Received Date: 03 December 2022 I Accepted Date: 23 January 2023

OPUS Journal of Society Research

RESEARCH ARTICLE

Voluntary Search-and-Rescue Workers' Experiences After Witnessing Trauma in the Earthquake Field

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January 2023
Volume:20
Issue:51
DOI: 10.26466//opusjsr.1214128

Citation:
Köse, A. (2023). Voluntary search-and-rescue workers' experiences after witnessing trauma in the earthquake field. *OPUS– Journal of Society Research, 20*(51), 56-66.

Abstract

Turkey has an earthquake-prone geography, and as in Turkey, when professional resources are not sufficiently available in a community hit by a disaster, volunteer search-and-rescue workers' help is crucial for quickly meeting disaster-area needs. However, few studies focus on volunteer search-and-rescuer's post-traumatic reactions although trauma literature has grown regarding professional search-and-rescue teams' post-traumatic responses. Based on this gap in the literature, this study was conducted. This qualitative study provides an in-depth understanding of secondary trauma and vicarious post-traumatic growth among 13 search-and-rescue team workers involved in disaster relief activities following the 2020 Izmir earthquake in Turkey. Data were collected through semi-structured interviews, and an interpretive phenomenological approach was used. The findings revealed that the participants suffered secondary traumatic stress symptoms, namely, hyperarousal, intrusive images, and thoughts but experienced vicarious post-traumatic growth in discovering personal strength, relating to others, appreciating life, and striving to do their job better. This study's findings can be a source for developing psychosocial post-disaster support services and interventions for volunteers and be used to improve pre-field preparation training content for voluntary search-and-rescue teams. The findings also underlined the fact that focusing on facilitating vicarious post-traumatic growth is as crucial as overcoming voluntary search-and-rescue workers' post-traumatic stress.

Keywords: *Secondary Traumatic Stress, Vicarious Post-Traumatic Growth, Volunteer Search-And-Rescue Teams, Earthquake, Trauma.*

Öz

Türkiye depreme eğilimli bir coğrafyaya sahiptir ve Türkiye'de olduğu gibi, bir afet karşısında, profesyonel kaynakların yeterince bulunmadığı durumlarda, afet bölgesi ihtiyaçlarının hızlı bir şekilde karşılanması için gönüllü arama kurtarma çalışanlarının yardımı çok önemlidir. Ancak, profesyonel arama ve kurtarma ekiplerinin travma sonrası tepkilerine ilişkin literatür artmasına rağmen, az sayıda çalışma gönüllü arama kurtarma ekiplerinin travma sonrası tepkilerine odaklanmaktadır. Literatürdeki söz konusu boşluktan yola çıkarak bu çalışma yapılmıştır. Bu nitel çalışma, Türkiye'de 2020 İzmir depremi sonrasında afet yardımı faaliyetlerinde yer alan 13 arama kurtarma ekibi çalışanın ikincil travma ve ikincil travma sonrası büyüme deneyimleriyle ilgili derinlemesine yapılan bir incelemenin sonuçlarını sunmaktadır. Veri, yarı yapılandırılmış görüşmeler yoluyla toplanmış ve veri analizinde, yorumlayıcı fenomenolojik yaklaşım kullanılmıştır. Bulgular, katılımcıların ikincil travmatik stres semptomları gösterdiklerini ortaya koymuştur. Bu semptomlar arasında aşırı uyarılma, davetsiz imgelemler ve düşünceler bulunmaktadır. Ancak buna karşın, kişisel gücü keşfetme, başkalarıyla ilişki kurma, yaşamın değerini anlama ve işlerini daha iyi yapmaya çabalama konularında ikincil travma sonrası büyüme yaşadıklarını ortaya koydu. Bu çalışmanın bulguları iki amaç için kullanılabilir. Birincisi, gönüllü arama kurtarma ekiplerine yönelik afet sonrası psikososyal destek hizmetleri ve müdahaleleri geliştirmek için bir kaynak olabilir. İkincisi, saha öncesi hazırlık eğitim içeriğini iyileştirmek için kullanılabilir. Bulgular, gönüllü arama kurtarma çalışanlarının travma sonrası stress tepkilerinin üstesinden gelmeye odaklanmak kadar, travma sonrası büyümeyi kolaylaştırmaya odaklanmanın da önemli olduğunun altını çizmiştir.

