

Experiences of Post-Traumatic Growth Following Earthquakes: A Qualitative Systematic Review

Daniel Andrei Popa^{1*}, Mihai Stefan Dumitrescu¹

¹Department of Management, Bucharest University of Economic Studies, Bucharest, Romania.

*E-mail ✉ daniel.popa.ase@gmail.com

Abstract

Earthquakes can cause multiple physical, psychological, and social consequences for those affected. Post-traumatic Growth (PTG) emerges when individuals attempt to rebuild and adapt their lives following a traumatic experience. This study seeks to highlight the significance of disaster psychology by reviewing and analyzing literature regarding PTG among earthquake survivors. A systematic review of qualitative studies published from January 1, 2012, to January 31, 2021, was conducted to investigate PTG in individuals who experienced earthquakes. Search terms including “Post-traumatic Growth,” “Earthquake,” and “Qualitative” were applied in the CINAHL, EMBASE, PubMed, PsycInfo, KISS, RISS, and NDSL databases. The initial search yielded 720 articles; removing duplicates left 318. Screening titles and abstracts removed 186 papers that did not meet the inclusion criteria. Upon full-text review of 132 articles, 65 were excluded due to irrelevance to the research focus. Of the remaining 67 studies, further filtering eliminated 25 quantitative papers, 19 non-original articles, 8 papers without PTG outcomes, 3 unrelated studies, 2 non-English publications, and 2 articles covering mixed topics, resulting in 8 final papers. PTG among earthquake survivors was categorized into three main domains: “Change in self-perception,” “Change in interpersonal relationships,” and “Spiritual change.” These were subdivided into eight subcategories: “Reviewing one's existence,” “Acceptance,” “Discovering strengths by working through adversity,” “Gratitude for life,” “Changes in personal relations,” “Changes in social relations,” “Accepting the existence of God,” and “A breakthrough to overcome difficulties.” These findings provide foundational evidence for understanding and supporting the psychological well-being of individuals recovering from earthquake-related trauma.

Keywords: Systematic review, Post-traumatic growth, Qualitative research, Earthquakes, Disaster

Introduction

Earthquakes are sudden, unpredictable events that occur without warning and are beyond human control [1]. Over the past year, 103 earthquakes have been reported in the New Caledonia Noumea area of the South Pacific, including one registering a magnitude of 7.9. In South Korea, 77 earthquakes with magnitudes above 2.0 occurred during the same period [2]. Earthquakes produce a range of physical, emotional, and social

effects. Physical outcomes include injuries of varying severity; emotional consequences encompass fear, anxiety, anger, and depression; social effects involve damage to infrastructure, communities, workplaces, and the environment [1]. These impacts can profoundly alter an individual's life [1, 3]. While earthquakes are unintended traumatic events causing suffering, they can also trigger recovery and personal growth [4].

PTG has been examined across different populations. In college students who experienced earthquakes, depression was identified as a factor influencing PTG [5]. Research on children exposed to natural disasters indicated that the degree of post-traumatic stress impacts PTG outcomes [6]. These findings suggest that emotional distress, including depression or post-traumatic stress, can act as catalysts for overcoming negative psychological effects. Childhood trauma has been linked

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to long-term mental health issues; approximately 20.7% of those affected reported psychotic-like experiences in adulthood, and 17.5% reported frequent delusions [7]. This indicates the enduring impact of early trauma on adult mental health and the necessity for therapeutic interventions. Protective factors such as personal resilience and depression, as well as social factors like household income and education, can positively influence responses to trauma [5-9].

According to the PTG model by Calhoun and Tedeschi [10], experiencing psychological distress and disruption of core beliefs are prerequisites for PTG. In other words, PTG is closely associated with negative psychological states, such as PTSD, whose primary symptoms include intrusion, avoidance, and hyperarousal [11]. Studies of terrorist survivors with PTSD showed that emotional numbing was linked to PTG after 6–12 months [12], indicating the need to examine various psychological effects caused by trauma. However, individuals may not always interpret trauma negatively; many strive to positively process traumatic experiences through resilience and goal-directed coping [10]. This highlights the ongoing importance of promoting constructive coping strategies.

