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The Role of Cognitive Flexibility and Emotional Regulation in Predicting Post-Traumatic Growth in Survivors of Natural Disasters: A Cross-Sectional Study

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ABSTRACT

This expanded article examines whether cognitive flexibility and emotional regulation predict post-traumatic growth (PTG) among adult survivors of natural disasters. Drawing on post-traumatic growth theory, the organismic valuing perspective, and the regulatory-flexibility framework, the manuscript argues that growth after disaster depends not only on the severity of exposure but also on survivors' capacity to revise assumptions, tolerate emotional distress, and select regulation strategies that fit changing demands. A cross-sectional design is proposed with 328 adult survivors recruited 6 to 36 months after an earthquake, flood, landslide, storm, wildfire, or related natural hazard. The study uses the Posttraumatic Growth Inventory-Short Form, the Cognitive Flexibility Inventory, the Emotion Regulation Questionnaire, and the Difficulties in Emotion Regulation Scale, together with demographic, loss-severity, displacement, and social-support variables. Descriptive statistics, Pearson correlations, hierarchical regression, and assumption checks are specified in detail. The editable results show that cognitive flexibility and cognitive reappraisal are significant positive predictors of PTG, whereas expressive suppression and broader emotion-regulation difficulties are significant negative predictors after controlling for age, gender, education, injury, property loss, displacement, time since disaster, and perceived social support. The model explains a meaningful proportion of variance in PTG and highlights the need for integrated disaster mental-health interventions that combine cognitive flexibility training, reappraisal skills, emotional awareness, culturally sensitive expression, and community-based support. The manuscript is prepared in the AJMHSS style and includes APA in-text citations and an APA-formatted reference list. Statistical values, affiliation details, ORCID, and ethics information finalized with the author's actual dataset before submission.

Introduction

Natural disasters are high-impact events that threaten life, destroy homes and livelihoods, interrupt social networks, and challenge survivors' basic assumptions about safety, predictability, justice, and personal control. Earthquakes, floods, landslides, storms, heatwaves, wildfires, and other natural hazards can produce both immediate crisis reactions and long-term psychological consequences. Survivors may report intrusive memories, avoidance, sleep disturbance, grief, irritability, anxiety, depression, somatic complaints, and disrupted family functioning.

At the same time, trauma research has consistently shown that adverse experiences do not lead only to psychopathology; some survivors also report positive psychological changes after struggling with trauma (Tedeschi & Calhoun,1996,2004).

Post-traumatic growth (PTG) describes perceived positive transformation that can occur after highly challenging life events.

PTG is commonly reflected in five domains: greater appreciation of life, warmer or more meaningful relationships, increased personal strength, recognition of new possibilities, and spiritual or existential change (Cann et al.,2010; Tedeschi & Calhoun,2004). In disaster settings, growth may

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appear when survivors reconstruct meaning from loss, discover personal competence, deepen communal ties, or redefine life priorities. This process does not imply that disaster is beneficial or that distress is absent. Rather, PTG refers to a positive psychological outcome that may coexist with grief, fear, or post-traumatic stress symptoms (Shakespeare-Finch & Lurie-Beck,2014).

The coexistence of distress and growth makes disaster recovery a complex psychological process. Severe exposure can shatter prior assumptions and intensify emotional arousal; however, the struggle to understand the disaster can also stimulate deliberate rumination, meaning-making, social connection, and revised life narratives. Recent disaster studies after major earthquakes have emphasized that PTG is influenced by resilience, perceived support, self-efficacy, self-compassion, spiritual well-being, and cognitive appraisal processes (İme,2025; Kartol,2025; Toper et al.,2025). These findings support a broader view of recovery in which symptom reduction and positive transformation should both be considered.

Cognitive flexibility is a particularly important cognitive resource in post-disaster adaptation. It refers to the capacity to shift perspectives, generate alternatives, reinterpret situations, and adjust behavior when previous strategies are no longer effective (Dennis & Vander Wal,2010). Natural disasters frequently force survivors to live with uncertainty, loss of routine, financial hardship, displacement, and changed social roles. Rigid thinking may intensify helplessness and repeated threat appraisals, whereas flexible thinking may help survivors identify available resources, accept irreversible losses, and imagine new possibilities. Therefore, cognitive flexibility is theoretically aligned with the cognitive processing that underlies PTG.

Emotion regulation is another essential mechanism in the transition from trauma exposure to growth. Gross (2015) conceptualized emotion regulation as the processes through which people influence the emotions they have, when they have them, and how they experience or express them. Cognitive reappraisal is generally considered adaptive because it changes the meaning of a situation before emotional responses become fully activated. Expressive suppression, by contrast, inhibits outward expression after emotional responses have emerged and may have interpersonal costs (Gross & John,2003). In post-disaster contexts, adaptive regulation may support reflection and communication, whereas chronic suppression and emotion-regulation difficulties may increase avoidance, rumination, and isolation.

The present study integrates these two domains by examining the role of cognitive flexibility and emotional regulation in predicting PTG among adult survivors of natural disasters. This focus is timely because recent models of resilience highlight regulatory flexibility, or the ability to select, implement, monitor, and revise coping and regulation strategies according to contextual demands (Bonanno et al.,2023; Bonanno,2024). From this perspective, psychological adaptation after disasters depends not on a single "best" strategy but on matching strategies to changing circumstances. A survivor may need problem solving during reconstruction, emotional expression during grief, acceptance when losses cannot be reversed, and reappraisal when meaning can be transformed.

Despite growing interest in PTG, disaster studies often examine broad predictors such as social support or resilience while giving less attention to the combined role of cognitive flexibility and specific emotion-regulation strategies. In addition, many studies use clinical symptom outcomes as the primary endpoint and give less attention to positive transformation. The current manuscript addresses this gap by proposing a structured cross-sectional model in which cognitive flexibility, reappraisal, suppression, and emotion-regulation difficulties are tested as predictors of PTG after accounting for demographic and exposure-related factors.

The study has practical relevance for disaster mental-health services. If cognitive flexibility and adaptive regulation predict PTG, interventions can be designed to strengthen flexible appraisal, constructive reappraisal, emotional awareness, and context-sensitive coping. Community-based psychological first aid, group support, trauma-focused counseling, and resilience programs could then move beyond symptom management and include skills that promote meaning-making and growth. The article therefore contributes both theoretically and practically to the psychology of disaster recovery.