Anahtar Kelimeler: *Ikincil Travmatik Stres, Ikincil Travma Sonrası Büyüme, Gönüllü Arama Kurtarma Ekipleri, Deprem, Travma.*

Introduction

An earthquake hit İzmir, Turkey, on October 20, 2020. From that moment, voluntary search-and-rescue teams actively worked in the field. They witnessed victims' death and suffering while providing aid. Trauma studies have revealed that individuals who witness trauma may experience secondary trauma, which may also result in vicarious post-traumatic growth (VPTG).

This study investigated secondary trauma and VPTG among voluntary search-and-rescue workers involved in disaster relief activities a year following the İzmir earthquake. It was carried out one year later because this allowed long-term observation of traces of VPTG. Moreover, it was possible to determine whether post-traumatic stress symptoms and the need for psychological support persist even one year later.

There is a growing number of studies about the post-traumatic reactions of professional aid givers working in disaster fields; however, there is only a little research on volunteers. Since the post-traumatic reactions of voluntary search-and-rescuers are under-research, this present study can contribute to this gap in the literature. Besides, the study's findings may be used to develop psychosocial post-disaster support services and interventions for volunteers and pre-field preparation training content for them.

Secondary Traumatic Stress (STS) and Vicarious Post-traumatic Growth (VPTG)

Secondary traumatic stress (STS) describes post-traumatic stress response like symptoms in individuals who work directly in disaster areas with trauma survivors (Figley, 1995). Although trauma responders are not directly impacted by the traumatizing event, because of witnessing the suffering of others, they may develop symptoms similar to post-traumatic stress disorder (PTSD), such as flashbacks or intrusive imagery, hyperarousal, and avoidance behaviors (Tedeschi et al., 2018). STS negatively affects the well-being of individuals. Although many post-traumatic reactions are considered normal following a traumatic event, symptoms persisting beyond one month despite the traumatic event ending may cause impairment in intimate and social relationships, physical health, and occupational or other significant areas of a person's life (Guo et al., 2004; Nsenga, 2020). Therefore, secondary traumatic stress should be tracked after a traumatic event and intervened with if it persists over time to prevent negative consequences.

Most studies on secondary traumatic stress reactions after a traumatic event focus on professional rescue workers; few have been conducted on volunteers (e.g., Guo et al., 2004; Hagh-Shenas et al., 2005; Thormar et al., 2010; Haraldsdóttir et al., 2014; Setti et al., 2016; Sifaki-Pistolla et al., 2016). These studies concluded that voluntary search-and-rescue responders are more disadvantaged than professionally trained traditional disaster first responders regarding training, professional support, work and life experiences, and disaster field working conditions. Consequently, they are more vulnerable to secondary trauma than professionally trained disaster responders.

Secondary trauma does not always result in negative outcomes. "Post-traumatic growth" is used to describe the positive changes in trauma survivors' lives after a traumatic event. Positive changes in the individual following indirect trauma exposure are called "vicarious post-traumatic growth (VPTG)," while those as a result of direct exposure to trauma are called "post-traumatic growth (PTG)" (Yaakubov et al., 2020).

Tedeschi and Calhoun (1996) define post-traumatic growth as positive psychological changes experienced because of a struggle with traumatic or highly challenging life circumstances. Tedeschi et al. (2018) highlighted that trauma itself does not lead to PTG; rather, it affects individuals' schemas. Traumatic life events shatter peoples' assumptions and challenge what they believe to be true about their lives. PTG usually occurs through the rebuilding of these beliefs and manifests itself in different areas: increased personal strength, realizing one's own potential for new possibilities, appreciating life, relating to others, and spiritual changes. Positive changes are not necessarily expected in all of these areas; growth can occur in one, several, or all of them and in various forms

(emotional, behavioral, cognitive, and biological; Tedeschi et al., 2018). Tedeschi and Calhoun (2018) stated that the outcomes of post-traumatic growth also apply to VPTG; however, Cohen and Collens (2013) stated that there are two other specific dimensions: striving to do one's job better and being more involved in social justice issues.

