

## Family functioning and post-traumatic growth among disaster survivors: The mediation role of hope

Intan Masruroh Setiawan, Diana Setiyawati

Faculty of Psychology, Gadjah Mada University, Yogyakarta, Indonesia  
Corresponding author: intanmasrurohsetiawan@mail.ugm.ac.id

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### ABSTRACT

Post-traumatic growth enables disaster survivors to continue functioning in their post-disaster lives optimally, and enables them to be better equipped to face difficulties in the future. This research aims to test the role of hope in mediating the relationship between family functioning and post-traumatic growth in survivors of the Mount Semeru eruption disaster. The participants in this research were 180 people aged 18-60 years who were survivors of the Mount Semeru eruption disaster in 2021. The instruments used were the Post-traumatic Growth Inventory-Expanded (PTGI-X), Family Adaptability and Cohesion Evaluation Scale IV (FACES-IV), and Adult Hope Scale (AHS). Simple mediation analysis was used to analyze the data. The results show that hope partially mediates the relationship between family functioning and post-traumatic growth in survivors of the Mount Semeru eruption disaster. It means that family functioning can influence post-traumatic growth directly and indirectly through hope as a mediator. This finding can provide input for stakeholders regarding the development of holistic interventions for disaster survivors, both at the individual level related to their hopes and at the relational level related to their family functioning.

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### Introduction

Indonesia is one of the countries prone to disasters. One of the disasters that often occurs in Indonesia is volcanic eruptions. This is due to Indonesia's geographical location in the Ring of Fire or the most active tectonic plate convergence zone in the world. One of the major impact volcanic eruption disasters is the occurrence of pyroclastic flows from Mount Semeru in Lumajang Regency, East Java Province, on December 4, 2021. The eruption of Mount Semeru has resulted in 61 fatalities, 4,423 evacuees, 1,107 affected houses, and dozens of damaged public facilities ([BNPB, 2022](#); [BPBD Kabupaten Lumajang, 2021](#)). Additionally, the eruption has also impacted the agriculture and livestock sectors, which are the main livelihoods of the people around Mount Semeru. Furthermore, a total of 1.951 households of Mount Semeru eruption survivors were relocated to permanent housing due to their residences being located in eruption-prone areas ([BPBD Kabupaten Lumajang, 2021](#)). This has caused the survivors to adapt to a new environment, including seeking alternative sources of income to sustain their livelihoods.

The eruption of Mount Semeru is a traumatic event for its survivors. Traumatic events are specific occurrences characterized by a strong negative attitude, causing distress or disruption in individuals ([Dell'osso et al., 2022](#)). In this case, experiencing a natural disaster firsthand is one of the traumatic experiences because the adverse events related to natural disasters are beyond the ability of individuals and communities to cope with ([Hackbarth et al., 2012](#)). Furthermore, the physical losses, material possessions, and the necessity for relocation contribute to the cumulative exposure of traumatic events experienced by survivors, accumulative from several adverse events simultaneously over time. This is consistent with several previous studies stating that post-disaster relocation can be a traumatic experience and trigger additional stress for survivors ([Fussell & Lowe, 2014](#); [Kadri et al., 2022](#); [Uscher-Pines & Student, 2009](#)).

As a traumatic event, the eruption of Mount Semeru can have negative impacts on the mental well-being of its survivors. The various pressures and sudden environmental changes caused by the disaster can lead to various mental health issues or psychological distress in survivors, such as anxiety and depression ([Dhillon & Sasidharan, 2021](#); [Gissurardóttir et al., 2019](#); [Kokai et al., 2004](#); [Uscher-Pines & Student, 2009](#)). Eruption disaster survivors also often experience the symptoms of posttraumatic stress disorder, such as feeling sad as if reliving the eruption event, easily remembering the eruption event even though they do not want to remember it, and feeling anxious when the mount experiences increased volcanic activity ([Ernawati et al., 2020](#)). However, survivors can also experience positive changes after experiencing a disaster, such as becoming more efficient in managing and utilizing time with family and having stronger beliefs in the power of God ([Khatimah, 2022](#)). These positive changes are commonly referred to as post-traumatic growth.