Post-traumatic Growth (PTG) refers to the psychological improvement observed when an individual develops a deeper comprehension of the meaning behind traumatic events and begins to cultivate hope for the future [6, 13]. Research on PTG measurement tools has identified several dimensions, including personal strength, new opportunities, connecting with others, valuing life, and spiritual transformation [14, 15].

Repeated cognitive processing of the traumatic experience by the affected individual modifies thought patterns, and the negative emotions arising from the trauma serve as a driving force for moving beyond the event [3]. Consequently, individuals demonstrate a constructive perspective on themselves, their relationships, and life overall [16]. Through this process, survivors gain confidence in their personal capabilities and resilience [1, 17] and make conscious efforts to avoid returning to their pre-trauma state. They strive for a more fulfilling life by recognizing its meaning, adopting beneficial behaviors, and fostering positive changes such as eliminating harmful actions [3]. In this sense, PTG represents an intentional, constructive process through which individuals reorganize their lives toward independence and well-being [3, 18]. Understanding common patterns of growth among trauma survivors can

enable community health professionals to support recovery and help individuals overcome distress.

In this study, a systematic review of qualitative research was conducted to explore the PTG experiences of earthquake survivors. A phenomenological approach was employed to derive meaningful subjective interpretations, aiming to capture the positive psychological changes experienced by those affected. Moreover, the study seeks to promote a purposeful and meaningful life by identifying the significance of PTG in rebuilding one's life after trauma.

Materials and Methods

Study design

This research employs a systematic review methodology to collect previous studies and assess their quality, ensuring an accurate representation of the PTG experiences of earthquake survivors.

Research protocol

The goal of this study is to systematically examine qualitative studies investigating PTG among earthquake-experienced individuals. The CASP (Critical Appraisal Skills Program) qualitative research checklist was applied based on qualitative research evaluation protocols [19]. This checklist evaluates studies using ten structured criteria:

1. Clear statement of research objectives
2. Appropriateness of qualitative methodology
3. Study design
4. Recruitment strategy
5. Suitability of data collection methods
6. Researcher-participant relationship
7. Ethical considerations
8. Data analysis method
9. Clarity of results
10. Research significance

Literature search and selection

To identify qualitative studies on PTG among earthquake survivors, international databases (CINAHL, EMBASE, PubMed, PsycInfo) and domestic databases (KISS, RISS, NDSSL) were searched. MeSH terms were applied in foreign databases, extracting all terms including “Post-traumatic Growth,” “Earthquake,” and “Qualitative Research” as key search concepts.

Search strategies were adapted to the characteristics of each database. MeSH terms and text words were

combined using Boolean operators (AND/OR) and truncation to improve search specificity and sensitivity. For domestic databases, searches followed the international strategy but were adapted due to the absence of MeSH functions. Keywords included post-traumatic growth, earthquake, and qualitative research.

Inclusion criteria were:

1. Qualitative studies on PTG in earthquake survivors
2. Publications from January 1, 2012, to January 31, 2021
3. If duplication occurred between academic papers and theses, the academic paper was prioritized
4. Articles written in English or Korean

Exclusion criteria included:

1. Studies using terms similar to PTG (e.g., psychological adaptation, resilience)
2. Papers published outside the period of January 1, 2012, to January 31, 2021
3. Studies addressing natural disasters other than earthquakes (e.g., floods, forest fires)
4. Articles not published in English or Korean

The selection of literature in this study followed a structured process defined by inclusion and exclusion criteria, progressing through four stages: Identification → Screening → Eligibility → Inclusion. Initially, 720 records were identified from the database search. After removing 402 duplicates, 318 articles remained for further review. Two researchers independently assessed the titles and abstracts of these 318 studies, resulting in the preliminary selection of 132 papers, while 186 articles that did not satisfy the inclusion criteria were excluded.