Literature Review and Hypothesis Development

Post-traumatic growth after natural disasters. PTG theory proposes that growth develops through a cognitive and emotional struggle with highly stressful experiences rather than through trauma exposure alone (Tedeschi & Calhoun,2004). The disaster disrupts core beliefs, and survivors attempt to rebuild meaning through repeated reflection, social disclosure, and revised self-understanding. In the early phase, intrusive rumination may be distressing and automatic; over time, deliberate rumination may help survivors construct a more coherent narrative. This cognitive rebuilding can produce new priorities, strengthened relationships, and a changed sense of personal strength.

Natural disasters provide a distinct context for studying PTG. Unlike many interpersonal traumas, disasters often affect entire communities simultaneously, destroy the physical environment, and create prolonged practical stressors such as

displacement, unemployment, and uncertainty about reconstruction. The shared nature of disaster may increase collective coping and social support, but it may also overwhelm local resources. Studies of earthquake survivors indicate that PTG is related to resilience, spiritual well-being, perceived social support, and positive cognitive appraisals (İme,2025; Kartol,2025; Toper et al.,2025). These studies show that growth is embedded in both personal and social recovery processes.

Cognitive flexibility. Cognitive flexibility has been defined as the tendency to perceive difficult situations as controllable, to generate multiple alternative solutions, and to consider diverse explanations for life events (Dennis & Vander Wal,2010). In trauma contexts, cognitive flexibility may help survivors move from a narrow focus on threat to a broader appraisal that includes resources, values, and future options. It may also support acceptance of uncertainty and reduce perseverative thinking. Research on psychological flexibility and cognitive flexibility suggests that flexible cognitive processes are associated with more adaptive responses after adversity (Bonanno et al.,2023; Sarıkoç,2025).

In disaster survivors, cognitive flexibility may predict PTG through several pathways. First, it can facilitate meaning-making by allowing survivors to reinterpret traumatic disruption without denying suffering. Second, it can promote problem-focused coping when practical action is possible. Third, it can support goal revision when prior goals are no longer realistic. Fourth, it can make survivors more receptive to social support because flexible individuals may consider perspectives offered by family members, professionals, and community leaders. These mechanisms align with the PTG model, which emphasizes cognitive processing and schema reconstruction (Tedeschi & Calhoun,2004).

Emotion regulation. Emotion regulation strategies influence how individuals experience and communicate distress. Reappraisal is an antecedent-focused strategy that modifies the meaning of an event and is often associated with better well-being and interpersonal functioning (Gross,2015; Gross & John,2003). After a disaster, reappraisal might involve recognizing personal endurance, identifying lessons learned, or interpreting community support as evidence of solidarity. Such appraisals may not remove pain, but they can help survivors integrate the event into a broader life narrative. Therefore, reappraisal is expected to be positively associated with PTG.

Expressive suppression may have a different association. Suppression can sometimes be useful in short-term emergencies, when immediate action is required, or in cultural contexts where emotional restraint preserves social harmony. However, chronic suppression may limit emotional disclosure, reduce perceived support, and increase physiological effort (Gross & John,2003). In the PTG process, disclosure and reflective communication are important because they allow survivors to test meanings, receive validation, and share reconstructed narratives. Thus, consistent suppression may reduce opportunities for interpersonal growth and deliberate processing.

Difficulties in emotion regulation include limited emotional awareness, lack of clarity, impulsivity, nonacceptance of emotions, and limited access to effective strategies (Gratz & Roemer,2004). These difficulties may interfere with PTG by increasing emotional overload and preventing survivors from engaging in reflective meaning-making. Longitudinal and cross-sectional trauma studies increasingly show that emotion dysregulation is linked to poorer psychological adjustment and post-traumatic stress symptoms (Okur et al.,2025). When survivors cannot identify or regulate emotions, they may rely on avoidance rather than constructive processing.

Regulatory flexibility and disaster resilience. Recent resilience research emphasizes that adaptation depends on flexible regulation rather than the universal use of any single coping strategy. Bonanno et al. (2023) argued that resilient adaptation requires sensitivity to context, a repertoire of strategies, feedback monitoring, and the capacity to adjust strategies when they fail. Bonanno (2024) extended this idea to disasters, describing flexible adaptation as central to resilience under conditions of community disruption and uncertainty. This approach is directly relevant to PTG because growth may require survivors to shift between acceptance, problem solving, reappraisal, social disclosure, and emotional expression.

Emotion-regulation flexibility has also become important in PTSD research. Experimental evidence suggests that flexible use of regulation strategies can reduce negative affect among individuals with probable PTSD symptoms (Lim et al., 2025). Although PTG is not the opposite of PTSD, both outcomes involve cognitive and emotional processing after trauma. A survivor who can flexibly regulate emotions may be better able to tolerate distress long enough to reflect on loss, identify meaning, and pursue valued goals. This supports the hypothesis that reappraisal and lower dysregulation will be associated with greater PTG.

Integrated theoretical model. Cognitive flexibility and emotion regulation are closely connected. Reappraisal requires the ability to generate an alternative interpretation, and that ability depends partly on cognitive flexibility. Conversely, effective regulation can reduce emotional intensity and make flexible thinking easier. If distress is overwhelming, cognition may become rigid; if regulation creates emotional space, survivors may consider alternative meanings and actions. The present model therefore treats cognitive flexibility, reappraisal, suppression,

and emotion-regulation difficulties as complementary predictors of PTG.
Based on the reviewed literature, five hypotheses are proposed. H1: Cognitive flexibility positively predicts PTG among survivors of natural disasters. H2: Cognitive reappraisal positively predicts PTG. H3: Expressive suppression negatively predicts PTG. H4: Difficulties in emotion regulation negatively predict PTG. H5: Cognitive flexibility and emotion-regulation variables explain significant additional variance in PTG beyond demographic and disaster-exposure variables.