Post-traumatic growth is defined as positive psychological changes experienced by individuals after facing traumatic events, such as natural disasters ([Tedeschi & Calhoun, 2004](#); [Joseph & Linley, 2006](#)). Post-traumatic growth refers to a transformative process that allows individuals to develop a more positive self-concept, redefine goals, have deeper interpersonal relationships, cultivate a greater appreciation for life, and have a stronger spiritual life ([Calhoun & Tedeschi, 2006](#)). In this regard, post-traumatic growth is a condition in which individuals exhibit higher levels of functioning than before experiencing a traumatic event. In the context of disasters, post-traumatic growth is important to study because it explains the positive self-development of individuals as a result of their struggle to adapt and cope with the difficulties arising from disasters ([Graziano et al., 2023](#); [Malhotra & Chebiyyam, 2016](#)).

A meta-analysis study of 26 studies conducted by Xiaoli et al. ([2019](#)) found that approximately 52.58% of individuals have moderate to high levels of post-traumatic growth after traumatic experiences. This is consistent with Malhotra dan Chebiyyam ([2016](#)) who explains that 40-70% of survivors experience positive impacts from the trauma they have experienced. In the context of natural disasters, several studies have found that individuals can experience post-traumatic growth after experiencing disasters such as fires, tornadoes, tsunamis, and earthquakes ([Felix et al., 2015](#); [Sigveland et al., 2015](#); [Yuan et al., 2021](#); [Zhang et al., 2020](#)). In this regard, having a new life path is considered a key point in post-traumatic growth among disaster survivors, such as improving the quality of relationships with others and engaging in better life activities ([Peters et al., 2021](#); [Graziano et al., 2023](#)). Additionally, Uscher-Pines and Student ([2009](#)) found that survivors who experience post-disaster relocation also feel a stronger sense of community bonding and receive more support and assistance related to daily activities.

Post-traumatic growth can have positive implications for survivors in their post-disaster lives. In this regard, post-traumatic growth is correlated with lower levels of

depression ([Helgeson et al., 2006](#)) and better quality of life ([Kyutoku et al., 2021](#)). When individuals develop meaning and create new and valuable perspectives regarding their lives, they tend to have better psychological well-being ([Joseph, 2012](#)). In navigating post-disaster life, post-traumatic growth also serves as a resource for survivors to view the world in a more balanced way after the disaster, where positive and negative experiences are integrated ([Siqueland et al., 2015](#)). This allows survivors to continue functioning in their daily activities and even encourages their abilities and capacities to move towards improvement ([Calhoun & Tedeschi, 2006](#)). Furthermore, post-traumatic growth enables survivors to be better equipped to face difficulties in the future ([Tedeschi et al., 2018](#)).

Given the benefits of post-traumatic growth for survivors in navigating their post-disaster lives, it is important to understand the factors that affect this growth. One external factor that plays a role is the family, as the family is part of the microsystem and the closest source of support to the individual ([Bronfenbrenner & Morris, 2006](#)). In this regard, family members tend to share experiences and provide support to each other when they encounter difficulties ([Tingvold et al., 2012](#)). The presence of family support during crises is one manifestation of family functioning ([Feeney & Collins, 2015](#)). Family functioning is the ability of a family to fulfill its basic functions effectively, which include providing an environment for all family members to develop optimally, both physically, psychologically, and socially ([Dai & Wang, 2015](#); [Epstein et al., 1978](#)). Lei and Kantor ([2021](#)) stated that family functioning encompasses how family members interact, react, and treat each other. In crisis situations such as disasters, well-functioning families will continue to strive to meet the needs of their family members ([Li et al., 2021](#)). This can be proven through interactions such as family support as part of their efforts to adapt to arising difficulties. Additionally, the balance of family cohesion and flexibility supported by effective communication among family members also indicates a well-functioning family ([Olson, 2000](#); [Olson et al., 1989](#)).

Well-functioning families can be a driving factor for post-traumatic growth in individuals. This is because of their role as a source of support that facilitates the affective and cognitive processes within individuals to reconstruct a new belief system that can integrate trauma-related information toward growth ([Joseph & Linley, 2006](#); [Sun et al., 2023](#); [Tedeschi & Calhoun, 2004](#)). In well-functioning families, there is also substantial interaction that can bring about positive changes in individuals after experiencing difficulties or traumatic events ([Mancini, 2019](#)). Furthermore, well-functioning families can alleviate stress and depression in individuals and encourage them to actively use emotion regulation strategies, which ultimately can create more positive emotional experiences ([Feng et al., 2022](#)). Moreover, Hullmann et al. ([2014](#)) also emphasize the importance of examining family functioning as one of the factors that can contribute to post-traumatic growth.

