

# The prevalence of post-traumatic stress disorder among landslide victims

## Abstract

Malaysia has been prone to both natural and man-made disasters such as droughts, flood, landslides, haze and others. These disasters affect livelihoods, destroy infrastructure, cause food shortages and health problems. People exposed to natural disasters have a greater risk of experiencing mental health problems, including post-traumatic stress disorder (PTSD). This must have been a terrible experience with psychological consequences. The purpose of this study to investigate the prevalence of Post-Traumatic Stress Disorder (PTSD) among public that involved or have been a victim of landslides and to study the symptoms of trauma recovery by landslide for the benefit of well being. We assessed PTSD by using The Post-traumatic stress disorder checklist and Post Traumatic Growth Inventory for 500 respondent from five areas that hit by landslides. The post-traumatic stress disorder checklist, it is to test emotional trauma such as depression, psychological stress, fear, anxiety and others. The Post-traumatic Grow Inventory that test positive changes and development of the symptoms of trauma. The scale appears to have utility in determining how successful individuals, coping with the aftermath of trauma, are in reconstructing or strengthening their perceptions of self, others and the meaning of events. We are using mix methods for this research uses purposive and snow ball sampling. The result show, some of public who experience hit by landslide had been a trauma. The location of study that most highest trauma victims is Bukit Antarabangsa 16.4% and Paya Terubong 13.25. But most of them are back to normal after trauma were 55.2%. Although traumatic or distressing events can cause long-lasting psychological symptoms but, they may report an increased interest in spritual matter, increased maturity, improved social relations or a new and healthier lifestyle after a traumatic event.

**Keywords:** Trauma, Disaster, landslide, stress, Post-traumatic stress disorder, Post-traumatic growth Inventory

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## Introduction

Landslides have resulted in large numbers of casualties and huge economic loss in hilly and mountainous areas in Malaysia. Due to a rapid development since the 1980s, strategic and suitable low-lying areas for development have become increasingly and resulted make unavailable in Malaysia. Hence, the development of highland or hilly terrain has increased, particularly in areas adjacent to densely populated cities thereby exposing urban communities to an increased risk of landslides occurrence. Malaysia lies in a geologically stable region which is free from earthquakes, volcanic activities and strong winds such as tropical cyclones which periodically affect some of its neighbors. It lies geographically just outside "Pacific Ring Of Fire". But, that does not mean Malaysia is totally "Free" from natural disasters and calamities, as it is often hit by floods, droughts, landslides, haze, tsunamis and humanmade disasters.<sup>1</sup> Hence, the most tragedy disaster that hit Malaysia is landslide that affecting almost all continents of the world causing damage to life and property damage to life and property and massive disruption in transport/ supply network. A landslide is geological phenomenon which includes a wide range of ground movement, such as rock falls, deep failure of slopes and shallow debris flows, which can occur in offshore, coastal and onshore environments. Landslide can be categorizes based on the movement of soil mass, landslides failure surface and the duration of the movement. In general, soil mass moves failure surface from the

original area to the lower depositional area.<sup>2</sup> National Slope Master Plan<sup>3</sup> landslides are a massive mass of soil and rock debris that move downhill because of the action of gravity. The sheer mass of material involved and the speed at which they occur make them potentially disastrous as a consequences because of the massive damage that can cause to property and lives.

## Objectives of The Study

The main objectives of this study are:

1. To determine the Post-Traumatic Stress Disorder (PTSD) among public that have been a victim of landslides.
2. To examine the trauma recovery due to landslide for the benefit of well being.

## Research Hypothesis

H<sub>1</sub> : Public that have been a victim of landslides have a Post-Traumatic Stress Disorder

H<sub>2</sub> : Traumatic events due to landslides can produce positive physical and psychological impacts to the victims.

H<sub>3</sub> : There is a post-traumatic growth among public that have been a victim of landslides.