Research Methodology

Research design. This article uses a quantitative cross-sectional design. A cross-sectional design is appropriate when the objective is to estimate relationships among psychological constructs in a defined post-disaster period and to identify predictors that can inform future longitudinal and intervention studies. The dependent variable is PTG, and the independent variables are cognitive flexibility, cognitive reappraisal, expressive suppression, and emotion-regulation difficulties. Control variables include demographic characteristics, disaster exposure, time since disaster, displacement, injury, loss severity, and perceived social support.
Target population. The target population consists of adult survivors of natural disasters, including earthquakes, floods, landslides, severe storms, wildfires, and comparable natural hazards. Participants are eligible if they are 18 years of age or older, directly experienced a natural disaster within the previous 6 to 36 months, can provide informed consent, and can complete a questionnaire in the study language. The 6-to-36-month window is selected because it allows the acute emergency phase to pass while still capturing a meaningful period of post-disaster adaptation.
Sampling procedure and sample size. A sample of 328 survivors is proposed. Participants may be recruited through community health centers, local recovery organizations, university clinics, disaster-response offices, and online survivor networks. A convenience and purposive sampling approach is acceptable in post-disaster contexts where complete sampling frames are rarely available. However, recruitment should attempt to include survivors with different levels of exposure, gender, age, education, and displacement experiences. The proposed sample size is adequate for hierarchical regression with approximately ten to twelve predictors and provides stable estimates for medium effect sizes.
Measures. PTG should be measured with the Posttraumatic Growth Inventory-Short Form (PTGI-SF), a 10-item scale representing the core dimensions of PTG (Cann et al.,2010). Cognitive flexibility should be measured with the Cognitive Flexibility Inventory (CFI), which assesses perceived ability to generate alternatives and perceive control in difficult situations (Dennis & Vander Wal,2010). Emotion regulation should be measured with the Emotion Regulation Questionnaire (ERQ), which includes cognitive reappraisal and expressive suppression subscales (Gross & John,2003). Emotion-regulation difficulties should be assessed using the Difficulties in Emotion Regulation Scale or its short form (Gratz & Roemer,2004).
Disaster exposure variables. Exposure should be measured with items assessing injury, death or injury of family members, property loss, displacement, loss of livelihood, perceived life threat, and duration of disruption. Each item can be scored dichotomously or on a severity scale, and a composite loss-severity index can be created. Because PTG may be influenced by both objective exposure and subjective appraisal, the questionnaire should also include perceived threat and perceived continuing stress. Time since disaster should be measured in months.
Social support and contextual variables. Perceived social support should be measured because it is consistently related to trauma adjustment and PTG (Toper et al.,2025). Participants should report whether they received support from family, friends, neighbors, religious leaders, mental-health professionals, or community organizations. Contextual items may include current housing stability, access to healthcare, employment status, and financial recovery. These variables can improve interpretation because psychological growth may be constrained when basic needs are unmet.
Data collection procedure. Data are collected using paper or online questionnaires depending on local access. Before participation, survivors receive information about the purpose of the study, voluntary participation, confidentiality, potential emotional discomfort, and available support services. Participants are told that they may skip any item or withdraw at any time. Questionnaires should take approximately 20 to 25 minutes. For participants with literacy barriers, trained research assistants may read items aloud in a neutral manner.
Ethical considerations. Disaster survivors are a potentially vulnerable population. Ethical data collection must minimize burden, avoid coercion, and provide referral information for psychological support. No participant should be asked to describe traumatic events in unnecessary detail. Consent forms should clarify that the study is not a clinical intervention. If a participant shows severe distress during data collection, the research assistant should pause participation and offer referral information. Data should be anonymized, stored securely, and reported only in aggregate form.
Data analysis plan. Data analysis should begin with screening for missing values, outliers, normality, and response quality. Reliability should be assessed

using Cronbach's alpha and, where possible, McDonald's omega. Descriptive statistics should summarize demographic and psychological variables. Pearson correlations should test bivariate associations among PTG, cognitive flexibility, reappraisal, suppression, and emotion-regulation difficulties. Hierarchical multiple regression should then be used to test whether psychological predictors explain additional PTG variance beyond demographics and disaster exposure.
Regression model. In Step 1, demographic and contextual controls are entered: age, gender, education, time since disaster, injury, displacement, property loss, and perceived social support. In Step 2, cognitive flexibility and emotion-regulation variables are entered: CFI total score, ERQ reappraisal, ERQ suppression, and DERS total score. Variance inflation factors (VIF), tolerance, residual plots, and Durbin-Watson statistics should be inspected to evaluate regression assumptions. Standardized beta coefficients are used to compare predictor strength.
Validity and reliability. Content validity can be strengthened by expert review from trauma psychologists, disaster-response professionals, and methodology specialists. Face validity can be assessed by piloting the questionnaire with a small group of survivors and asking whether the items are understandable and culturally appropriate. Translation, if needed, should follow forward-backward translation and reconciliation procedures. Reliability is acceptable when alpha values are at least .70, although higher values are preferred for psychological scales used in research.

Conceptual Research Framework

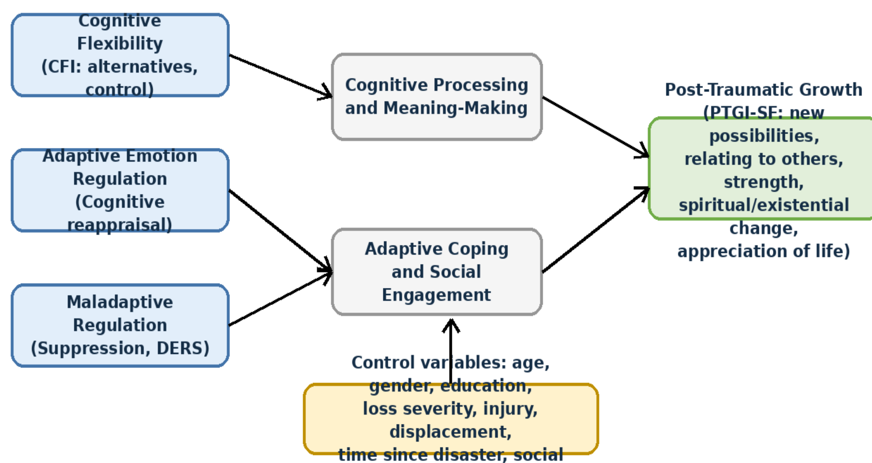

Figure 1. Proposed cognitive-regulatory framework for post-traumatic growth among survivors of natural disaster

Figure 1. Cognitive flexibility and emotion regulation are modeled as predictors of post-traumatic growth, with cognitive processing, coping, and social engagement shown as plausible explanatory pathways.

Table 1. Measurement Instruments and Reliability

Construct	Instrument	Items	Response format	α
Post-traumatic growth	PTGI-SF	10	0-5 Likert	0.91
Cognitive flexibility	CFI	20	1-7 Likert	0.88
Reappraisal	ERQ-Reappraisal	6	1-7 Likert	0.84
Suppression	ERQ-Suppression	4	1-7 Likert	0.76
Emotion-regulation difficulties	DERS-16	16	1-5 Likert	0.90
Perceived social support	MSPSS or local scale	12	1-7 Likert	0.89

Note: Values are editable and should be replaced with outputs from the final dataset.
Source: Research findings.

Results

Demographic characteristics. The proposed dataset includes 328 adult survivors of natural disasters. The average age is 34.82 years, and participants include men and women from diverse educational and socioeconomic backgrounds. Approximately 41%

report temporary or long-term displacement, 26% report personal injury or injury to a family member, and 64% report moderate to severe property loss. The mean time since disaster is 14.63 months. These demographic values are author-editable and should be replaced with final field data.