The type of trauma that a person witnessed may lead to different VPTG patterns. For example, while health-related traumas such as disability or illness may lead to enhanced appreciation of the body and participation in health-promoting activities (Hefferon, 2013; Walsh et al., 2018; Maguire and Maguire, 2020), losing a family member might result in increased VPTG in appreciating life (Shakespeare-Finch & Armstrong, 2010; Asgari and Naghavi, 2020).

Studies have analyzed the VPTG of professionals involved in earthquake disaster relief activities, such as mental health clinicians, professional search-and-rescue teams, and nurses. This literature review revealed no studies investigating the VPTG of volunteer search-and-rescue workers working in an earthquake zone.

This Study

This study's primary purpose was to understand how volunteer search-and-rescue workers participating in Izmir earthquake disaster relief activities understand these traumatic experiences' impact on their lives one year later. Therefore, the primary question this study aimed to answer was "In what ways has participating in disaster relief activities after the 2020 Izmir earthquake affected volunteer search-and-rescue workers' lives in terms of post-traumatic reactions?"

Turkey has an earthquake-prone geography, and earthquakes are the second most common disaster. As in Turkey, when professional resources are not sufficiently available in a community hit by a disaster, volunteer search-and-rescue workers' help is crucial for quickly meeting disaster-area needs (Þormar, 2015). However, the concept of the post-traumatic reactions of aid givers working in disaster fields is relatively new in the literature, and the experiences of volunteers who participated in search-and-rescue efforts after witnessing such a trauma are neglected and under-researched (Fraser, 2020).

This study's findings can contribute to this gap in the literature, be a source for the development of psychosocial post-disaster support services and interventions for volunteers and be used to improve pre-field preparation training content for voluntary search-and-rescue teams. Furthermore, researchers have indicated that differing trauma types may lead to different vicarious versions of PTG. Therefore, investigating the VPTG concept in the context of volunteer search-and-rescue teams will enrich the literature in terms of understanding the relationship between trauma types and vicarious post-traumatic outcomes.

Research Methodology

This study employed an interpretive phenomenological approach (IPA) because this is among the best ways to delve deeply into challenging, emotionally charged experiences in people's lives (Merriam and Tisdell, 2009). IPA is thus in line with the trauma focus of this study.

IPA is committed to phenomenology, hermeneutics, and idiographic paradigms (Pietkiewicz & Smith, 2014). According to phenomenology, participants are experts in the phenomenon under investigation; therefore, its focus is their lived experience, perceptions, and interpretations and how they make sense of the phenomena under study (Rossman & Rallis, 2016). The second theoretical orientation of IPA is hermeneutics, which is intended to illuminate details and seemingly insignificant aspects of experiences that can be minimized in participants' lives (Laverty, 2003). Traumatic life experiences are often difficult for the survivor to name or make sense of. Therefore, the hermeneutic approach was essential in this study to make the invisible meaning of the participants' words visible. IPA's final theoretical orientation is idiography (Pietkiewicz & Smith, 2014; Shinebourne, 2011). The idiographic approach focuses on in-depth examination of participants' unique experiences before arriving at general conclusions (Pietkiewicz

& Smith, 2014). As in this study, the researcher codes and analyzes the participants' lived experiences ideographically and then closely examines each case's specific features, analyzing the similarities and differences among cases before reaching synthesis.

Participants

The participants included nine men and four women aged 20–28 years. All participants were university students and members of the search-and-rescue club at a foundation university in Istanbul. All participants reported that before the 2020 Izmir earthquake, they performed a search-and-rescue response in a collapsed building in Istanbul and sometimes worked as lifeguards as part of the club's work. They received search-and-rescue training during university club activities. Five participants were in İzmir when the earthquake struck and reached the disaster area immediately afterward; the other eight arrived at the disaster area 7 hours after the earthquake. The entire team worked in the area for three days.

Data Collection Procedure

This study was approved by Yeditepe University's ethics committee (No. 21/2021). All participants provided oral and written informed consent. Announcements and information regarding this study were obtained by reaching out to the search-and-rescue team's social media accounts. Interviews lasting 45–60 minutes were held online with the participants in October 2021. Each interview was audio-recorded and then transcribed verbatim by the researcher.