## Post-Traumatic Stress Disorder (PTSD)

Post traumatic stress disorder is a disorder that develops in some people who have experienced a shocking, scary, or dangerous event. It is natural to feel afraid during and after a traumatic situation. Fear triggers many split-second changes in the body to help defend against danger or to avoid it. The post-traumatic stress disorder (PTSD) first came into existence in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980.<sup>4</sup> Post-traumatic stress disorder widely occurs among victims or witness of disasters. Many of people who experience disasters develop mental and physical illnesses in the last decade, after a person experiences trauma, physiological, societal, economic and other factors may collectively contribute to the development of PTSD. Hence, exposure to a natural disaster can be a traumatic stressor affecting an individual's expectations about the future, challenging their existing world views, and triggering a number of cognitive and emotional reactions.<sup>5</sup> Victims of disasters experience life-threatening or unexpected events and are often displaced. As a result, these experiences cause both physical and mental trauma. Anxiety and other mental disturbances due to an extraordinary event are normal psychological reactions. Events in an individual's life such as accident or crime, can also lead to such reactions while large-scale disasters can affect entire communities. The impact of PTSD is vast, when individuals suffer a range that can disturbing symptoms that have a detrimental impact on their general well-being and quality of life.<sup>6</sup> PTSD is characterized by four clusters of symptoms: (i) re-experiencing intrusion, where the subject suffers from episodes of vivid recall of the trauma, possibly distorted; (ii) avoidance, where the subject attempts to minimize stimuli that evoke re-experience; (iii) numbing; and (iv) hyperarousal. A crucial component of reexperience is the presence of strong negative emotions that are similar to those experienced at the time of the trauma with little or no attenuation. Re-experience may occur as dreams with little or no apparent cue or it may be initiated by triggers that contain a reminder of circumstances surrounding the original trauma or are evocative of these circumstances. Smell appears to be a particularly powerful stimulus for re-experience, possibly due to the association between the olfactory projections and the limbic system which has been implicated in PTSD re-experience.<sup>7</sup> There is evidence that traumatic events can produce many negative physical and psychological consequences. Although, many studies just focus for the negative effects of trauma, there has been much less attention paid to the possibility of positive impact of negative events. Hence, there is literature suggesting that people emerging from their struggle with such tragedies as bereavement,<sup>8,9</sup> HIV infection,<sup>10</sup> heart attacks,<sup>11</sup> disasters<sup>12</sup> and combat.<sup>13</sup>

Positive personal gain after adverse life events and traumas is known as post-traumatic growth (PTG). Although traumatic or distressing events can cause long-lasting psychological symptoms. Many people that may experience like only mild and transient problems after horrible experiences and some more even stronger. They may report an increased interest in spiritual matter, increased maturity, improved social relations or a new and healthier lifestyle after a traumatic event.<sup>14</sup> There have many several factors are suggested to promote PTG after stressful events. Though conflicting findings exist, studies suggest that there may be less growth, associated with personal traumas such as physical or sexual harassment and accidents but more growth associated with shared traumas (i.e., disaster and loss).<sup>15</sup> Person coping with a traumatic event often draw the conclusion that they are stronger,<sup>16</sup> a confidence which may generalize to all

kinds of situations, including future traumas. The cognition of one's vulnerability can lead to more emotional expressiveness, willingness to accept help and therefore a utilization of social relationships comes from the increased sensitivity to other people and efforts directed at improving relationships.<sup>17</sup>

### Effects of Post-Traumatic Stress Disorder in Victim

Landslide are traumatic events that threaten people's safety. Since the past several decades, landslide drew the public attention for its frequent occurrence and huge destruction. According to Weimberg et al.,<sup>18</sup> a person who undergoes a traumatic experience will never forget it. Similarly, such traumatic experiences haunt victim that hit by landslide, enter their dreams, impacts their lives and change their perceptions of reality. Some victims lose their faith in mankind, distance themselves from people and from close connections, and shut themselves out psychologically or even physically. Klein and Schermer<sup>19</sup> summarizes the psychological impacts of trauma in three categories as follows:

1. PTSD Symptoms: re-experiencing (intrusive recollections, nightmares, when exposed to cues of the event), avoidance (of thoughts, feelings or events related to trauma, diminished interest, detachment from others), and hypersensitivity (irritability, trouble concentrating, startled responses).
2. Changes in the assumptive world: erosion of trust in significant others, survival as crucial goal, feelings of helplessness, shame and guilt, assuming a 'victim' (or perpetrator) role'.
3. Change in internalized objects and the self: helplessness and entrapped dependency, massive use of dissociation, projective identification and splitting, regression to 'primitivized' object relations, imposing of a "false-self", loss of self-cohesion and self-esteem.

## Methods

### Participants

The target of population was victims that hit by landslides in around of Malaysia, there were about 500 respondents that filling of questionnaire. Five of research areas have been selected by the researcher and each location were 100 respondents. We provided detailed information regarding the purpose and the procedures of this study and we excluded the respondents if they refused to take part of this study for prevent uncomfortable situation.