Previous studies also indicate a positive correlation between family functioning and post-traumatic growth. Functioning exhibited through family flexibility and communication has been shown to have a significant correlation with post-traumatic growth in survivors of the tsunami disaster ([Augustine, 2014](#)). Qin et al. ([2021](#)) also found that more effective problem-solving strategies within families are positively associated with post-traumatic growth in parents of children with autism spectrum disorder. Furthermore, Teixeira and Pereira ([2013](#)) in their study on cancer survivors found that family cohesion, flexibility, and communication correlate positively with post-traumatic growth. This is because families capable of changing roles and rules within the family system in a healthy manner are likely to demonstrate better overall health functioning even in difficult situations.

Based on several studies, it can be understood that family functioning and post-traumatic growth have a positive correlation. However, the internal mechanisms of the relationship between these two variables have not been extensively researched, especially

among natural disaster survivors. This is also in line with the findings of Khatimah (2022) that there might be other variables serving as mediators in the relationship between family functioning and post-traumatic growth. Regarding this matter, several other factors also correlate significantly with post-traumatic growth. Previous researchers have explained that internal factors can serve as predictors of post-traumatic growth in individuals. One important internal factor that has a significant positive correlation with post-traumatic growth is hope (Confino et al., 2023; Wang et al., 2021; Zhou & Wu, 2018).

Snyder et al. (1991, 2003) explained that hope is a cognitive set consisting of an individual's beliefs regarding their capacity to determine goals, develop strategies to achieve those goals (pathways thinking) and maintain motivation to utilize those strategies (agency thinking). Hope serves as one of the psychological resources that can affect post-traumatic growth. In crisis situations, hope plays a protective role, enabling individuals to quickly rise and take further steps to rebuild their lives (Counted et al., 2022; Snyder et al., 2003), while also serving as a fundamental resource to support growth (Colla et al., 2022). Furthermore, when facing challenges in the process of achieving their goals, individuals with high levels of hope tend to have positive self-talk, persevere in overcoming setbacks, and view setbacks as opportunities for growth (Pan et al., 2021; Snyder, 2002).

Hullmann et al. (2014) explain that hope can affect an individual's reactions to events in their lives. When facing difficulties or challenges, such as in disaster situations, individuals with high levels of hope will continue to seek strategies to achieve their goals or find alternative goals as the best decision. Conversely, individuals with low levels of hope are more likely to give up on achieving their goals when faced with difficult situations, which can lead to maladaptive psychological adjustment. Scheier and Carver (2001) also state that hope can redirect an individual's focus from negative events or emotional states. In the context of disasters, hope can assist survivors in adapting and overcoming the challenges they face to move forward with their lives post-disaster. Additionally, having hope also aids individuals in employing active coping strategies to face traumatic events and reconstruct their understanding of themselves, others, and the surrounding world, ultimately leading to growth (Germann et al., 2015; Zhou & Wu, 2018).

Several studies also indicate that hope can predict post-traumatic growth. Zhou and Wu (2018) in their research on adolescent earthquake survivors found that hope can have a direct and positive impact on post-traumatic growth, as well as serve as a driver of post-traumatic growth through cognitive acceptance and reassessment. Furthermore, in war refugees, hope as a resource for adaptation has also been shown to correlate positively with post-traumatic growth (Ai et al., 2007). Moreover, hope has been found to act as a mediator of post-traumatic growth in COVID-19 patients (Laslo-Roth et al., 2022) and earthquake survivors (Zhou et al., 2018). In this regard, individuals' perception of their ability to achieve positive outcomes as their goals can serve as a significant motivation for individuals to strive to overcome the impacts of the traumatic events they face, and even further foster growth.