Two questions were posed to the participants to capture their lived experiences:

1. What have you experienced after your work in the disaster area as a search-and-rescue worker? How did you experience it (if anything)? Has it changed over time?
2. Have you experienced any changes, positive or negative, regarding your relationships, your understanding of life and yourself, your spirituality, your life goals, and your volunteerism that you can relate to your experience? (Probe separately for each if not offered.)

Data Analysis

The interviews were analyzed using inductive thematic analysis, for which Braun and Clarke's (2006) six-phase data-driven procedure was followed. First, the researcher transcribed the interview recordings to improve data familiarization. Second, initial coding was performed, which allowed the researcher to form the raw data into more meaningful insights. Third, the initial codes were grouped according to shared features. Candidate themes emerged, which were then systematically refined based on their deeper relationships to create a thematic map. At the second, third, and fourth data analysis stages, validity checks were carried out by a colleague who is experienced in coding qualitative data and trauma studies to ensure consistency and agreement regarding the themes. The themes and categories were then defined and named. Finally, the process ended with the reporting of the findings.

Existing research was used to inform the inductive thematic analysis findings rather than to drive the analysis itself. Inductively generated themes were examined against existing theories regarding post-traumatic reactions; therefore, a systematic dialogue between the two became possible. This cyclical process between inductive themes generated and existing theoretical dimensions of post-traumatic reactions revealed in the trauma literature allowed the researcher to infer the best explanation of the phenomenon under study. Member checking was also employed in this study to ensure trustworthiness (Merriam and Tisdell, 2009). MAXQDA 12 was used to store and code the data.

Findings

The data analysis identified two themes, six categories, and three subcategories (See Figure 1). The themes were (a) secondary traumatic stress and (b) vicarious PTG. Two categories emerged for secondary traumatic stress: hyperarousal and

intrusive images and thoughts. Hyperarousal was divided into three subcategories: exaggerated startle response and physiological reactivity to environmental cues, hypervigilance, and panic attacks. The analysis suggested four categories representing participants' VPTG following search-and-rescue work: (1) discovering personal strength, (2) relating to others, (4) appreciating life, and (4) striving to do one's job better. These findings are described below with illustrative quotes from participants. The researcher removed all identifiers to preserve anonymity.

Secondary Traumatic Stress

Hyperarousal: Eight out of 13 participants reported mild-to-severe hyperarousal symptoms shortly after their work in the earthquake field ended. These symptoms manifest as an exaggerated startle response and physiological reactivity to environmental cues, hypervigilance, and panic attacks. Only symptoms that persisted for more than one month were considered for analysis.

Exaggerated startle response and physiological reactivity to environmental cues. Of the 13 participants, seven reported one form of hyperarousal symptoms: an exaggerated startle response and physiological reactivity to environmental cues. These symptoms manifested as a strong, instantaneous body reaction, increased heart rate, agitation, being easily scared, and panic reactions. For example, one participant said,

Whenever I sense shaking or earthquake news comes from my phone, fear comes. I start to get scared again. My heart starts beating fast.

Another quotation below reflected how participants' bodies become highly alerts at the slightest reminder of earthquake shaking, despite that there is no real danger.

I became afraid of tiny things. For example, my girlfriend brings food. She has a frying pan in her hand; the handle of the pan touches the plastic bag, and the rustling sound of the bag suddenly accelerates my pulse. It took so long, months. It was so bad.

The participants stated that they did not experience their fear that any movement was shaking that indicated an earthquake as severely as in the beginning. For some, it disappeared over time; for others, though it continued, its frequency and strength decreased:

For months, I was hypersensitive. If the chair was shaking, I would jump up. It's past now; frankly, I don't care much when the seat shakes.

Hypervigilance. Five of the 13 participants reported a state of hypervigilance, which manifested itself as scanning their environment and searching for anything that could pose any danger.

I was constantly watching my environment, scanning around like where I can escape or help people in case of an earthquake, I didn't get on the subway for a while because you are underground and elicits my bad memories. But, of course, this has decreased over time.