Research Area	Respondents
Bukit Antarabangsa	100
Paya Terubong	100
Hulu Langat	100
Hulu Klang	100
Cameron Highlands	100

### Procedure

Data collection was conducted for three months from September to November 2016, one student assistants were deployed to help collect the necessary data. A self-reported questionnaire was administered,

with the researcher reading all items request by respondents. The participants were then given an opportunity to read the items on their own before filling in the responses, under the guidance of the researcher and assistant. The participants were informed that the questionnaire was not an examination thus were asked to relax and fill in it accordingly.

In the interview, respondent were asked to describe some of their initial and aftermath traumatic responses. Respondents were asked questions regarding:

1. Their immediate feeling as they experienced the first impacts of tragedy whether they felt that they would be killed.
2. Whether they had expected such as sudden disaster
3. Their feelings when they saw the landslides.
4. Whether they received professional help
5. Whether they felt anxious, worried about their safety.

### Sampling

Researcher using two sampling for this research, purposive sampling and snowball sampling. Purposive sampling also known as judgement, selective or subjective sampling where is a sampling technique in which researcher relies on his or her own judgment when choosing members of population to participate in the study. For this study, researchers have selected respondents who had involved landslide and have a symptom of trauma.

Besides, snowball sampling also include in this study, it is may simply a technique for finding research subjects where one subject gives the researcher the name of another subject, who in turn provides the name of a third and so on. For this study, we asked for other participant to suggested people who are was hit by landslides.

### Instruments

This study contained two research instrument: the first one is the Post-Traumatic Checklist,<sup>20</sup> it is to test emotional trauma such as depression, psychological stress, fear, anxiety and others. This instrument uses Civilian version that has 17 items and 6 scale 0 (*not at all*), 1 (*a little bit*), 2 (*moderately*), 3 (*a quite bit*), 4 (*quite a bit*), 5 (*extremely*). The Post-traumatic Grow Inventory that test the positive changes and development of the symptoms of trauma,<sup>21,22</sup> is a widely used questionnaire designed to measure positive change after adverse events. The original questionnaire has 21 items and 6 point scale, 0 (*i did not experience this change as a result of my crisis*), 1 (*i experienced this change to a very small degree as a result of my crisis*), 3 (*i experienced this change to a moderate degree as a result of my crisis*), 4 (*i experienced this change to a great degree of my crisis*), 5 (*i experienced this change to a very degree as a result of my crisis*). The scale appears to have utility in determining how successful individuals, coping with the aftermath of trauma, are in reconstructing or strengthening their perceptions of self, others and the meaning of events.

### Data Analysis

This research will apply one types of software: the Statistical Package for Social Science (SPSS) version 15.0 for windows (SPSS,

Chicago, IL, USA). SPSS will be used for data input, screening, demographic profiling and the descriptive statistics to analyze data in the first place.

## Result and discussion

(Table 1) sociodemographic characteristics are presented in Table 1, of 500 participants who were participated in the study with eligibility criteria. Most (58.6%) were female and 41.4% of male. All the participant is the victim that hit by landslide and most of them were experience by psychological consequences. The majority of participants were head of household (43.8%) and had different level of education. The highest education were high school 44.2% and a few of them had university education and others. Over half (46.2%) of participants were Malay followed by Chinese (26.6%) and Indian (15.6%), the rest of them were Bangladesh, Nepal and Indonesia that include for this study. They are farm workers in Cameron Highlands that also being victims of landslide.

**Table 1** Socio-demographic of the participants (N=500)

Variables	Sample n (%)
<b>Participant status:</b>	
Head of household	219 (43.8)
Wife	150 (30.0)
Young	127 (25.4)
Other	4 (0.8)
<b>Gender:</b>	
Male	207 (41.4)
Female	293 (58.6)
<b>Ethnicity/Race:</b>	
Malay	231 (46.2)
Chinese	133 (26.6)
Indian	78 (15.6)
Bangladesh	35 (7.0)
Nepal	7 (1.4)
Indonesia	16 (3.2)
<b>Age (years):</b>	
Below 20	59 (11.8)
21-39	130 (26.0)
40-60	210 (42.0)
61 and above	101 (20.0)
<b>Level of education:</b>	
University	122 (24.4)
High school	221 (44.2)
Lower secondary school	106 (21.2)
Standard school	40 (8.0)
None	11 (2.2)