Individuals' hopefulness can also be affected by their relationships with their closest ones, such as family. Snyder (2002) explains that individuals can develop attachments through quality interactions within their families. This attachment is necessary for individuals to develop ways of strategizing and taking action to achieve goals (Shorey et al., 2003). Additionally, individuals can further develop a positive and hopeful personality through interactions within a well-functioning family (Beavers & Hampson, 2000; Feldman & Snyder, 2005). In disaster situations, individuals within families that function well, characterized by a balance of cohesion and flexibility, also tend to maintain or develop hope to continue their lives. This is consistent with research findings that individuals have higher levels of hope when they have high levels of family cohesion (Feldman et al., 2018).

Additionally, when individuals perceive higher levels of family functioning, they also tend to have higher levels of hope ([Peng et al., 2023](#); [Zarei & Fooladvand, 2022](#)).

This study adopts the theoretical framework of the post-traumatic growth model ([Tedeschi & Calhoun, 2004](#)) and the thriving through relationship model ([Feeney & Collins, 2015](#)). The post-traumatic growth model emphasizes the cognitive-emotional processes triggered by exposure to traumatic or highly stressful events. In this regard, constructive cognitive processes are assumed to play a key role in post-traumatic growth, which can also be affected by external factors ([Tedeschi & Calhoun, 2004](#)). Meanwhile, the thriving through relationship model ([Feeney & Collins, 2015](#)) emphasizes the importance of close relationships that function well (such as within the family) as fundamental to thriving because they enable individuals to successfully navigate difficulties. Feeney and Collins ([2015](#)) explain that close others such as family can serve as a source of strength (SOS) that protects and empowers individuals in challenging circumstances, helping them to grow, develop, and achieve well-being. In this regard, family functioning acting as an SOS can reassure the development of individuals' internal resources, such as hope, which ultimately can lead to growth after experiencing traumatic events.

Based on the explanation above, it can be understood that post-traumatic growth is crucial for survivors of the Mount Semeru eruption to navigate their lives after the disaster. In this context, family functioning can be one of the factors affecting this post-traumatic growth, with hope serving as a mediating variable. Research on the mechanism of the relationship between post-traumatic growth, family functioning, and hope has been limited, especially in the context of disaster survivors in Indonesia. Previous studies on post-traumatic growth have focused on personality traits ([Karanci et al., 2012](#); [Owens, 2016](#); [Mattson et al., 2018](#)), coping strategies ([Henson et al., 2021](#); [Knauer et al., 2022](#)), and social support ([Ning et al., 2023](#); [Sun et al., 2023](#)) in fostering post-traumatic growth. Additionally, there is still a need for exploration regarding cognitive mechanisms ([Luu, 2022](#); [Tedeschi & Calhoun, 2018](#)), as well as the relationship between external and internal factors in individuals that can encourage post-traumatic growth ([Augustine, 2014](#); [Feeney & Collins, 2015](#)).

Therefore, this study aims to investigate the role of hope in mediating the relationship between family functioning and post-traumatic growth among survivors of the Mount Semeru eruption disaster. The hypothesis of this study is that hope mediates the relationship between family functioning and post-traumatic growth. Through well-functioning families, it is hoped that survivors can adapt to existing difficulties and develop hope in their post-disaster lives. With the hope they possess, survivors can envision a positive future, leading to the development of post-traumatic growth. This research is expected to provide initial input for the development of intervention programs related to post-traumatic growth, which is still lacking among disaster survivors in Indonesia. Additionally, theoretically, this research is also expected to contribute to the scientific literature on family functioning, hope, and post-traumatic growth among disaster survivors in Indonesia.

## Method

### *Participants*

The participants in this study were 180 survivors of the 2021 Mount Semeru eruption who were residing in permanent relocation shelters. These shelters are located in Sumbermujur Village, Candipuro District, Lumajang Regency, East Java Province. Participants were selected through purposive sampling, which involves sampling based on specific characteristics relevant to the research objectives ([Gravetter & Forzano, 2020](#)). The criteria

for participants in this study are a) Survivors of the 2021 Mount Semeru volcanic eruption; b) Aged between 18 and 60 years old; and c) Directly experienced the eruption event (being at the impacted location during the eruption and/or witnessing/hearing the eruption of Mount Semeru).