As the quotation below reflects, participants excessively scan potential dangers in their surroundings, especially anything associated with earthquakes, such as building durability, or assess potential threats and attempt to make hypothetical plans to protect themselves.

While walking outside, I look at the length of the buildings to see where I can run if there is an earthquake, or I try to calculate where the collapsed place ends when it falls to the side to protect myself. This was more frequent until 2-3 months ago. Nowadays, if I'm not in a hurry, I walk by looking at the buildings and thinking about this.

Except for two participants who still suffered from panic attacks, the rest stated that they did not experience a state of hypervigilance as often as in the past.

Panic attacks. Three of the 13 participants reported panic attacks triggered by reminders of the earthquake months after their work in the earthquake disaster area. One participant sought professional help to overcome the attacks because their frequency and power increased over time; he explains his situation as follows:

Panic attacks started 2.5 months after the earthquake and continued for almost 8 months. It was usually triggered by my arguments with my family or girlfriend. After the earthquake, I was terrified of losing them. For this reason, I did not want to argue with them, and when I did, panic attacks recurred quite often.

The second participant still suffered from claustrophobia and remained cautious of being in small or tight spaces. However, as she stated, her claustrophobia eventually led to *panic attacks* and still negatively affected her life.

In my dreams, I have started to see scenes of demolished buildings that I was stuck in. After that came claustrophobia. The claustrophobia and bad dreams still persist. However, it began to go beyond claustrophobia. For example, when I am stressed or excited about something, I start to panic, and it feels like I can't breathe. I was not a panicked person before.

A third participant stated that although his panic attack has not recurred, he is always on guard and avoids environments that he thinks will trigger a panic attack.

One day, I woke up suddenly in the night in extreme panic and said, "The place is very weak and may be demolished." At that moment, the people in the wreckage came to my eye. Afterward, the panic attack did not recur, but I don't go into old buildings or narrow spaces anymore.

Intrusive Images and Thoughts: Data analysis revealed that in the immediate aftermath of their work in the earthquake field, nine participants suffered from intrusive images and thoughts, and for five, intrusive images and thoughts disturbed them for a long time, a defining symptom of VT. Currently, except for one participant who still suffers from nightmares, the participants' intrusions have decreased in intensity or disappeared.

The lifeless bodies I saw there did not affect me, but the remains of their lives and dreams did not go away for months. I was aware that death is a part of our life, but I could not have guessed that it was so sudden. That's why the items that remind me of victims' unfinished dreams stuck in my mind.

One of the participants explained how his cognitive framework regarding despair shattered from the things he had witnessed in the debris and caused him intrusive rumination:

Even finding the lifeless body of one of his family, while hopes were fading, made people happy. Can a person be happy even to have the dead body of a relative? It was there that I first met what despair truly means. I couldn't process it for a long time, both emotionally and cognitively.

Vicarious Post-traumatic Growth

***Discovering Personal Strength*:** Of the 13 participants, seven reported a new sense of strength. For example, one participant described how she discovered her physical capabilities and endurance amid physical challenges.

People close to me always tell me that you are tiny, petit, do not lift heavy, do not carry shopping bags, you get tired, get sick, etc. I didn't shower there for a week; I didn't eat enough; I did heavy work for hours in harmful conditions. Then, something like this happened to me: You know, I am okay. Put me in the worst environment in the world right now. I can adapt even there.

Another participant described discovering his sense of confidence in his soft skills, showing how an inference made from a traumatic experience can be transferred to other areas of life.

I did not know that I could work in such a disciplined and coordinated way until I participated in the earthquake rescue efforts. It was there that I realized that I had such skills. Before that, I would consider myself a more laid-back and easily bored person. Now, when I get bored with classes, I always remind myself of this.

Finally, another participant spoke about his improved psychological capacity to handle emotionally heavy situations.

It felt like I couldn't handle what I saw psychologically. But I made it. I witnessed what, normally, people wouldn't want to see; I've done things they wouldn't want to do. So, I can say that I feel much stronger psychologically.

These excerpts are also excellent examples of how a discovery of personal strength because of one's work might positively shape one's self-concept.