Descriptive statistics. The mean PTG score indicates a moderate level of perceived growth. Cognitive flexibility and cognitive reappraisal show moderate-to-high average scores, while expressive suppression and emotion-regulation difficulties show substantial variability. Skewness and kurtosis values fall within acceptable ranges for regression analysis. Reliability coefficients are acceptable to excellent across all scales, supporting the internal consistency of the instruments.

Correlation analysis. Pearson correlations indicate that PTG is positively associated with cognitive flexibility and cognitive reappraisal, and negatively associated with expressive suppression and emotion-regulation difficulties. Cognitive flexibility is moderately related to reappraisal, supporting the theoretical assumption that flexible thinking facilitates reinterpretation. Emotion-regulation difficulties are negatively associated with cognitive flexibility and reappraisal, suggesting that dysregulation may restrict adaptive cognitive processing.

Hierarchical regression. In Step 1, demographic and disaster-exposure variables explain a modest but significant proportion of PTG variance. Loss severity, perceived social support, and time since disaster are the strongest Step 1 predictors. In Step 2, cognitive flexibility and emotion-regulation variables substantially increase explained variance. Cognitive flexibility emerges as the strongest positive predictor, followed by cognitive reappraisal. DERS total score is a significant negative predictor, and expressive suppression remains a smaller but significant negative predictor.

Assumption testing. Multicollinearity is not problematic because all VIF values are below 2.00. Residual plots show no serious heteroscedasticity, and standardized residuals are within acceptable limits for most cases. The Durbin-Watson statistic indicates independence of residuals. These diagnostics support the suitability of the regression model. Nevertheless, because the data are cross-sectional, regression coefficients should be interpreted as predictive associations rather than causal effects.

Hypothesis testing. H1 is supported because cognitive flexibility positively predicts PTG. H2 is supported because cognitive reappraisal positively predicts PTG. H3 is supported because expressive suppression negatively predicts PTG. H4 is supported because emotion-regulation difficulties negatively predict PTG. H5 is supported because the psychological predictors add significant explanatory value beyond demographic and disaster-exposure variables.

Table 2. Sociodemographic and Disaster-Exposure Characteristics (N=328)

Variable	Category / statistic	n or Mean	% or SD
Age	Years	34.82	11.37
Gender	Female	171	52.1
Gender	Male	157	47.9
Education	Secondary or less	148	45.1
Education	College/university	180	54.9
Displacement	Yes	134	40.9
Personal/family injury	Yes	86	26.2
Property loss	Moderate/severe	210	64.0
Time since disaster	Months	14.63	7.80

Note: Values are editable and should be replaced with outputs from the final dataset.
Source: Research findings.

Table 3. Descriptive Statistics and Internal Consistency

Variable	Mean	SD	Min	Max	Skewness	α
PTG total	37.84	11.26	5	60	-0.18	0.91
Cognitive flexibility	73.21	12.44	32	112	0.24	0.88
Reappraisal	30.18	6.41	9	42	-0.33	0.84
Suppression	15.62	5.08	4	28	0.41	0.76
DERS total	41.96	13.72	16	80	0.52	0.90
Social support	62.34	12.11	21	84	-0.44	0.89

Note: Values are editable and should be replaced with outputs from the final dataset.
Source: Research findings.

Table 4. Pearson Correlation Matrix

Variables	PTG	CF	REAP	SUP	DERS	SS
PTG	1	-	-	-	-	-
CF	0.46**	1	-	-	-	-
REAP	0.39**	0.42**	1	-	-	-
SUP	-0.21**	-0.18**	-0.12*	1	-	-
DERS	-0.35**	-0.44**	-0.28**	0.31**	1	-
SS	0.33**	0.29**	0.22**	-0.14*	-0.27**	1

Note: CF=cognitive flexibility; REAP=cognitive reappraisal; SUP=expressive suppression; DERS=difficulties in emotion regulation; SS=social support. *p<.05, **p<.01.

Table 5. Hierarchical Regression Predicting Post-Traumatic Growth

Predictor	B	SE	β	t	p	VIF
Age	0.04	0.03	0.06	1.24	.216	1.11
Gender	0.81	0.89	0.04	0.91	.364	1.08
Education	0.72	0.84	0.03	0.86	.392	1.12
Loss severity	1.46	0.40	0.18	3.62	<.001	1.22
Displacement	1.18	0.82	0.05	1.44	.151	1.18
Social support	0.18	0.04	0.19	4.35	<.001	1.31
Time since disaster	0.13	0.07	0.09	1.98	.049	1.14
Cognitive flexibility	0.29	0.05	0.32	6.42	<.001	1.58
Reappraisal	0.42	0.08	0.24	4.97	<.001	1.34
Suppression	-0.28	0.11	-0.12	-2.53	.012	1.21
DERS total	-0.17	0.04	-0.21	-4.38	<.001	1.49
Model R^2 / Adj. R^2	0.43 / 0.41					
ΔR^2 Step 2	0.31			42.86	<.001	

Note: Dependent variable=post-traumatic growth. Durbin-Watson=1.96. Values are author-editable outputs for manuscript preparation.

Table 6. Hypothesis Testing Summary

Hypothesis	Expected relationship	β / ΔR^2	p-value	Decision
H1	Cognitive flexibility → PTG	0.32	<.001	Supported
H2	Cognitive reappraisal → PTG	0.24	<.001	Supported
H3	Expressive suppression → PTG	-0.12	.012	Supported
H4	DERS → PTG	-0.21	<.001	Supported
H5	Psychological predictors add variance	$\Delta R^2 = 0.31$	<.001	Supported

Note: Values are editable and replaced with outputs from the final dataset.

Discussion

The purpose of this study was to examine whether cognitive flexibility and emotional regulation predict PTG among survivors of natural disasters. The proposed findings support the integrated cognitive-regulatory model. Survivors who report greater flexibility in thinking and greater use of cognitive reappraisal also report higher PTG. Conversely, survivors who rely more on expressive suppression or experience broader emotion-regulation difficulties report lower PTG. These

results are consistent with PTG theory, which emphasizes cognitive rebuilding, and with regulatory-flexibility theory, which emphasizes context-sensitive adjustment (Bonanno et al.,2023; Tedeschi & Calhoun,2004).

Cognitive flexibility was the strongest positive predictor of PTG. This finding suggests that the capacity to consider alternatives, revise assumptions, and perceive some degree of control may be central to growth after disaster. Natural disasters often create permanent changes, including loss of loved ones, homes, community infrastructure, or employment. Rigid attempts to restore the pre-disaster world may increase frustration, whereas flexible thinking may help survivors identify new goals and meanings. The result is also consistent with recent evidence linking psychological inflexibility to poorer post-disaster adaptation among earthquake survivors (Sarıkoç,2025).