**Table 1**

*Participants Demographic Data (n=180)*

	Demographic	Frequency	Percentage
Gender	Male	74	41.1 %
	Female	106	58.9 %
Age	18 - 29 Years	39	21.7 %
	30 - 45 Years	95	52.8 %
	46 - 60 Years	46	25.6 %
Last Education	Not Graduated Elementary School	15	8.3 %
	Elementary School	104	57.8 %
	Junior High School	28	15.6 %
	High School	25	13.9 %
	Diploma	1	0.6 %
	Bachelor's Degree	3	1.7 %
	Other	4	2.2 %
Occupation	Sand Miner	7	3.9 %
	Farmer	48	26.7 %
	Merchant	20	11.1 %
	Housewife	54	30 %
	Unemployed	20	11.1 %
	Others	31	17.2 %
Job Change	Experienced	53	29.4 %
	Not Experienced	127	70.6 %
Marital Status	Single	10	5.6 %
	Married (No Children)	4	2.2 %
	Married (With Children)	152	84.4 %
	Previously Married	14	7.8 %

### ***Procedures***

Data collection was conducted from January 29th to February 1st, 2024, after obtaining Ethical Clearance approval from the Research Ethics Committee of the Faculty of Psychology, Universitas Gadjah Mada, and permission from the Village Government of Sumbermujur, Candipuro District, Lumajang Regency, East Java Province. Data collection was done offline at the Sumbermujur Permanent Residence by requesting participants' willingness to complete the questionnaire after obtaining their consent to participate in the study through informed consent.

### ***Instruments***

**Post-traumatic growth.** To measure the post-traumatic growth experienced by participants, the researchers used the Post-traumatic Growth Inventory-Expanded (PTGI-X) scale developed by Tedeschi et al. (2017) and adapted by Rahmaningsih (2019). The scale was

modified by the researchers to fit the research context by changing the main instruction ("after experiencing the eruption disaster"). The PTGI-X scale consists of 25 items covering five dimensions: personal strength, new possibilities, relating to others, appreciation of life, and spiritual and existential change. The PTGI-X scale had response options ranging from 0 (I did not experience any change in this regard) to 5 (I experienced a very large change in this regard). Based on the pilot test conducted, this scale had a reliability coefficient alpha ( $\alpha$ ) of 0.94, with the total item correlation values ranging from 0.41 to 0.75, indicating that all items had good discriminant power.

**Family Functioning.** The Family Adaptability and Cohesion Evaluation Scale IV (FACES-IV) was used in this study based on The Circumplex Model of Marital and Family Systems by Olson (2000). The FACES-IV scale has been adapted into Indonesian by Yeyentimalla (2019). The scale used in this study consists of 24 items covering dimensions of cohesion, flexibility, and communication. The response options for the FACES-IV scale in this study were modified to six response options ranging from 1 (very inappropriate) to 6 (very appropriate). Based on the pilot test conducted, this scale had a reliability coefficient alpha ( $\alpha$ ) of 0.92, with the total item correlation values ranging from 0.33 to 0.77, indicating that all items had good discriminant power.

**Hope.** Hope in this study was measured using the Adult Hope Scale (AHS) developed by Snyder et al. (1991) and adapted by Novrianto and Menaldi (2022). The AHS scale consists of 12 items covering two components, namely agency and pathways. In this case, four items constitute the agency subscale, four items constitute the pathways subscale, and the remaining four items serve as fillers intended to divert attention. The response options for the AHS scale in this study were modified to six response options ranging from 1 (very inappropriate) to 6 (very appropriate). Based on the pilot test conducted, this scale had a reliability coefficient alpha ( $\alpha$ ) of 0.73, with the total item correlation values ranging from 0.30 to 0.63, indicating that all items had good discriminant power.

### **Data Analysis**

The data analysis technique in this study was simple mediation analysis. Mediation analysis is a statistical method aimed at testing the interaction between independent variables on the dependent variable through a mediator variable (Hayes, 2018). This analysis was used to test the mediating role of hope in the relationship between family functioning and post-traumatic growth among survivors of the Mount Semeru eruption disaster. The entire process of mediation analysis was conducted using the statistical analysis software SPSS version 25.0.