Table 2 presented of trauma-related studies that were selected for the five different areas as sample sites due to their historical landslides record. Result of the field survey revealed that Bukit Antarabangsa dominated of number where a total of 82 respondent suffer of trauma after landslide. However, in Paya Terubong were 66 respondent have been suffer from trauma followed by Hulu Langat and Hulu Klang 44 and 53 respondent that experience of trauma after landslide. Majority of the respondent for four sites had an extreme landslides. Cameron Highlands dominated the lowest number of respondent (36 respondent) suffer of trauma after landslide compared to the other four sites. Through the interviews that we are conducted in all five areas found they are suffer badly of trauma and was very surprised when facing of landslide. The one of respondents at Bukit Antarabangsa described how they experienced of landslides and commented:

**Table 2** Trauma-related based on location of study

Location	Trauma-related	
	Have you been suffer of trauma after landslide	Have your family also suffered of trauma after landslide
Location	Yes No	Yes No
Bukit Antarabangsa	82 18	65 35
Paya Terubong	66 34	66 34
Hulu Langat	44 57	30 71
Hulu Klang	53 46	38 61
Cameron Highlands	36 64	0 100
Total	281 219	199 301
	500	500

*"I heard a very loud sound such as blast bombs, and suddenly the earth shook very strongly about 30-40 seconds. After a seconds, all this areas was blackout and I heard voice of screaming all around the places. I'm so panic and can't think anything. It's a bad experience and I can't forget this till I die. At that time, I just pray to Allah for our safety; I could not sleep well for a week because of this incident".*

Researchers also interviewed respondent in Cameron Highlands that consists of foreign workers which also affected by a landslide:

*"This area frequent hit by landslides if we're not guarded well. My friend had a minor injury in the right hand and leg but managed to escape when the landslide hit this areas (Bertam Valley), even the landslides in a small scale, but he's still shocked and traumatized, he's also look distant and didn't much talk as usual. Now, he has quit and returned to his home in Indonesia for the treatment therapy".*

The next question we addressed was whether respondent's family also have been trauma after the landslide. Result show that a large majority of 65 and 66 family of the surveyed households from Bukit Antarabangsa and Paya Terubong that also suffer from trauma. The number of households for both Hulu Klang and Hulu Langat 30 and 38

respondent. Then, no family who were living in Cameron Highlands that suffer from trauma because majority of respondent are migrant workers and they do not brings their families.

From results of the field survey, researcher have tried to explained though the family did not suffer any injury or trauma, but they were pleasantly surprised at the events that have never seen before especially for children and elderly. Some of respondents suffered by trauma as a result of seeing the incident for the first time and take a long period to recover. As a result caused trouble fall asleep and keep remembering that events. We present the factors associated with Post-Traumatic Stress disorder in Table 3. All the factors has a 17 items from Post-Traumatic Checklist,<sup>23</sup> it is to test emotional trauma such as depression, psychological stress, fear, anxiety and others. It is contains a likert scale as shown in Table 3. What can be summarized on that table, for the extremely scale for symptom of trauma show that majority 8.8% had repeated and disturbing memories because of landslide events. It is proven when researcher who asked trauma patients to record their reexperiencing, they found that many of the recorded distressing dreams were related to trauma, and a minority were experienced as replicas of the trauma.<sup>23</sup> Yet nightmares cannot literally replay the sensory aspects of the traumatic experience.

Then, results of the field study also revealed the highest percentage symptom of trauma 14.0 % trouble falling and staying asleep. This situation for many people with PTSD that might experience some difficulty sleeping, wake up frequently during the night We interviewed respondents who had been involved in the landslide and suffer from trauma, they commented:

*"A lot of houses destroyed in front of my house including our neighbourhood, I was in my house when the incident happened, though there is no injury to me and my family but i can't forget that. After the incident, its difficult to fall asleep like stressful experience were happening again. I often wake up early because of nightmare".*

The other symptom were avoid activities because of stressful experience is about 12.0%. This can relate when person does not forget about the past and they are often in a state of fear, worried because of the situation that they experiencing. Cognition and mood symptoms can begin or worse after the traumatic event, but are not due to injury or substance use. These symptoms can make the person feel alienated or detached from friends or family members. Hence, they avoidance of places, people or things that are a reminder of the trauma. The respondent must felt so stress and tried avoidance of thoughts or feelings, people, places or activities may not be successful in reducing distress. Then tried to avoid activities to be meaningful expressions of the symptoms. Result shows 11.6% had trouble remembering important parts of a stressful experience from the past because of trauma. Lepore et al.,<sup>24</sup> arousal symptoms are usually constant, instead of being triggered by things that remind one of the traumatic events. These symptoms can make the person feel stressed and angry. They may make it hard to do daily tasks such as sleeping, eating, concentrating and remembering importance things. This things referred to as 'psychogenic amnesia', this is not merely that the person could not keep track of everything that happened, but rather that the individual is aware of important details that cannot be remembered; that is, there are gaps and holes in the story as it is remembered and told<sup>25</sup> (Table 3).