***Relating to Others*:** Of the 13 participants, six described positive changes in their relationships with others after witnessing people's sudden death and the pain of those who suddenly lost their loved ones due to the earthquake. As shown in the quotations above, the participants particularly emphasized themes such as "there is no guarantee

of tomorrow" and "today may be our or our loved ones' last day in this life." This is seen as the basis for changing the way they relate to people in a more positive manner. One participant said,

I never get it out of my mind that "right now, I may lose the person next to me the next day, he or she may die, I may die too." I had such a feeling after the earthquake. I don't want to break anybody's heart. I always leave loved ones saying I love you since then.

The quote above shows how she prefers to show her love and attention to people without delay.

In the past, when I liked someone's clothing, work, or way of speaking, I wouldn't compliment it. But now, even to a passer-by, I say my compliment without thinking about who will say what. Maybe this person will not hear this tomorrow because we can't guarantee other days.

Finally, another participant explained that he preferred to be constructive in his relationships after his experiences in the earthquake field:

Death can come at any time. This fact hit me like a slap in the face, which carried me to a different place in my relationships. Let's say I had an argument with a friend; I'm trying to wrap things up quickly, even though I know my friend is wrong. For me, friendship is more important than being right now.

***Appreciating Life*:** Three of the 13 participants said that as a result of witnessing death, they enjoy life more, are grateful for every day that they breathe healthily, worry less about minor problems, and make choices that do not delay their wishes. For example, one participant explained that becoming aware of mortality made him more appreciative of the breaths he takes and that he does not miss out on opportunities to experience more joy in life:

We can die suddenly. Witnessing the young people die showed this notion clearly. This leads me to be grateful for and enjoy my life more. For example, I was lazy about meeting my friends, but now I say to myself, "Go and have some fun while you are alive."

Another participant stated that while making his decisions in life, he considered that death could come suddenly; thus, he decided not to postpone his wishes in life:

I realized that death is close to human life. Since then, I live by considering this fact as much as possible. There was a girl I had liked since high school. I couldn't open up to her for years. However, after witnessing the death of young people there, I decided to open up to her.

Another participant stated that she gained the perspective that it is meaningless to raise small problems in the face of life's brevity:

Something like noticing and accepting death a little more happened to me. When something bad happens, I say, "Oh, life is short, we are still breathing, we can overcome the problems."

***Striving to do one's job better*:** Nine of the 13 participants stated that they took their volunteer activities much more seriously after their work in the earthquake area, and their internal motivation to improve themselves in search-and-rescue efforts increased. When we look closely at the statements of the participants on this subject, the biggest source of this motivation appears to be the satisfaction they feel from being able to touch human life and concretely witness their personal contributions to easing the suffering and pain of earthquake victims. One participant stated,

I realized that I could save a life. I can't tell you what a wonderful feeling it is. For this reason, I aimed to keep my information up-to-date in the case of a possible future disaster. Additionally, physical strength is important in search and rescue; I do sports more regularly than before to stay physically strong.

The participants also reflect on situations in which they were deficient in their earthquake search-and-rescue activities and took action to improve themselves in areas where they felt they were insufficient:

I often think about how I can better benefit people if there is another earthquake. In the field, I felt that I was lacking in providing psychological support to victims. That's why I'm going to take a course on psychological first aid.

One participant stated that his approach to the importance of taking his job seriously changed significantly and his view that this seriousness should exist in all areas of life, not just search and rescue, was shaped by his work in the earthquake field.

When I saw the destruction of families there, I questioned life for a long time. After that, I realized that I should do everything I do with more seriousness and care because when these destroyed buildings were first built, if the responsible people had taken their jobs seriously, perhaps this would not have been the result. Now I show this seriousness even when cooking pasta.