### **Results**

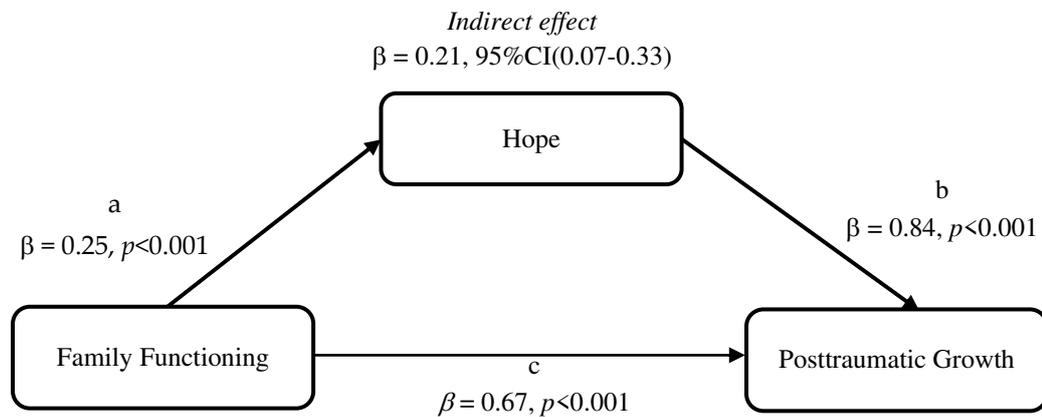
The hypothesis testing of this study was conducted using PROCESS analysis by Hayes (2018) based on the significance of the indirect effect using the bootstrapping method. The results of hypothesis testing can be seen in Figure 1.

Based on Figure 1, it is evident that family functioning has a significant effect on hope ( $\beta=0.25$ ;  $p<0.001$ ), and hope has a significant effect on post-traumatic growth ( $\beta=0.84$ ;  $p<0.001$ ). The total effect of family functioning on post-traumatic growth also shows significant results ( $\beta=0.67$ ;  $p<0.001$ ). Meanwhile, the bootstrap confidence interval does not pass through 0, indicating that the indirect effect is statistically significant ( $\beta=0.21$ ; 95% CI (0.07-0.33)). This means that family functioning affects post-traumatic growth in survivors by increasing hope. The results of the mediation analysis indicate that hope plays a mediating role in the relationship between family functioning and post-traumatic growth. Thus, it can be concluded that the hypothesis in this study is accepted. As for the direct effect between family functioning and post-traumatic growth without involving the mediator variable, it still

shows significant results ( $\beta=0.46$ ;  $p<0.001$ ), indicating that the mediating role of hope in this study is partial mediation.

### Figure 1

*Relationship Between Family Functioning, Hope, and Post-traumatic growth*



The analysis results indicate the  $R^2$  values, indicating how much the variables in the research model affect post-traumatic growth and hope. The  $R^2$  value for post-traumatic growth as the dependent variable is 0.5067, meaning that 50.67% of the variance in post-traumatic growth can be explained by family functioning and hope. Meanwhile, the  $R^2$  value for the hope variable is 0.5002, indicating that 50.02% of the variance in hope can be explained by family functioning. As for the  $R^2$  value for the total effect of family functioning on post-traumatic growth, it is 0.4603, suggesting that 46.03% of the variance in post-traumatic growth can be explained by family functioning.

### Discussion

This study aims to examine the role of hope as a mediator in the relationship between family functioning and post-traumatic growth among survivors of the Mount Semeru eruption disaster. The results indicate that the indirect effect of family functioning on post-traumatic growth through hope is significant. This means that hope can mediate the relationship between these two variables, thus the hypothesis of this study is accepted. The role of hope as a mediator is consistent with previous research indicating that hope can mediate post-traumatic growth in individuals ([Laslo-Roth et al., 2022](#); [Zhou et al., 2018](#)). Hope plays a crucial role, not only in explaining the relationship between family functioning and post-traumatic growth but also as a protective factor for mental health, making it crucial during challenging transition periods ([Colla et al., 2022](#)). Hope can have relevant effects in promoting growth and managing challenges ([Shorey et al., 2007](#)), such as its role in psychological adjustment when individuals experience difficulties or traumatic events ([Liu et al., 2017](#)).