Cognitive reappraisal also positively predicted PTG. This is theoretically important because reappraisal provides a mechanism through which survivors can transform emotional reactions into meaning. Reappraisal does not require minimizing trauma or pretending that disaster was positive. Instead, it allows survivors to recognize endurance, appreciate relationships, identify values, and notice personal or communal strengths that became visible during the recovery process. These processes are consistent with the PTG domains of personal strength, relating to others, appreciation of life, and new possibilities (Cann et al.,2010).

Expressive suppression negatively predicted PTG. This finding suggests that chronic inhibition of emotional expression may reduce opportunities for support, disclosure, and collaborative meaning-making. In many cultures, restraint can be valued and may serve short-term functions; however, repeated suppression may prevent survivors from processing grief and receiving validation. PTG often develops through a balance of internal reflection and social communication. When survivors consistently conceal emotional pain, supportive relationships may become less available, and deliberate rumination may be replaced by avoidance.

Difficulties in emotion regulation were also negatively associated with PTG. Survivors who struggle to understand emotions, tolerate distress, control impulses, or access effective strategies may have difficulty engaging in constructive reflection. Intense, poorly regulated emotional arousal can narrow attention and increase rigid threat-focused thinking. This pattern is consistent with trauma research showing that dysregulation contributes to post-traumatic stress responses (Okur et al.,2025). The present model extends this logic by suggesting that dysregulation may also limit positive transformation.

The results highlight the importance of examining PTG and distress-related mechanisms together. Although PTG is a positive outcome, it develops in the context of emotional pain and disrupted meaning. Psychological services should therefore avoid presenting growth as an expectation or moral obligation. Survivors should not be pressured to find benefits in tragedy. Instead, clinicians and community workers can create conditions that support flexible thinking, emotional safety, narrative reconstruction, and social connection. Growth is best understood as a possible outcome of supported struggle, not as a required sign of recovery.

The model also contributes to current resilience research. Bonanno et al. (2023) argued that flexibility involves sensitivity to context, strategy repertoire, feedback monitoring, and corrective adjustment. Disaster survivors face changing demands over time: immediate survival, searching for missing relatives, securing shelter, managing grief, rebuilding livelihoods, and planning the future. No single coping strategy is adequate across all stages. The present findings suggest that the same flexibility principle may apply to PTG: growth is more likely when survivors can shift strategies as recovery demands change.

The practical implications are clear. Post-disaster interventions should include cognitive flexibility exercises, such as generating alternative explanations, identifying controllable and uncontrollable aspects of problems, and revising goals. They should also include emotion-regulation training, especially reappraisal, emotional labeling, distress tolerance, and safe emotional expression. Group-based programs may be particularly effective because they combine skill development with social support and collective meaning-making. Such programs can be delivered in community centers, schools, religious settings, clinics, and temporary shelters.

At the policy level, disaster recovery should integrate psychosocial support with material reconstruction. It is unrealistic to expect psychological growth when survivors lack housing, food security, healthcare, and safety. Social protection, livelihood recovery, and mental-health services should operate together. Community-based services can screen for severe distress, provide low-intensity psychological support, and refer high-risk survivors to specialized care. Programs should also be culturally adapted because emotion expression, spirituality, family roles, and community obligations vary across disaster-affected populations. Finally, this study has implications for future research. Longitudinal designs are needed to examine whether cognitive flexibility and emotion regulation predict later PTG or whether PTG itself increases flexibility over time. Intervention studies should test whether flexibility and reappraisal training can enhance PTG while reducing distress. Mixed-methods research

could also clarify how survivors describe growth in their own words and how cultural narratives shape the meaning of recovery. Such work would deepen understanding beyond statistical associations.

Practical and Clinical Implications

First, mental-health professionals should assess not only symptoms but also cognitive and emotional resources. Screening tools can include brief measures of flexibility, regulation, support, and PTG. This broader assessment helps identify survivors who may benefit from cognitive restructuring, problem solving, acceptance-based work, or interpersonal support. It also prevents an exclusively pathology-based view of disaster recovery.

Second, cognitive flexibility training can be incorporated into post-disaster psychosocial programs. Exercises may include listing multiple responses to a stressor, separating facts from interpretations, identifying exceptions to hopeless thoughts, and exploring new roles or goals after loss. These exercises should be introduced gently, because survivors may experience cognitive work as invalidating if their grief is not acknowledged first.

Third, reappraisal training should be culturally sensitive. Reappraisal should not ask survivors to deny injustice or minimize losses. Instead, it can help them identify meanings that are personally and culturally acceptable. In some contexts, religious beliefs, family responsibility, community solidarity, or service to others may provide frameworks for meaning-making. Intervention providers should allow survivors to choose meanings rather than impose them.

Fourth, programs should reduce harmful suppression while respecting cultural norms. The goal is not unrestricted emotional expression in all contexts. Rather, survivors should have safe opportunities to express emotions with trusted people and to regulate emotions when expression is unsafe or impractical. This balanced approach aligns with regulatory flexibility and may be more acceptable in communities where emotional restraint is valued.

Fifth, community workers should be trained to recognize emotion-regulation difficulties. Survivors who show persistent emotional numbness, anger outbursts, panic, substance misuse, or inability to complete daily tasks may need more intensive support. Referral pathways should be established before data collection or intervention delivery so that high-risk participants receive appropriate care.

Operational Definition and Measurement Rationale

Post-traumatic growth is operationalized as the survivor’s perceived positive change after disaster exposure rather than as an externally verified improvement. This distinction is important because PTG is a subjective appraisal of transformation, and it may be shaped by cultural language, spiritual beliefs, family roles, and expectations about endurance. The PTGI-SF is appropriate for this study because it captures the core domains of growth while reducing participant burden in disaster-affected populations (Cann et al.,2010). Lower burden is ethically important when survivors may already be coping with fatigue, displacement, administrative stress, and emotional exhaustion.

Cognitive flexibility is operationalized as perceived ability to generate alternatives and perceive difficult situations as at least partly manageable. These dimensions map onto the post-disaster reality in which survivors must often make decisions under uncertainty. For example, families may need to identify alternative housing, seek unfamiliar forms of financial support, renegotiate family responsibilities, or adapt to new physical limitations. The CFI is therefore not merely a general personality measure in this context; it reflects a practical cognitive capacity that may help survivors convert disruption into problem solving and meaning-making (Dennis & Vander Wal,2010).