The full texts of the 132 studies were then evaluated using the same criteria across three review meetings, leading to the exclusion of 65 papers that were not aligned with the study topic. This resulted in 67 articles for secondary analysis. Each of these 67 articles underwent two rounds of cross-checking to confirm their relevance. The final selection included 8 studies after eliminating 25 quantitative papers, 19 non-original articles, 8 studies unrelated to post-traumatic growth, 3 irrelevant papers, 2 non-English publications, and 2 studies covering mixed topics. The literature screening and selection were performed independently by two researchers, with disagreements resolved through discussion (**Figure 1**).

Data Collection

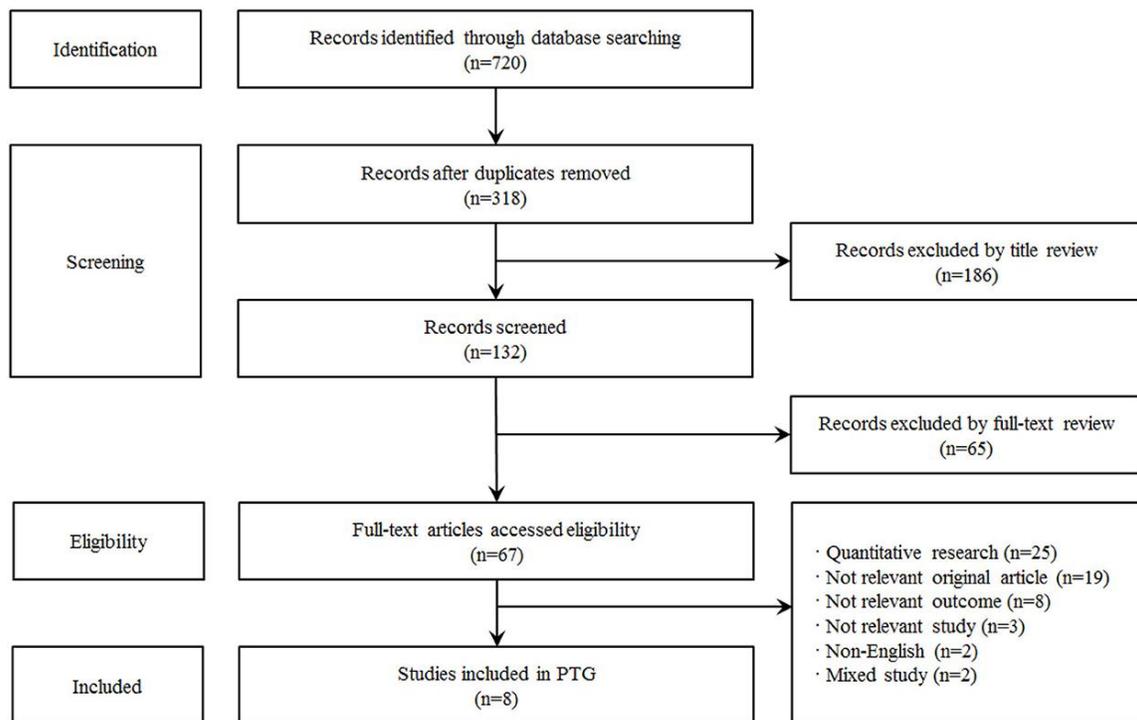


Figure 1. Flowchart depicting the selection of literature.

Ethical consideration

The study protocol was approved by the K University Institutional Review Board (IRB No: 1041459-202103-HR-004-01), ensuring that all literature use complied with research ethics standards

Results and Discussion

Quality assessment of the studies

The quality of the selected qualitative studies was assessed using the Critical Appraisal Skills Programme (CASP), a tool designed to improve the understanding and evaluation of qualitative research [20]. Each study was scored against 28 CASP items, with final scores ranging from 23 to 26, confirming their suitability for inclusion.