This study shows that hope acts as a mediator in the relationship between family functioning and post-traumatic growth, with 50.67% of the variation in post-traumatic growth explained by family functioning and hope. In the context of the Mount Semeru eruption disaster, the survivors experienced significant life changes due to the losses suffered as a result of the disaster. Furthermore, the survivors had to be relocated or move to new residences, which affected their livelihoods and required them to adjust to various daily activities in the new environment. In this context, a well-functioning family can provide both

instrumental and emotional support to meet the needs of its members even in crises ([Li et al., 2021](#)). For example, family members who support each other and can adapt to the changes they experience will enable survivors to feel stable and reassess their life goals. This reassessment allows them to develop steps to achieve these goals for their future survival. This means that survivors can develop hope, or the perception of their ability to create pathways to achieve their goals, along with the belief in their capacity to follow these pathways to reach their goals ([Snyder et al., 2003](#)).

Hope can affect how survivors react to the post-disaster crisis situations they face. This aligns with Laslo-Roth et al. ([2022](#)) who explain that hope has a particular value during periods of stress because it emphasizes future expectations and goals, while also activating personal and interpersonal resources as pathways to thinking. Furthermore, agency thinking in hope, which relates to an individual's perceived ability to use methods to achieve desired goals, can trigger cognitive reappraisal and help individuals transform the meaning of traumatic events into a more positive perspective, thereby helping growth ([Feldman & Snyder, 2005](#); [Zhou et al., 2018](#)). In this context, individuals with high levels of hope tend to persist in achieving their goals despite difficulties, or they determine alternative goals as the best decision ([Hullmann et al., 2014](#)). For example, survivors of the Mount Semeru eruption with high levels of hope will strive to achieve their goals despite the challenges posed by the impact on their livelihoods or will determine alternatives as the best course of action. This could be demonstrated by changing professions or continuing their work with consequences such as a longer commute. This also indicates that hope can encourage individuals to engage in active coping strategies, thereby facilitating post-traumatic growth ([Germann et al., 2015](#)).

The results of this study show partial mediation, as family functioning continues to have a significant direct effect on post-traumatic growth even when the variable of hope is controlled. Additionally, 46.03% of the total variation in post-traumatic growth can be explained by family functioning, indicating that family functioning has a substantial impact on post-traumatic growth. These results align with previous research that found significant correlations between family cohesion, flexibility, communication, and post-traumatic growth ([Augustine, 2014](#); [Teixeira & Pereira, 2013](#)). Furthermore, these results indicate that post-traumatic growth in survivors of the Mount Semeru eruption is also relational, as it can be influenced by the quality of relationships with those around them after the disaster. This is consistent with the assertion by Augustine ([2014](#)) that in post-disaster situations, an individual's ability to function optimally also depends on external factors such as family, friendships, availability of job opportunities, and the ability to participate in social activities. Thus, it can be understood that the positive changes in survivors after experiencing a disaster are influenced not only by personal factors but also by relational external factors such as family functioning.

In survivors of the Mount Semeru eruption, it can be understood that family becomes a crucial factor for survivors to overcome the challenges or difficulties arising from the eruption disaster. One reason is that survivors are placed in permanent housing randomly and lose their social networks in their previous place of residence, so the main source of support for them after relocation is their family. This is consistent with the theory of the post-traumatic growth model ([Tedeschi & Calhoun, 2004](#)), which emphasizes the significant role of external factors in the process of post-traumatic growth formation. Disaster events challenge survivors' beliefs or perspectives on their lives, leading survivors to engage in rumination or reflection automatically. The presence of a well-functioning family can help survivors cope with this. In families that function well, there is a healthy communication pattern that allows individuals within it to express themselves ([Olson et al., 2019](#)). This self-

disclosure is crucial for encouraging post-traumatic growth in crisis situations such as disasters because it allows survivors to share their feelings and thoughts, ultimately leading to a positive reinterpretation of the traumatic events experienced ([Tedeschi & Calhoun, 2004](#); [Putri, 2023](#)). Additionally, disaster events can also affect family functioning by increasing attachment among family members ([Lingaard et al., 2009](#)), indicating positive changes in interactions between survivors and their families, which is also an indication of post-traumatic growth ([Tedeschi et al., 2018](#)).