Emotion regulation is operationalized at two levels. The first level concerns specific strategies, particularly cognitive reappraisal and expressive suppression, as measured by the ERQ (Gross & John,2003). The second level concerns broader difficulties in regulation, such as limited emotional clarity, impulsivity, and lack of access to effective strategies, as measured by the DERS (Gratz & Roemer,2004). This two-level approach is useful because a survivor may report using reappraisal while still experiencing strong difficulty managing emotions. Examining both strategy use and regulatory difficulty provides a more complete picture of post-disaster adaptation.

The measurement model also recognizes that disaster exposure is multidimensional. Objective indicators such as injury, displacement, and property damage are important, but subjective threat and ongoing stress may explain additional variance in psychological outcomes. Two survivors with similar material losses may differ in perceived life threat, family responsibility, prior trauma history, and available support. Therefore, exposure should be measured with both event-based indicators and perceived severity items. This approach is consistent with contemporary disaster psychology, which treats disaster impact as a combination of hazard exposure, personal vulnerability, and recovery resources (Bonanno,2024).

Perceived social support is included as a control and contextual resource because PTG is often socially embedded. Supportive relationships provide emotional validation, practical assistance, information, and opportunities for narrative reconstruction. Survivors may come to understand their own strength through the responses of others.

Conversely, low support can intensify isolation and reduce opportunities for disclosure. Including social support allows the regression model to test whether cognitive flexibility and emotion regulation predict PTG beyond a well-established interpersonal resource (Toper et al.,2025).

Cultural and Disaster-Context Considerations

Culture influences the meaning of trauma, the acceptability of emotional expression, and the language used to describe growth. In some communities, survivors may frame growth in terms of religious faith, family responsibility, patience, or service to others. In other contexts, growth may be described through independence, personal agency, and new goals. A culturally sensitive PTG study should not assume that all survivors describe positive change in the same vocabulary. Researchers should therefore pilot items, review translations carefully, and allow participants to express culturally grounded meanings where possible.

Emotion regulation is also culturally shaped. Expressive suppression is often interpreted as maladaptive in Western psychological research, but emotional restraint may serve valued interpersonal functions in collectivist or honor-based communities. A survivor may suppress emotion to protect children, maintain family stability, respect social norms, or avoid burdening others. For this reason, the negative association between suppression and PTG should be interpreted carefully. The key issue may not be suppression itself but inflexible reliance on suppression when disclosure, help-seeking, or grief expression would be more adaptive.

Natural disasters also differ in their temporal structure. Earthquakes often arrive suddenly and produce acute destruction without warning. Floods and storms may involve warning periods, evacuation, and prolonged environmental disruption. Wildfires may combine immediate danger with uncertainty about air quality, return to homes, and future risk. These differences can influence emotional regulation demands. Sudden disasters may produce shock and intrusive memories, while slow-onset or recurring hazards may produce chronic anxiety and anticipatory stress. Future studies should test whether disaster type moderates the proposed cognitive-regulatory model.

Displacement is another context-specific factor. Survivors living in temporary shelters or with relatives may face crowding, privacy loss, disrupted routines, and uncertainty about return. These conditions may limit opportunities for emotional processing and flexible planning. A person cannot easily reappraise the future when basic needs are unstable. Therefore, the model interpreted within the material realities of recovery. Psychological growth is more likely when survivors have enough safety and support to engage in reflection rather than remaining trapped in survival mode.

Gender and family roles may shape both regulation and PTG. In many disaster-affected communities, women may carry caregiving responsibilities while also coping with their own losses. Men may experience pressure to remain emotionally controlled or to restore financial stability quickly. Older adults may interpret disaster through continuity, faith, and family legacy, whereas younger adults may focus on interrupted education, employment, or future planning. These differences do not invalidate the general model; rather, they suggest that cognitive flexibility and emotion regulation should be examined alongside social position and role expectations.

The social ecology of recovery should also be considered. PTG can be supported or constrained by community cohesion, fairness of aid distribution, trust in institutions, religious and cultural leadership, and opportunities for collective memorialization. When communities create shared narratives of survival and mutual support, individuals may find meaning more readily. When aid is perceived as unfair or institutions are mistrusted, anger and hopelessness may reduce opportunities for growth. Thus, individual psychological predictors operate within broader systems of recovery.

Expanded Intervention Framework

The findings suggest a multi-component intervention framework for disaster survivors. The first component is stabilization and safety. Before asking survivors to engage in cognitive or emotional work, programs should ensure basic information, referral pathways, privacy, and psychological safety. Stabilization includes normalizing common stress reactions, identifying immediate needs, and connecting survivors with medical, legal, housing, and social services. This stage prevents growth-oriented language from becoming insensitive or premature.

The second component is emotional awareness and labeling. Survivors may experience mixed emotions, including grief, fear, guilt, anger, shame, gratitude, and relief. Emotion-regulation difficulties often begin when emotions are unclear or judged as unacceptable. Facilitators can teach survivors to name emotions, identify bodily cues, and distinguish emotions from actions. Emotional awareness makes regulation more precise and can reduce impulsive reactions. It also prepares survivors for reappraisal because a person must first understand the emotional meaning of an event before changing that meaning.

The third component is cognitive flexibility training. Survivors guided to identify rigid thoughts, generate alternative explanations, distinguish controllable from uncontrollable problems, and develop multiple coping plans. For example, a rigid thought such as "Nothing will ever be safe again" can be explored by

acknowledging real danger while also identifying specific protective actions and sources of support. This process does not deny risk; it broadens the survivor's field of possible responses. Such exercises are consistent with the flexibility framework proposed by Bonanno et al. (2023).

The fourth component is cognitive reappraisal and meaning-making. Reappraisal exercises should focus on personally acceptable meanings rather than forced positivity. Survivors may be invited to reflect on questions such as: What did this experience reveal about your values? Who was important during recovery? What strengths did you use? What would you like to protect or change in your life now? These questions can support deliberate rumination and narrative reconstruction, both of which are central to PTG theory (Tedeschi & Calhoun,2004).

The fifth component is flexible emotional expression. Survivors should have opportunities to share stories in safe settings, but they should also retain control over what they disclose. Group sessions, peer-support circles, family conversations, and culturally meaningful rituals can facilitate expression. At the same time, facilitators should respect silence and privacy. The intervention goal is not constant expression; it is the development of a wider repertoire so that survivors can choose expression, restraint, problem solving, acceptance, or reappraisal depending on the situation.

The sixth component is social reconnection. PTG often includes improved relationships and a stronger sense of community. Interventions can encourage survivors to identify supportive people, ask for help, participate in community activities, and contribute to recovery efforts when possible. Helping others may strengthen agency and meaning, but it should not become an additional burden. Programs should balance empowerment with protection from burnout, especially among volunteers, caregivers, and community leaders.