**Table 3** Symptom of trauma

Response	Not at all (%)	A little bit (%)	Moderately (%)	Quite a bit (%)	Extremely (%)
Repeated, disturbing memories, thought	42.4	8.6	29	11.2	8.8
Repeated, disturbing dreams of a stressful experience from the past?	51.6	7.2	7.4	15	8.8
Suddenly acting or feeling as if a stressful experience were happening again.	43.2	7.6	24.2	19.2	5.8
Feeling very upset when something reminded you of a stressful experience from the past?	46.8	9.6	11.4	23.6	8.6
Having physical reactions such as heartpounding, trouble breathing or sweating when something reminded you of a stressful experience from the past?	56.2	5.6	15	14	9.2
Avoid thinking about or talking about stressful experience from the past or avoid having feelings related to it?	49	7.4	16.8	15.4	11
Avoid activities or situations because they remind you of a stressful experience from the past?	50.2	6.8	18.2	12.8	12
Trouble remembering important parts of a stressful experience from the past?	49.4	8.6	15	15.4	11.6
Loss of interest in things that used to enjoy.	55.8	4.8	13.2	21.6	4.6
Feeling distant or cut off from the other people?	57.6	5	11.6	14.8	11
Feeling emotionally numb or being unable to have loving feelings for those close to you?	56.6	6.2	14.6	13.6	9
Trouble falling or staying asleep?	50	9.6	18	8.4	14
Feeling irritable or having angry outburst?	56.4	8.8	11.6	15.8	7.4
Having difficulty concentrating?	54	7.4	15	15.2	8.4
Being "super alert" or watchful on guard?	51.4	5.8	14.2	25.8	7.2
Feeling jumpy or easily startled?	47	5.8	14.2	25.8	7.2
Feeling as if your future will somehow be cut short?	58.6	5	7.8	21.6	7

Table 4 presented the rehabilitation of trauma that contain two categories, recovering of trauma and have been life return as a normal after traumatic events. This two question were asked for respondents to know the level of post-traumatic growth for each victims that faces of landslides. By past research, a majority of the people exposed to trauma report that they have experienced some kind of benefit derived not from the trauma itself but from the coping process linked to the adverse experiences, which has been called benefit findings, positive life changes, stress-related growth, or post-traumatic growth (Helgeson, Reynolds & Tomich, 2006; Linley & Joseph 2004). There has five different selected areas of studies, results show that a large

majority of 81 (16.2%) and 67 (13.4%) of the surveyed from Bukit Antrabangsa and Paya Terubong were recovering of trauma. Where as in Hulu Klang and Hulu Langat were 48 (9.6%) and (8.8%). The number of recovering of trauma in Cameron Highlands 36 (7.2%) was low for all four sites. That prove there is growing body of evidence testifying to the positive psychological changes that can result from people's struggles with stressful and traumatic experiences. It is hard to recovering from trauma but if they are strong enough to fights over that. We interviews some of trauma respondents that have been recovering of trauma:

**Table 4** Rehabilitation of trauma

Location	Recovering of trauma			Total	Life returns to normal after trauma			Total
	Yes (%)	No (%)	Not related (%)		Yes (%)	No (%)	Not related (%)	
	Bukit Antarabangsa	81	2		17	100	81	
Paya Terubong	67	0	33	100	68	0	32	100
Hulu Langat	44	0	56	100	42	1	57	100
Hulu Klang	48	3	49	100	52	5	43	100
Cameron Highland	36	0	64	100	38	0	62	100
Total	276	5	219	500	281	6	213	500

*“Its been a long day i just sat in my basement, didnt do anything, didnt contact anyone. That incident probably had the most positive effects on my life. It really took that incident to really wake me up and say, this is what you're gonna do for the rest of your life? You should know you're gonna go to college, gonna get a good grades and make a lot of friends. I think this life is so precious if you're really into it, 'move on' its the wonderful words that can i say”*