Specifically, two studies did not fulfill the criterion “Qualitative methodology for question?”, and two did not

address “Discussed saturation of data?” Five papers did not adequately examine the “Role, potential bias, and influence of the researcher during data collection?” highlighting the need for future studies to more explicitly manage bias. Additionally, two studies lacked “Details of how the research was explained to participants,” and two did not report “Approval from an ethics committee?” One paper did not provide an “In-depth description of the analysis process?” and one study lacked “Sufficient data to support the findings?” Six studies failed to account for “Contradictory data,” which was the most commonly unmet item, suggesting the need to minimize bias by explicitly addressing conflicting evidence. Finally, two papers did not cover “Evidence supporting and opposing research arguments?” or “Contribution to existing knowledge?” (Table 1). The systematic review was conducted according to the PRISMA guidelines [21].

Table 1. CASP quality assessment results.

CASP Checklist	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1. Is there a clearly stated aim for the study?	Y	Y	Y	Y	Y	Y	Y	Y
2. Does the research question suit a qualitative methodology?	Y	Y	Y	N	Y	N	Y	Y
3. Is the study design suitable for addressing the research objectives?	Y	Y	Y	Y	Y	Y	Y	Y
4a. Are the participant selection procedures clearly explained?	Y	Y	Y	Y	Y	Y	Y	Y
4b. Is it justified why the chosen participants were appropriate?	Y	Y	Y	Y	Y	Y	Y	Y
4c. Is the recruitment process discussed (e.g., reasons for non-participation)?	Y	Y	Y	Y	Y	Y	Y	Y
5a. Is the choice of data collection setting justified (e.g., interview, focus group)?	Y	Y	Y	Y	Y	Y	Y	Y
5b. Is the data collection process described clearly?	Y	Y	Y	Y	Y	Y	Y	Y
5c. Are the methods selected for data collection justified?	Y	Y	Y	Y	Y	Y	Y	Y
5d. Are the data collection techniques described explicitly?	Y	Y	Y	Y	Y	Y	Y	Y
5e. Is the form of the collected data clarified (e.g., recordings, notes)?	Y	Y	Y	Y	Y	Y	Y	Y
5f. Is data saturation discussed?	N	N	Y	Y	Y	Y	Y	Y
6a. Are potential biases or the researcher’s influence during data collection critically considered?	N	Y	N	N	N	Y	N	Y
7a. Are participants provided sufficient information about the research?	Y	Y	Y	Y	N	Y	N	N
7b. Are informed consent and confidentiality issues addressed?	Y	Y	Y	Y	N	Y	Y	Y

Female: 13							
5	Ren <i>et al.</i> [25]	China	45–90	23	25–62	Psychiatric specialists	Semi-structured interview
6	Iguchi <i>et al.</i> [26]	Japan	105–240	7	20s–50s	Public health nurse	In-depth interview
Male: 1							
Female: 6							
7	Pratt <i>et al.</i> [1]	New Zealand	Not reported	4	Teens	Senior students	Semi-structured interview
Male: 1							
Female: 3							
8	Wijoyo <i>et al.</i> [27]	Indonesia	45–60	14	21–56	Nurses	In-depth interview
Male: 7							
Female: 7							

Post-traumatic growth experiences of earthquake survivors

The eight studies were analyzed to categorize the PTG experiences of earthquake survivors. Findings were

organized into three primary categories and eight subcategories, representing common patterns of post-traumatic growth among the participants (**Table 3**).

Table 3. PTG categories and subcategories identified in earthquake survivors.