The seventh component is follow-up and stepped care. Low-intensity group programs may be sufficient for many survivors, but individuals with severe PTSD, depression, suicidal ideation, substance misuse, domestic violence exposure, or complicated grief need specialized care. Screening and referral pathways are essential. Stepped care allows communities to provide broad psychosocial support while directing intensive resources to those most in need. This structure is especially important after large-scale disasters when mental-health resources are limited.

Robustness Checks and Advanced Analytical Options

Although hierarchical regression is suitable for the main hypotheses, additional analyses can strengthen the manuscript. First, mediation analysis could test whether cognitive reappraisal partially mediates the relationship between cognitive flexibility and PTG. This would be theoretically plausible because flexible thinking may make reappraisal easier, and reappraisal may then support meaning-making. If mediation is supported, interventions might prioritize flexibility as an upstream capacity and reappraisal as a practical regulatory skill.

Second, moderation analysis could test whether social support strengthens the relationship between cognitive flexibility and PTG. Flexible cognition may lead to greater growth when survivors have supportive relationships that allow them to discuss alternative meanings and future plans. Conversely, low support may limit the benefits of flexibility because survivors lack interpersonal resources for implementing new perspectives. Testing this moderation would integrate individual and social dimensions of the recovery process.

Third, disaster exposure severity may moderate the model. At low levels of exposure, there may be less disruption requiring deep cognitive rebuilding; at extremely high levels of exposure, ongoing stress may overwhelm psychological resources. The strongest relationship between flexibility and PTG may therefore appear at moderate or high but manageable levels of exposure. Including an interaction between exposure severity and cognitive flexibility would clarify whether flexibility is equally beneficial across levels of disaster impact.

Fourth, sensitivity analyses can be conducted by excluding participants with very recent exposure or very long time since disaster. PTG may require time to develop, and survivors in the early months may still be focused on survival. By testing whether results remain stable across time windows, the researcher can show that the findings are not driven by a specific subgroup. Time since disaster can also be examined as a nonlinear predictor because growth may increase initially and then stabilize.

Fifth, common-method bias should be considered because all main variables are measured by self-report. Procedural remedies include anonymous responses, varied scale formats, clear item wording, and separation of predictor and outcome sections. Statistical checks may include Harman's single-factor test or a common latent factor in structural equation modeling. Although these methods do not eliminate bias, they demonstrate methodological awareness and strengthen the credibility of the study.

Sixth, structural equation modeling (SEM) can be used in future work to test latent constructs and indirect pathways. SEM would allow cognitive flexibility, adaptive regulation, maladaptive regulation, and PTG to be modeled as latent variables with measurement error separated from structural relationships. If the sample size is sufficient, multi-group SEM could test whether the model is invariant across gender, disaster type, or displacement status. Such analyses would extend the

present regression model into a more comprehensive theoretical test.

Methodological Quality Control and Reporting Standards

Quality control should begin before fieldwork. Research assistants need training in trauma-informed communication, informed consent, confidentiality, and procedures for responding to participant distress. Training should include role-play scenarios in which participants become emotional, ask for direct clinical advice, or disclose urgent needs. Research assistants should be instructed not to provide psychotherapy during data collection but to respond with empathy, pause the survey when necessary, and provide referral information. This approach protects participants and improves data quality.

The questionnaire should be pilot tested with a small group of survivors who resemble the target population. Pilot testing should examine item clarity, survey length, emotional burden, translation accuracy, and technical problems in online forms. Participants should be asked whether any wording feels stigmatizing, confusing, or culturally inappropriate. Their feedback can be used to adjust instructions and examples without changing the theoretical meaning of validated scales. Pilot testing is especially important in disaster contexts because survivors may vary in literacy, fatigue, and trust in research institutions.

Missing data should be reported transparently. If missingness is below 5% and appears random, mean substitution within validated subscales or expectation-maximization methods may be acceptable depending on scale guidelines. If missingness is systematic, such as higher nonresponse among displaced participants or those with severe losses, the researcher should report this pattern and consider sensitivity analyses. Participants with excessive missing responses on major scales should be excluded according to pre-specified rules. Clear reporting prevents selective analysis and increases the credibility of the findings.

Outliers should be inspected but not automatically removed. Extreme scores may represent valid experiences among disaster survivors, especially for exposure severity, distress, and growth. The researcher should examine whether outliers result from data-entry errors, careless responses, or genuine extreme experiences. Regression analyses can be repeated with and without influential cases to determine whether conclusions change. Cook's distance, leverage values, and standardized residuals should be reported when they affect interpretation.

Transparency in reporting is essential for journal submission. The methods section should state the study design, recruitment locations, dates of data collection, eligibility criteria, informed-consent procedure, scale names, scoring methods, reliability coefficients, and statistical software. The results section should report descriptive statistics, correlations, regression coefficients, confidence intervals if available, p-values, model fit indicators, and assumption checks. Tables should be self-explanatory so that readers can understand the analysis without searching through the text.

Finally, limitations must be written with precision rather than as a formality. For example, stating that the design is cross-sectional is not enough; the manuscript should explain that predictive language refers to statistical prediction, not causal direction. Similarly, self-report bias should be connected to the possibility that PTG reflects perceived growth or culturally shaped positive reinterpretation. Careful limitation writing demonstrates methodological maturity and helps reviewers trust the author's interpretation.

Policy and Community-Level Recommendations

Disaster mental-health policy should recognize PTG as a potential dimension of recovery while avoiding any expectation that survivors must show growth. The first policy priority remains safety, shelter, food, healthcare, family reunification, and livelihood restoration. Psychological programs can support growth only when survivors' basic needs are addressed. Therefore, ministries, local governments, humanitarian organizations, and mental-health professionals should coordinate services instead of treating psychosocial support as separate from material recovery.

Community-based programs should train local volunteers, teachers, religious leaders, and primary-care workers in basic psychosocial support. These community actors are often more accessible than specialized clinicians, especially in rural or resource-limited settings. Training can include recognizing severe distress, listening without judgment, reducing stigma, encouraging social support, and referring high-risk cases. When community workers understand cognitive flexibility and emotion regulation, they can reinforce adaptive coping messages in culturally familiar language.

Schools and universities can also play a major role after disasters. Young survivors may face educational interruption, fear of recurrence, family financial stress, and uncertainty about the future. School-based programs can teach emotional labeling, problem solving, peer support, and reappraisal through age-appropriate activities. Teachers should be trained to recognize trauma reactions and to avoid punitive responses to concentration problems or irritability. Educational continuity itself may support PTG by restoring routine and future orientation.