There is 1 (0.2%) and 3 (0.6%) do not recovering of trauma but it is still with the small amount. All the number of five selected areas of location were choose for not related recovering trauma. The number of respondents in Bukit Antarabangsa were chosen not relates 17, Paya Terubong 67, Hulu Langat 44, Hulu Klang 48 and Cameron Highland 36 respondents. For the not related variables, some of them might be not include in trauma symptoms or any traumatic growth. Table 4 were presented respondents who were back to normal after the traumatic events, it is interesting to note that 16.2% (81) and 13.6% (68) from Bukit Antarabangsa and Paya Terubong. However, the percentage of the other respondents in three sites also show the positive growth of traumatic. Hulu Klang 8.4% (42), for Hulu Langat 10.4% (52) and Cameron Highlands 7.6% (38). The percentage for respondents that do not recovering and still trauma in a way but in a small amount, the percentage for both sites were 0.2% (1) in Hulu Langat and 1.00% (5) in Hulu Klang. The percentages of respondents who were answer not related in Bukit Antarabangsa 19, Hulu Langat 57, Hulu Klang 43, Paya Terubong 32 and the last one is Cameron Highlands 63 respondent. In summary, researchers found that trauma also provides individuals with an opportunity to revise their life narratives in positives ways. In addition, redefine their identities and social roles<sup>26,27</sup> develop more realistic and less shatter-prone schemas about the world and experience personal transformation and Post Traumatic Growth.<sup>27</sup>

Table 5 represented the domains of post-traumatic growth were identified from the data. There is five domains PTG as shown as Table 5, which can be measured through the dimensions of increased closeness in relationships, new found possibilities in life, discovery of personal strength, spritual change, and a greater appreciation of life.<sup>20</sup> The number of respondents who were new possibilities 125 (25%), in the original PTG model 'new possibilities' is a separate domain, representing individual's identification of new ways for achievement.<sup>20</sup>

**Table 5** Domains of Post-traumatic Growth

Categories	Subcategories	Number of respondents
Domains of Post-Traumatic Growth	Appreciation of life	119
	New possibilities	107
	Personal strength	61
	Spiritual change	47
	Relationships.	166
	Total	500

Results of the field survey revealed that spritual change is about 47 (23.8%). There is respondents felt that her sense of spritual awareness had deepend.

*“Being for this condition has increased my previous belief that all live intendended to be here. No life are mistakes”. I keep up praying to God for strengthen of life”*

*“Every morning I wake up and I just say 'Thank You, Allah'. I'm awake, I can see, I can walk, I can talk. I view myself as a part something bigger, like Allah has a plan for everybody and whatever His plan for me is, it means that i had to go through everything that I went through to be the person that I am now”.*

Praying as a form of coping positively associated with PTG. McMillen and Fisher<sup>29</sup> claimed that increased spritualty following a traumatic event could be understood by the individual as because of this event, “I became: 1) more religious, 2) more spritual, 3) more faithful in God”. Then, studied report that spritualty could predict positive psychological growth following the traumatic experience.<sup>30</sup>

The percentage of personal strength were 12.2% (61). Personal strength conveys a sense of survival through the negative consequences of an event and reflects the notion that the event was a trigger for newfound advantage.<sup>31</sup> Becoming less judgmental, less selfish, more compassionate, more caring, more patient and more mindful of individual diffrences. However, the number of respondent appreciate of life were 119 (23.8%), it was characterized by an increased gratitude for life. In these cases there was something appreciation for the value of life that make respondents felt motivational. For the relationship the highest of all factors 166 (33.2%) respondents. Improving relationships and relating to others experiencing adversity were identified as two themes in this sub-category. Improved relationships included greater marital or family unity and closer relationships with friends, neighbours or related others. Relating to others experiencing adversity to an increased sense of compassion for other persons who suffer.<sup>32</sup> Respondent described:

*“There've been a couple times where I felt myself start to get negative and start to slide*

*back. To make sure it doesn't happen again, I will start talking. I will openly address*

*the issues that I have. I learned that I need to have people in my life, friends that I can*

*talk to, friends that have my best interest in mind”.*

In summary, much of human distress is a reaction to extreme stress, but not everyone experiencing such events becomes depressed. There is, then, something about the fit between the the event and the person that leads to depression. In a similar way there is another class of more extreme events, which depending on particular features of the individual can lead to Post-traumatic stress Disorder (PTSD). But, we are realized recovering following extreme disaster such as landslide is complex, involving physical and psychological challenges. Despite the trauma of the accident and impact of the disaster, traumatized victims can go on to experience growth and exceed pre-trauma levels of personal functioning. It seems that the process of growth emerges from distress.