Category	Subcategory	Attribute
Change in self-perspective	Reviewing one's existence	Shift in life attitude (3)
		Recognition of personal limitations (5)
		Understanding life's meaning (4)
	Acceptance	Clarification of life's value (1)
		Awareness of life's uncertainties (5)
		Acceptance of pain and loss (6)
		Facing new challenges (1, 5, 2)
	Discovering strengths by working through adversity	Sense of pride (1)
		Adaptability/flexibility (7)
		Professional/occupational awareness (5)
Gratitude for life	Feeling fortunate to survive (1)	
	Memorable life experience (1)	
Change of interpersonal relationship	Changes in personal relations	Strengthened family bonds (6)
		Decrease in prejudices toward others (3)
		Empathy for others' suffering (2)
	Changes in social relations	Greater solidarity with coworkers (6)
		Enhanced community cohesion (6)
		Friendlier relations with neighbors (6)
Spiritual change	Accepting the existence of God	Viewing disaster as a step toward God (8)
		Broadened religious and spiritual perspective (7)
	A breakthrough to overcome difficulties	Experiencing the power of religion (5)
		A supportive refuge or anchor (3)

Change in self-perception

The first main theme observed in this study is the transformation of self-perception. Traumatized

individuals reassessed their surroundings and life priorities, leading them to reflect on the meaning of their existence. This process allowed earthquake survivors to recognize their inner resilience, accept their current circumstances, and overcome the challenges they had faced.

Reviewing one's existence

Some participants reported a significant shift in how they evaluated themselves after the earthquake. Previously, they considered themselves ordinary and inconsequential, but following the event, they became aware of their personal importance. They also realized the limits of human control when confronted with a natural disaster, prompting a reordering of their life priorities.

"Many things that seemed significant before the earthquake no longer hold the same value. The experience made me understand that I need to appreciate myself more and recognize my importance to others. I've lived for others, but now I want to live a meaningful life for myself because life is finite." [22, 24]

"My perception of the world shifted drastically. It is far less predictable and gentle than I thought; the ground beneath can move, and buildings can collapse without warning. The earthquake made me understand human fragility and limitations. I want to live a life with purpose because death is inevitable, and I must always be prepared." [3, 25]

Acceptance

Many participants came to terms with the reality that their environment was inherently unsafe. They recognized that life's unpredictability is a constant factor, and learning to accept this became part of their coping process.

"I try to view suffering as a natural part of life. Pain is something to carry with you, not something to escape. Life doesn't have easy answers. After the earthquake, I struggled with grief, especially for neighbors who were lost, but I reminded myself to be thankful that my family survived." [25, 26]

Discovering strengths through adversity

Several survivors reported that the earthquake highlighted human endurance rather than fragility. They discovered that their strengths extended beyond physical ability to include adaptability, confidence, and professional competence.

"Experiencing the earthquake encouraged a more positive mindset. Seeing the city rebuild and thinking about future possibilities gave me hope. I learned to face challenges and realized I am capable of overcoming obstacles." [1, 22, 23]

"Reflecting on how I responded to others during the earthquake helped me develop professionally and personally. Observing others recover from trauma showed me the importance of providing attentive support and not overlooking anyone's needs." [25, 26]

Gratitude for life

Post-trauma, many participants developed a deeper appreciation for life. Surviving the earthquake and witnessing the suffering of others prompted reflections on the value of existence.

"I survived without injury, and my home remained intact. Being with others who suffered made me realize the fragility and value of life. The earthquake was a powerful reminder to live with gratitude and awareness." [22, 23]

Change in interpersonal relationships

Another prominent theme was the positive shift in social interactions. Individuals who experienced PTG recognized the importance of building mutual support systems. They engaged more actively in caring for family, friends, and colleagues, demonstrating empathy and responsiveness to the needs of others.

Changes in personal relations

Some participants who experienced PTG after the earthquake reported notable transformations in their interpersonal relationships, which differed significantly from their pre-earthquake interactions.