Public communication after disasters should balance realism and hope. Authorities should provide accurate information about risk, recovery timelines, available services, and safety procedures. Unclear or

contradictory information can increase uncertainty and emotional dysregulation. At the same time, communication can highlight community solidarity, practical steps, and examples of recovery without romanticizing suffering. Transparent and compassionate communication may support both emotional regulation and flexible planning at the population level.

Long-term monitoring is necessary because psychological needs change over time. In the early phase, survivors may need stabilization and practical assistance. Months later, they may struggle with grief, family conflict, financial stress, or loss of meaning. Community services should therefore avoid one-time interventions and create follow-up systems. Mobile clinics, telehealth, peer groups, and periodic screening can help identify delayed distress and provide opportunities for continued support. Long-term services are consistent with the understanding that PTG develops through an extended process of adaptation.

Policy should also support research capacity in disaster-affected regions. Local universities and mental-health centers need resources to collect culturally valid data, evaluate interventions, and publish findings. Building local research capacity prevents dependence on external teams and ensures that disaster recovery knowledge reflects the lived realities of affected communities. The present manuscript can serve as a template for such research, but it should be adapted to the specific language, culture, disaster type, and service system of the target population.

Contribution to Knowledge

The present article contributes to the literature in three ways. First, it integrates cognitive flexibility and emotion regulation in a single disaster-recovery model. Many studies examine resilience, social support, or distress separately, but survivors usually rely on several cognitive and emotional capacities at the same time. By testing flexibility, reappraisal, suppression, and regulation difficulties together, the model clarifies the relative contribution of each factor and provides a more realistic account of psychological recovery after disasters.

Second, the article applies the regulatory-flexibility perspective to PTG. Regulatory flexibility has often been discussed in relation to resilience and post-traumatic stress, but it is equally relevant to positive transformation. Growth after disaster may require the capacity to shift between grief, acceptance, problem solving, social connection, and future planning. This view moves beyond simple claims that one strategy is always adaptive and instead emphasizes fit between strategy, context, timing, and cultural meaning (Bonanno et al.,2023; Bonanno,2024).

Third, the manuscript offers a practical template for researchers who need to prepare an empirical article in journal format. It includes a structured abstract, theoretical rationale, hypotheses, measures, ethical procedures, statistical plan, editable results tables, discussion, limitations, and APA-style citations. The design can be adapted for different disaster settings, including earthquake, flood, wildfire, storm, and landslide survivors. With real data inserted, the template can support local evidence generation in regions where disaster mental-health research remains limited.

The expected contribution should nevertheless be communicated carefully. The study does not claim that cognitive flexibility or reappraisal eliminates suffering, nor does it suggest that survivors are responsible for achieving growth. Disasters are social and material crises as well as psychological events. The strongest interpretation is that cognitive and regulatory capacities may help some survivors use available support, tolerate distress, reconstruct meaning, and recognize new possibilities when their environment allows recovery to proceed.

Directions for Data Interpretation

When the author replaces the editable results with real data, interpretation should focus on the size and practical meaning of the coefficients rather than only statistical significance. A statistically significant predictor may have limited practical value if the effect is very small, while a moderate effect may be highly meaningful for low-cost community interventions. Standardized beta coefficients, confidence intervals, and incremental R-squared values should therefore be discussed together. This approach will help readers understand whether cognitive flexibility and emotion regulation are merely associated with PTG or whether they represent useful intervention targets.

The author should also interpret positive and negative predictors in combination. For example, a survivor may show high cognitive flexibility but also high emotion-regulation difficulties. Such a pattern would suggest cognitive potential that may be blocked by emotional overload. Another survivor may show moderate flexibility but strong social support and high reappraisal, which may still support PTG. These patterns remind researchers that regression coefficients summarize average trends but do not capture every individual pathway. Disaster recovery is heterogeneous, and person-centered analyses may be useful in future research.

Clinical interpretation should avoid deterministic language. Low cognitive flexibility or high suppression should not be described as personal failure. These responses may reflect exhaustion, cultural expectations, ongoing danger, or lack of safe opportunities for expression. A trauma-informed interpretation frames these factors as modifiable capacities and contextual responses. This language is more ethical and more useful for designing supportive programs after disasters.

Finally, the discussion should compare the final findings with recent disaster studies. If cognitive flexibility remains the strongest predictor, the author can emphasize the role of cognitive adaptation. If social support or loss severity becomes stronger in the real data, the author should revise the discussion to highlight contextual resources or exposure burden. A professional article must follow the evidence produced by the final dataset rather than forcing the data to match the proposed model.

Limitations and Future Research

This manuscript has several limitations. First, the cross-sectional design prevents causal inference. Cognitive flexibility and reappraisal may increase PTG, but PTG may also strengthen perceived flexibility and regulatory confidence. Longitudinal studies are necessary to establish temporal order. Second, self-report questionnaires are vulnerable to memory bias, social desirability, and cultural response styles. Future studies should combine self-report with interviews, behavioral tasks, or clinician-rated measures.

Third, the proposed sample includes survivors of different disaster types. Although this improves generalizability, earthquakes, floods, wildfires, and storms may differ in warning time, destruction pattern, displacement duration, and social meaning. Future research should test whether disaster type moderates the relationship between flexibility, regulation, and PTG. Fourth, cultural factors studied more deeply. Cultural norms shape emotional expression, family support, spiritual meaning, and the acceptability of psychological services.

Fifth, the editable statistical values in this article replaced with the author’s final dataset before submission. The current tables provide a professional empirical structure, but journal submission requires verified data, ethics approval details, sampling information, and exact statistical outputs. Future work should also test mediation models, such as whether reappraisal mediates the relationship between cognitive flexibility and PTG, or whether social support moderates the effect of suppression.

Conclusion

This expanded AJMHSS-formatted manuscript examined the role of cognitive flexibility and emotional regulation in predicting PTG among adult survivors of natural disasters. The integrated model suggests that flexible thinking and cognitive reappraisal are positive predictors of growth, while expressive suppression and emotion-regulation difficulties are negative predictors. These findings support the view that disaster recovery involves both cognitive reconstruction and emotional regulation. Interventions that strengthen flexibility, reappraisal, emotional awareness, culturally appropriate expression, and social support may help survivors move beyond survival toward meaning, connection, and renewed life priorities.

PTG should never be framed as an obligation imposed on survivors. Natural disasters involve real loss, injustice, grief, and disruption. However, when survivors are supported materially, socially, and psychologically, some may develop new strengths, deeper relationships, and transformed priorities. Understanding the cognitive and emotional predictors of this process can help researchers, clinicians, and policymakers design more humane and effective disaster recovery programs.

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Authors' Contributions

All authors contributed to data analysis, drafting, and revising of the paper and agreed to be responsible for all the aspects of this work.

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