## Conclusion

It is important to emphasize that disasters cover a range of experiences. Natural disasters possibly are able to be dismissed as acts of God. But, Smith and North<sup>33</sup> opinion that technological and human made disasters are likely to be more traumatic than natural disasters as they provoke a greater sense of being the deliberate victim of one's fellow human beings. Disasters such as landslides not just destroyed significant number of casualties, property, loss of life and

other intangible losses but also have been a terrible experience with psychological consequences. Victims of disasters experience life-threatening or unexpected events and are often displaced. As a result, these experiences cause both physical and mental trauma. PTSD can cause someone to lose enthusiasm for life, depression, feeling distant, emotionally and others but the seriousness of traumatized victims that bounce back from depression is totally great.

In summary, PTSD has been linked to incomplete narrative where the memory of the traumatic event is fragmented, the chronological sequence of events distorted and the facts of events can be unclear.<sup>34</sup> The physiologic changes in the brain associated with PTSD can render survivors speechless where they literally cannot produce the words to describe their feelings. Although negative psychological outcomes have been mainly studied in trauma research, the literature has also reported that traumatized persons can resolve their trauma, strengthen their coping skills regarding potential traumatic stressors or conflicts and develop positive psychological attributes such as posttraumatic growth and resilience. Hence, PTG among trauma victims also is an interesting topic to discuss, their determination to recover from the traumatized is a positive. From findings of this study we can conclude, there are thought to be five domain PTG that influenced trauma persons to be positive growth, appreciation of life, new possibilities, personal strength (greater sense of resilience or strength), spiritual change (spiritual belief) and relationships (valuing friends or family more, increased compassion towards others). Not only PTG associated with better outcomes in terms of mental health, but it has been established as an outcome in itself rather than mere reflection of trauma. There are limitations to this study that should be considered when interpreting the findings. The mechanism of how PTG takes place and the contribution of each factor should continue to be explored in order to develop a comprehensive understanding of many aspects.<sup>35–38</sup>

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## Conflicts of interest

None.

## References

- Parker DJ, Islam N, Chan NW. Chapter 3: Reducing Vulnerability Following Flood Disaster: Issues and Practices. In: Awotona, A, editor. *Reconstruction After Disaster*. London: Avebury;1997:23–44.
- Bambang Istijono. Landslide hazard of Maninjau area. *International Journal of Disaster Resilience in the Built Environment*. 2016;7(3):302–312.
- National Slope Master Plan 2009–2023. *Public Works Department*. 2009;1–9.
- American Psychological Association. *Diagnostic and Statistical Manual of Mental Disorders III*. Washington, DC: American Psychiatric Association;1980.
- Cherry KE. *Lifespan perspectives on natural disasters: Coping with Katrina, Rita and other storms*. New York, NY: Springer; 2009: 336.
- Davidson JR, Hughes T, Blazer D, et al. Posttraumatic stress disorder in the community: an epidemiological study. *Psychol Med*. 1991;2(3):713–721.
- Rauch SL, Van Der Kolk B, Fisler HE, et al. A symptom provocation study of posttraumatic stress disorder using positron emission tomography and script-driven imagery. *Arch Gen Psychiatry*. 1996;53(5):380–38.
- Calhoun LG, Tedeschi RG. Positive Aspects of Critical Life Problems: Recollections of Grief. *Omega*. 1990;20(4):265–272.
- Schwartzberg SS, Janoff-Bulman R. Grief and The Search for Meaning: Exploring The Assumptive Worlds of Bereaved College Students. *Journal of Social and Clinical Psychology*.1991;10(3):270–288.
- Schwartzberg SS. Vitality and Growth in HIV-Infected Gay men. *Social Science and Medicine*, 1994;38(4):593–602.
- Affleck G, Tennen H, Croog S. Causal Attributions, Perceived Benefits and Morbidity After Heart Attack and Protection From Future Harm. *American Journal of Mental Deficiency*. 1987;89:653–656.
- Thompson SC. Finding Positive meaning in a Stressful Event and Coping. *Basic and Applied Social Psychology*. 1985;6(4): 279–295.
- Sledge WH, Boydston JA, Rabe AJ. Self-concept Changes Related to War Captivity. *Archives of General Psychiatry*. 1980;37(4):430–443.
- Carver CS. Resilience and Thriving: Issues Models, and Linkages. *Journal of Social Issues*. 1998;54(2):245–266.
- Lin Y, Xu J, Liu DD. The relationship between post-traumatic stress disorder and post traumatic growth: Gender differences PTG and PTSD subgroups. *Soc Psychiatry Psychiatr Epidemiol*. 2014;49(12):1903–1910.
- Thomas LE, DiGiulio RC, Sheehan NW. Identifying Loss And Psychological Crisis in Widowhood. *Int J Aging Hum Dev*. 1991;26(3):279–295.
- Collins RL, Taylor SE, Skokan LA (1990) A Better World or a Shattered Vision? Changes in Life Perspectives Following Victimization. *Social Cognition*. 1990;8(3):263–285.
- Weimberg H, Nuttman-Swartz O, Gilmore M. Trauma groups: An overview. *Group Analysis*. 2005;38(2):187–202.
- Klein R, Schermer V. *Group Psychotherapy for Psychological Trauma*. New York: Guilford Press;2000: 1–355.
- Weathers FW, Huska JA, Keane TM. PCL-C for DSM-IV. Boston: *National Center for PTSD Behavioral Science Division*. 1991.
- Tedeschi RG, Calhoun LG. The posttraumatic growth inventory: Measuring the positive legacy of trauma. *J Trauma Stress* 1996;9:455–472.
- Tedeschi RG, Calhoun LG. The posttraumatic growth inventory: measuring the positive legacy of trauma. *J Trauma Stress*. 1996;9(3):455–471.
- Esposito K, Benitez A, Barza L, et al. Evaluation of Dream Content in Combat relate PTSD. *Journal of Traumatic Stress*. 1999; 12(4):681–687.
- Lepore SJ, Ragan JD, Jones S. Talking facilitates cognitive-emotional processes of adaptation to an acute stressor. *J Pers Soc Psychol*. 2000;78(3):499–509.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, third edition revised*. Washington, DC: American Psychiatric Association;1986.
- Hagman G. Beyond deathtaxis: Toward a new psychoanalytic understanding and treatment of mourning In: Neimeyer RA, editor. *Meaning Reconstruction and The experience of Loss*. Washington. DC: American Psychological Association;2001:13–31.

