہوں۔						
8.	میرا مذہبی عقیدہ پہلے سے زیادہ پختہ ہو گیا ہے۔						
9.	مجھے لگتا ہے کہ میں اپنی سوچ سے زیادہ مضبوط ہوں۔						
10.	میں نے اچھی طرح جان لیا ہے کہ لوگ کتنے اچھے ہوتے ہیں۔						

نمبر شمار	بیانات	کبھی نہیں	بہت کم	کبھی کبھی	بہت زیادہ
14	میں ناخوشگوار صورتحال کے بارے میں کچھ کرنے کے لئے ایک حکمت عملی تلاش کرنے کی کوشش کرتا / کرتی رہی ہوں۔				
15	میں کسی دوسرے سے آرام اور ہم خیالی حاصل کرتا / کرتی رہی ہوں۔				
16	میں ناخوشگوار صورتحال پر قابو پانے کی کوشش ترک کرتا / کرتی رہی ہوں۔				
17	جو کچھ ہو رہا ہے میں اُس میں کچھ بہتر پہلوؤں دیکھنے کی کوشش کرتا / کرتی رہی ہوں۔				
18	میں ناخوشگوار صورتحال کے بارے میں مزاح پیدا کرتا / کرتی رہی ہوں۔				
19	میں اس صورتحال کے بارے میں کم سوچنے کے لئے کچھ نہ کچھ کرتا / کرتی رہی ہوں جیسے فلم دیکھنے کے لئے جانا، ٹی وی دیکھنا، پڑھنا، دن میں خواب دیکھنا، سونا یا خریداری کرنا۔				
20	میں اس حقیقت کو تسلیم کرتا / کرتی رہی ہوں کہ کوئی ناخوشگوار واقعہ رونما ہو چکا ہے۔				
21	میں اپنے منفی جذبات کا اظہار کرتا / کرتی رہی ہوں۔				
22	میں اپنے مذہب یا روحانی عقائد میں سکون تلاش کرنے کی کوشش کرتا / کرتی رہی ہوں۔				
23	ناخوشگوار صورتحال کے متعلق کچھ کرنے کے لئے میں دوسرے لوگوں سے مدد اور مشورہ لینے کی کوشش کرتا / کرتی رہی ہوں۔				
24	میں اس صورتحال کے ساتھ گزارہ کرنا سیکھتا / سیکھتی رہی ہوں۔				
25	میں اس بارے میں بہت غور کرتا / کرتی رہی ہوں کہ کیا اقدامات کروں۔				
26	جو کچھ ہوا اُس کے لئے میں اپنے آپ کو قصور وار ٹھہراتا / ٹھہراتی رہی ہوں۔				
27	میں عبادت اور دُعا کرتا / کرتی رہی ہوں۔				
28	میں حالات کو مذاق میں اُڑاتا / اُڑاتی رہی ہوں۔				