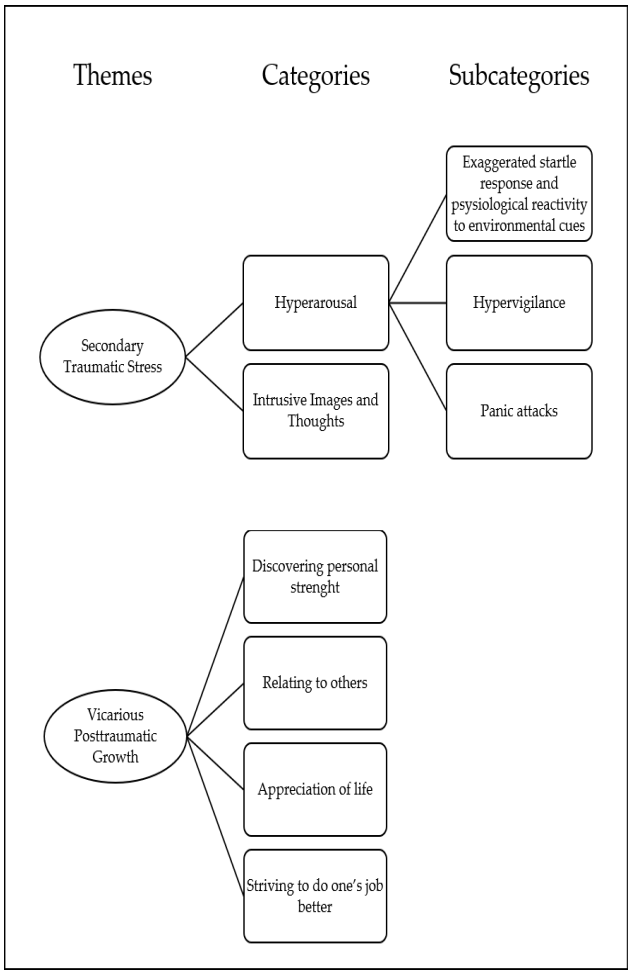

Figure 1. Visual Depiction of Themes, Categories, and Subcategories

Discussion

This qualitative study explored the lived experiences of young voluntary search-and-rescue responders who were members of a university's search-and-rescue club a year after the 2020 Izmir earthquake in Turkey. This study's first goal was to investigate the post-traumatic stress symptoms of 13 volunteers and examine whether their symptoms persisted after one year. Data analysis revealed that volunteers suffered from mild-to-severe hyperarousal symptoms and intrusive images and thoughts.

The participants' hyperarousal reactions manifested as physiological reactivity to environmental cues, hypervigilance, and panic attacks. The findings demonstrated that the participants' fight-or-flight response was activated after their disaster area work, which put them in a state of constant tension. For some, these symptoms faded over time and no longer negatively impacted their life; however, for three, because their symptom severity increased proportionally over time, they sought professional help to overcome the issue. Two were still suffering from the negative consequences of their traumatic experience, which eventually led to a constant state of avoidance of reminders of the disaster field and panic attacks.

These findings align with the existing literature and support the notion that working in disaster areas carries the risk of secondary trauma for volunteer search-and-rescue responders (Sifaki-Pistolla et al., 2016; Hagh-Shenas et al., 2005; Guo et al., 2004). There is agreement in trauma literature that secondary trauma reactions are part of natural recovery processes; however, if they persist, they can become problematic. As previously mentioned, for some participants in this study, some post-trauma symptoms persisted over time and negatively affected their lives.

This study also explored the voluntary search-and-rescue responders' personal growth one year after their work. The positive transformations participants reported align with the PTG domains suggested by Tedeschi and Calhoun (2018), who argued that positive transformations after witnessing a traumatic event can occur in five domains: (1) increased personal strength; (2) realizing one's own potential for new possibilities; (3) appreciating life; (4) relating to others, and (5) spiritual change. This study's findings demonstrated that participants had a newfound sense of strength, which then led to an improved sense of confidence and self-concept, positive changes in their relationships with others, and greater appreciation of life. The areas of relating to others and spiritual change did not emerge as subthemes in this study. Moreover, the

participants stated that after this experience, they took their work more seriously and put forth special effort to improve themselves. This finding is consistent with Cohen and Collens' (2013) arguments regarding VPTG. According to Cohen and Collens (2013), in addition to the areas mentioned by Tedeschi and Calhoun (2018), VPTG has two special dimensions: striving to do one's job better and being more involved in social justice issues. This study did not indicate that participants were more involved in social justice issues.