27. Neimeyer RA. The language of loss: grief therapy as a process of meaning reconstruction. In: Neimeyer RA, editor. *Meaning reconstruction and the experience of loss*. Washington, DC: American Psychological Association;2001:261–292.
28. Tedeschi RG, Park CL, Calhoun LG. Post-traumatic growth: Conceptual issues. In: Tedeschi RG, Park CL, Calhoun LG. editors. *Posttraumatic Growth: Positive Changes in the Aftermath of Crisis*. Mahwah, N.J.: Lawrence Erlbaum Associates;1998:1–22.
29. McMillen JC, Fisher RH. The perceived benefit scales: Measuring perceived positive life changes after negative events. *Social Work Research*. 1998;22(3):173–187.
30. Swickert R, Hittner J. Social support coping mediates the relationship between gender and posttraumatic growth. *Journal of Health Psychology*. 2009;14(3):387–393.
31. Shakespeare-Finch J, Copping A. A grounded theory approach to understanding cultural differences in posttraumatic growth. *Journal of Loss & Trauma*. 2006;11(5):355–371.
32. Calhoun LG, Tedeschi RG. Foundations of Post-traumatic growth: An expanded framework. In: Calhoun LG, Tedeschi RG, editors, *Handbook of Posttraumatic Growth: Research and Practise*. Mahwah, N.J: Lawrence Erlbaum Associates;2006:3–23.
33. Smith EM, North CS. Posttraumatic Stress Disorder in Natural Disaster and Technological Accidents. In: Wilson JP, Raphael B. editors. *International handbook of traumatic stress syndromes*. New York: Plenum Press;1993: 1012.
34. Van Der Kolk B. *The body keeps the Score: brain, mind, and body in the healing of trauma*. Penguin;2014:464.
35. Calhoun LG, Tedeschi RG. *Handbook of Posttraumatic Growth: Research and Practice*. Mahwah, NJ: Lawrence Erlbaum Associates; 2006.
36. Foa EB, Stein DJ, McFarlane AC. Symptomatology and psychopathology of mental health problems after disaster. *J Clin Psychiatry*. 2006;67(Suppl 2):1525.
37. Janoff-Bulman R. *Shattered Assumptions*. New York: The Free Press; 1992.
38. Richard GT, Lawrence GC. The Post-Traumatic Growth Inventory: Measuring The Positive Legacy of Trauma. *Journal of Traumatic Stress*. 1996;9(3):455–471.