The finding that post-traumatic growth in survivors of the Mount Semeru eruption is also relational and simultaneously confirms the thriving through relationship model ([Feeney & Collins, 2015](#)). In challenging circumstances, the family's function as a source of strength (SOS) emphasizes support as a safe haven that provides a sense of safety and protection, as well as alleviating the burden experienced by individuals during difficulties ([Collins & Feeney, 2000](#)). SOS fulfills these functions by acknowledging the need for dependence from individuals, providing emotional comfort, offering assistance or support to alleviate burdens, and providing a comfortable environment for the expression of negative emotions in difficult situations ([Feeney & Collins, 2015](#)). This is in line with the family's ability to fulfill its function in meeting individual needs through cohesion, flexibility, and good communication ([Olson et al., 2019](#)).

The thriving through relationship model explains that well-functioning social relationships such as families providing SOS support can contribute to the development of internal resources in individuals experiencing traumatic events ([Feeney & Collins, 2015](#)). The presence of SOS support functions can encourage survivors to challenge themselves to grow, rediscover their purpose in life, and seize every opportunity to achieve their goals. Furthermore, these functions can enhance survivors' hope by building and expanding their resources even in crisis situations ([Snyder et al., 1991](#)) which can then lead to growth ([Germann et al., 2015](#); [Zhou & Wu, 2018](#)). Thus, this research also confirms the model empirically by indicating that family functioning can affect post-traumatic growth, both directly and indirectly through hope as a mediator.

The results of this study indicate that survivors cannot endure post-disaster crises alone but also require support from those around them to grow together. This underscores the importance of social cohesion, which is indeed one of the critical protective factors in collectivist societies, capable of preventing mental health issues and strengthening resilience among survivors in post-disaster situations ([Sobhaninia, 2024](#)). These findings offer a new perspective on addressing psychological issues among disaster survivors, which have traditionally been predominantly focused on the individual level. Moreover, post-disaster recovery efforts in Indonesia generally have a family-based approach, yet often lack practical psychological aspects, instead primarily concentrating on physical or economic aspects. Thus, the results of this study can provide insights into the importance of psychological interventions for disaster survivors, not only at the individual level but also at the relational level concerning the family conditions of the survivors.

This study has several limitations. First, family functioning in this study refers to participants' perceptions as individuals within their families, without considering the actual functioning of their families based on the perceptions of all family members. Second, this research was specifically conducted on survivors of the Mount Semeru eruption disaster, so caution is needed when generalizing the research findings to other individuals who have experienced traumatic events. Third, this study did not control for the level of exposure to traumatic events, which may potentially affect the dynamics of post-traumatic growth experienced by participants. Future research could consider using qualitative methods to provide deeper insights into the dynamics of post-traumatic growth, family functioning, and

hope among disaster survivors. Additionally, data collection could involve paired family members (e.g., spouses) to understand the interdependence within family members through dyadic analysis, allowing for a more objective understanding of family functioning. Further research could also involve participants in different disaster contexts. Moreover, the level of exposure to traumatic events experienced by participants could be incorporated to understand the dynamics of post-traumatic growth more comprehensively.

The results of this research can provide benefits for survivors of the Mount Semeru eruption disaster to grow from their traumatic experiences. This can be achieved by enhancing hope through pathways thinking and agency thinking. This research also highlights the importance of family functioning, which significantly influences the posttraumatic recovery process of survivors. This shows the importance of interventions for disaster survivors that not only focus on individual management but also relational aspects by involving the family. Furthermore, family-based post-disaster recovery efforts are expected to not only focus on physical or economic aspects, but also on psychological aspects related to family cohesion, flexibility, and communication. In this regard, the results of this research can provide input for stakeholders regarding the development of holistic interventions for survivors of the Mount Semeru eruption disaster, both at the individual level related to their hopes and at the relational level related to their family functioning.

## Conclusion

This study aimed to examine the mediating role of hope in the relationship between family functioning and post-traumatic growth among survivors of the Mount Semeru eruption disaster. The analysis results indicate that hope can mediate the role of family functioning in post-traumatic growth among survivors. This mediating role is partial, meaning that family functioning can affect post-traumatic growth both directly and indirectly through hope as a mediator. The results of this study also indicate that post-traumatic growth among survivors of the Mount Semeru eruption disaster is not only individual but also relational, as it involves the important role of family functioning.

## Declarations

**Author contribution.** First author contributed to designing the research, collecting and analyzing data, and writing the manuscript. Second author contributed to supervising the research design, reviewing the data analysis and the discussion of the results.

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