"I became less judgmental toward others and my neighbors. Before, I held biases against people from other regions or religions, but after the earthquake, I focused on seeing their positive qualities. I realized that the suffering of others was also my suffering because the disaster affected everyone. Sharing the experience of the earthquake provided me with opportunities to feel hope, solidarity, learning, growth, as well as pain." [23, 24]

"The earthquake taught me many lessons. Previously, at work, I felt I was the only one putting in effort and questioned why my colleagues weren't working as hard. Later, I recognized that they were also giving their best. Surviving the disaster together created a sense of fellowship I hadn't experienced before. Before, I spent time at home without much responsibility, but now I help

my parents, cook for them, and realize that relationships with family, friends, and colleagues are what truly matter.” [3, 22, 26]

Changes in social relations

After experiencing PTG, participants often reported a changed perspective on social relationships. They felt stronger bonds with their communities and developed a greater sense of friendliness and cooperation with neighbors. The disaster fostered a culture of helping others, which strengthened social networks.

“After the earthquake, I felt closer to my neighbors, and the community seemed more united. The disaster encouraged a spirit of collaboration and mutual support. Additionally, I was able to work with professionals from other fields and help those who were in greater need than myself.” [24, 26]

“I started thinking beyond myself and my family and considered the needs of others. Following the earthquake, I reached out to people I had been distant from and encouraged them to participate in aid activities. I also connected frequently with local hospital nurses, assisting them in difficult situations. Previously, I had no contact with local organizations, but now I can support people in even more challenging circumstances.” [3, 26]

Spiritual change

The third major theme identified in the selected studies is spiritual change. For some earthquake survivors, the event led to a broadened spiritual perspective and a stronger connection with God. Surviving the disaster was often perceived as a sign of divine presence and protection.

Accepting the existence of god

For certain participants, the earthquake strengthened their religious faith, as they believed divine intervention contributed to their survival. They viewed the event as a step toward a closer relationship with God, experiencing religion as a tangible, existential presence rather than a purely metaphysical concept.

“After the disaster, I recognized that being alive was a gift from God. Observing how God works in our lives encouraged me to praise Him. The earthquake became a channel to deepen my connection with God, strengthening our relationship.” [1, 27]

A breakthrough to overcome difficulties

Participants with religious beliefs reported that their faith helped them cope with adversity more effectively.

Religion provided a framework to face challenges, including the awareness of mortality, and offered a source of resilience during and after the disaster.

“I feel the strength of my faith, which helps me overcome trauma. My religious beliefs have guided my life, and through faith, I can face difficulties. The influence of my parents and my religious upbringing helped me recover after the earthquake. Having faith gives me hope for Paradise as a reward for enduring hardships.” [24, 25]

This study employed a systematic phenomenological approach to explore PTG in individuals who had experienced earthquakes, analyzing the resulting categories and subcategories.

The subcategories of “Reviewing one’s existence” and “Acceptance” under the broader theme of “Change in self-perception” reflect how participants reevaluated their life perspectives and philosophies following the earthquake. Additionally, by identifying personal strengths during adversity and cultivating gratitude for life, participants transformed their painful experiences into sources of resilience. Consequently, the earthquake was not solely perceived as a negative event but also as an opportunity to appreciate life and recognize their survival.

Post-traumatic growth emerges from cognitive and emotional efforts to interpret natural disasters as meaningful events within the context of one’s challenging life. Fear during trauma prompts individuals to search for life’s meaning, and repetitive reflection on existential questions shifts toward pondering the purpose and significance of life. This process facilitates reconstruction of self-confidence and the formation of new beliefs [4].

Previous research indicates that experiencing a severe traumatic event can foster new insights and PTG through reflective rumination on the event’s significance and impact on one’s existence [23]. Ultimately, reflecting on life allows individuals to identify a constructive direction and cultivates hope and aspiration. This process does not represent a simple descent into psychological suffering but rather the positive integration of traumatic experiences into the individual’s understanding of life and purpose [27].

In this study, earthquake survivors accepted the event as an inevitable occurrence, appreciating the value of simply being alive and recognizing the disaster as a meaningful life experience. These findings align with previous research showing that gratitude (Factor V) was

statistically significant in studies on PTG assessment tools [28].