After their work in the disaster field, the participants also discovered a stronger side to themselves. As stated by Haraldsdóttir et al. (2014), volunteer search-and-rescue workers are typically the first to arrive to the disaster area, carry out the initial organization in the field without the help of professionals, and concretely observe the importance of their personal contributions to improve the situation therefore these attributes contributed to their perception of their self-efficacy and self-worth. Haraldsdóttir et al.'s (2014) argument is also reflected by this study's participants.

Positive changes in relationships with others and a greater appreciation of life are the other vicarious PTG domains that emerged from our data. First, these participants experienced the earthquake survivors' pain of the sudden loss of their loved ones. Witnessing this was a significant life experience faced by these young people: the fact that one can lose precious people in one's life instantly. Appreciating the moments they spent with their loved ones, developing meaningful relationships, and not prolonging tense moments were important changes that participants made in their relationships. Second, the participants removed dead bodies from under the earthquake debris, thus facing the inevitable reality of untimely death. This reality has led them to enjoy life more, be grateful for every day that they breathe healthily, worry less about minor problems, and make choices that do not delay their wishes. As reported by Tedeschi et al. (2020), "When a person confronts loss, whether it be real (death of a loved one) or imagined (fear that a spouse is being unfaithful), it causes him or her to consider how precious and fleeting life can be. This in turn leads to a new way of looking at one's priorities and what it means to fully embrace life and what it has to offer."

Based on the findings presented above, I offer the following suggestions: First, there should be space in volunteer work and rescue organizations to be vulnerable. It is essential to understand that secondary traumatic stress is a normal reaction to such situations and that sometimes people need time to process the tragic events they have witnessed. Keenan et al. (2009) argued that psychoeducation for first responders is effective in normalizing post-traumatic reactions, particularly when this type of education is provided by a peer. Teaching and practicing personal self-care strategies can also be part of volunteer search-and-rescue training. Barrington and Shakespeare-Finch (2014) offered mindfulness meditation, regular exercise, healthy eating, connecting with nature, and developing self-awareness (p.1696) as personal self-care strategies to foster resilience and overcome the negative effects of traumatic experiences.

This study's findings showed that some participants experienced persistent trauma symptoms. Empirically validated psychotherapeutic approaches are beneficial for the treatment of persistent secondary PTS. This study's participants were members of a university search-and-rescue student club; such organizations that coordinate volunteers' activities and pool resources for them can provide them with free psychotherapy services.

Focusing on facilitating VPTG is as crucial as overcoming voluntary search-and-rescue workers' post-traumatic stress. However, little empirical research exists on how to facilitate VPTG (Deaton et al., 2021). Future research should focus on the factors that enable disaster-aid providers' philosophical, physical, and spiritual growth. As previously mentioned, there is an argument in the literature that different types of trauma might lead to different PTG. This study's findings indicate that while participants showed VPTG signs in personal strength, relating to others, appreciation of life, and striving to do one's job better, they did

not express anything indicating growth in the areas of new possibilities, spiritual change, or being involved in social justice issues. This study's results may contribute to deepening this debate in the literature. In the future, as similar studies are repeated, the VPTG phenomenon will become better understood regarding volunteer search-and-rescue teams aiding in earthquake recovery.

This study's findings are not generalizable because of the nature of the qualitative research. This study is further limited because it focuses on a single voluntary search-and-rescue team. However, the findings can be used to deepen the understanding of the study phenomenon and incorporate voluntary search-and-rescue teams' needs into future research agendas and the development of post-disaster interventions to prevent post-traumatic stress reactions and enable post-traumatic growth. This research was conducted a year after the Izmir earthquake with search-and-rescue workers, which can also be considered a limitation. In the future, similar research should employ a qualitative longitudinal approach, which would allow examination of the sequence of the VPTG domains and gain a deeper understanding of the changing experiences of participants over time.

Acknowledgements

I would like to thank all the participants for genuinely sharing their experiences with me. I also wish to thank Belgin Özçelik for helping me reach out research participants and giving her valuable feedbacks on the paper. I am grateful to a further anonymous reviewer for her constructive comments on the drafts of this article.

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