Specifically, “An appreciation for the value of my own life” scored 0.85 among gratitude-related factors and was strongly associated with PTG. Therefore, surviving an earthquake may serve as a catalyst for renewed existential appreciation.

What drives these positive responses? Not all individuals experience PTG after trauma; some develop post-traumatic stress instead. Prior studies show that survivors of traumatic events often experience internalized emotions such as guilt and self-blame, which can contribute to post-traumatic stress [29]. In the present study, participants also faced internal suppression, struggling to express fear, sadness, or shock at the loss of colleagues. However, PTG was still possible because human resilience manifested even amidst suffering. Strength was expressed through adaptability and confidence, consistent with prior findings indicating that internal strengths such as resilience and flexibility can foster PTG and help individuals overcome trauma [30]. Additionally, in the PTG tool study, the item “Knowing I can handle difficulties” within the personal strength factor (Factor III) scored 0.79, aligning with this study’s findings regarding the role of personal strength in facilitating PTG [28].

PTG and distress coexist in traumatic situations. Coping with pain and threats to life requires significant time and cognitive engagement. Through repeated reflection on traumatic experiences, individuals can derive positive psychological changes and a sense of life meaning. This process allows integration of new values, leading to a higher quality of life [31].

Regarding the second major theme, “Changes in interpersonal relationships”, earthquake survivors reported multiple alterations in personal and social dynamics. Participants showed reduced prejudice toward others with differing values and placed increased importance on family, friends, and colleagues. Community solidarity and cooperative social consciousness also strengthened, illustrating a broader enhancement of social bonds.

Some earthquake survivors reported that the suffering they endured during the disaster was shared among all those affected. This collective experience fostered a recognition that they were not living in isolation, strengthening feelings of solidarity and enhancing appreciation for family, friends, and colleagues. Consequently, during critical events such as natural

disasters, support is offered to trauma survivors with genuine concern. Through these meaningful relationships, individuals begin to understand the significance of life and develop deeper interpersonal connections. Specifically, receiving social support from significant relationships contributes to a shift in life philosophy, reorganizes one’s system of meaning, and facilitates more effective engagement in the cognitive and emotional processes that promote post-traumatic growth [4]. Previous research supports this observation, showing that discussing and sharing traumatic experiences with others enhances closeness and empathy toward others who are suffering [32]. Additionally, in the study by the developer of the PTG tool, the “A sense of closeness with others” item within the Relating to Others factor (Factor I) scored 0.81, reflecting its strong association with post-traumatic growth [28].

Through their earthquake experiences, participants acknowledged the importance of human relationships in ways not recognized prior to the disaster. The development of social networks and cohesion, different from pre-earthquake times, allowed survivors to reinterpret the meaning of the experience and perceive potential benefits arising from it. This reframing transforms the traumatic experience positively, strengthens relationships with others, and opens possibilities for new life experiences and psychological growth [33]. As a result, altered interpersonal relationships enabled survivors to discover new life meanings after trauma and cultivate a sense of purpose for rebuilding their lives [31].

Regarding spiritual change, the final key theme in this study, earthquake survivors reported shifts in their perception of God and the significance of religion. Following the disaster, participants often relied on religion to navigate challenges and sought divine guidance to address problems beyond their control. Survivors viewed their survival as evidence of a connection with God, reporting that the experience strengthened their spiritual bond. Through this process, they became more certain of God’s existence and experienced shifts in spiritual emotions. Prior studies indicate that spirituality is a key factor influencing post-traumatic growth. Traumatic events prompt individuals to question spiritual beliefs, and survivors often interpret occurrences as manifestations of God’s will. Acceptance of the disaster and one’s relationship with God can promote PTG [28, 34].

Because humans possess interconnected physical, psychological, social, and spiritual dimensions, understanding trauma comprehensively requires incorporating spirituality. Traumatic events not only threaten physical, psychological, and social well-being but also profoundly affect spiritual health [35–37]. Prior studies similarly report that trauma survivors employ spirituality to cope during crises, which helps them positively overcome challenges through their faith [36, 37].

Religion and spirituality influence how individuals perceive life events, evaluate traumatic experiences, and select coping strategies. Positive religious or spiritual coping strategies include establishing secure connections with God, self, and others through [1] finding meaning, [2] gaining mastery and control, [3] seeking comfort and intimacy with God, [4] increasing closeness with others and God, and [5] achieving transformative life changes [35]. In contrast, negative religious coping methods, which involve conflicts with God, self, or others, can exacerbate trauma rather than alleviate it [38, 39].

Earthquake survivors often interpreted their experiences as manifestations of God's will, "for good reason," or as opportunities for spiritual growth. They perceived trauma as a spiritual challenge or test and sought collaboration with God to navigate difficulties. This approach enabled them to gain control over disasters, discover new life meanings, and develop a sense of purpose in life after trauma [35]. These findings align with prior research showing that the Spiritual Change factor (Factor I) was statistically significant in PTG tool studies [28]. Specifically, "A better understanding of spiritual matters" scored 0.84, representing the item most closely associated with post-traumatic growth.

As a result of this study, the experiences of post-traumatic growth among earthquake survivors encompassed changes in self-perception, interpersonal relationships, and spiritual transformation, which align with the five dimensions of Tedeschi and Calhoun's PTG tool: new possibilities, personal strength, relating to others, spiritual change, and appreciation of life [28]. When individuals face disasters like earthquakes, they confront harsh realities and challenges, and often discover inner resilience, reinforcing their belief in their own strength.

Through establishing new connections and deepening relationships with others, participants realized the centrality of their own lives and rediscovered the meaning of life after trauma. Daily gratitude for

surviving and renewed religious or spiritual beliefs facilitated spiritual growth, ultimately fostering a more positive approach to life.

While PTG research has expanded and the PTG tool has been validated using diverse populations, the factor structure has been observed to vary across countries, and some items were not effective in measuring culture-specific post-traumatic growth [40]. Therefore, to address the limitation that qualitative research cannot fully quantify PTG, future studies should consider demographic and cultural variables. Integrating qualitative research findings can help refine and enhance the PTG tool through more nuanced and practical analyses.

Limitations and future directions

This study has several limitations. The papers analyzed focused specifically on subjects who experienced earthquakes, a particular type of natural disaster. Consequently, the findings cannot fully represent PTG among survivors of other types of disasters. Additionally, due to the specialized topic, the number of published studies was limited, and most originated from regions where earthquakes occur frequently. Despite these limitations, the study is valuable for understanding the real-world experiences of earthquake survivors by synthesizing qualitative research on PTG.

The findings can serve as foundational data for developing psychological intervention programs in earthquake-prone areas. While systematic literature reviews have largely concentrated on quantitative studies, qualitative research remains underrepresented. Unlike quantitative studies, which provide guidelines for document evaluation and data extraction, qualitative studies lack standardized tools. Future research should focus on developing comprehensive evaluation methods for qualitative research.

Conclusion

This study systematically reviewed published qualitative studies exploring PTG among earthquake survivors and categorized the various manifestations and meanings of PTG. It was found that PTG encompasses changes in self-perception, interpersonal relationships, and spiritual beliefs. Survivors reflected on their existence rather than solely attempting to avoid pain, which led to an increased appreciation of life and the ability to overcome adversity.

Participants also emphasized the importance of human relationships, experiencing a strengthened sense of solidarity. Moreover, some reported spiritual changes, including a deeper understanding of religion and affirmation of God's existence.

Through traumatic experiences, survivors re-evaluated their life values, discovering new meaning and promoting growth in areas such as personal strength, social relationships, gratitude, and spirituality. Community health professionals should recognize that PTG results from cognitive and emotional efforts to redefine life and provide opportunities for survivors to identify new forms of meaning. Additionally, interventions should aim to enhance life satisfaction by fostering or refining survivors' sense of purpose.

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