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A brief religiously-adapted cognitive behavioral therapy intervention for Acute Stress Disorder (ASD) after Kahramanmaraş earthquake in Türkiye: a case series

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Abstract

Background After earthquakes, disaster survivors frequently experience acute psychological distress and require time- and resource-efficient, accessible, and culturally sensitive interventions. Integrating religious values into psychological interventions may enhance acceptability and effectiveness in such contexts.

Methods This case series aimed to develop a brief religiously-adapted cognitive behavioral therapy (CBT) intervention program sensitive to religious values for individuals experiencing acute stress symptoms. Seven earthquake survivors with acute stress symptoms participated. The DSM-5 Acute Stress Symptoms Severity Scale was used for initial screening, and the Stress Symptoms Subscale of the Posttraumatic Diagnostic Scale (PDS) was used to assess symptom severity at pre-intervention, post-intervention, and at 1-week, 1-month, and 1-year follow-up. Participants received a 5-session, 2.5-week intervention designed in consultation with religious authorities and trauma experts. The study was conducted in March 2023.

Results The intervention appeared to contribute to a notable reduction in posttraumatic stress symptoms. On average, participants exhibited a 46% decrease in scores on the PDS Stress Symptoms Subscale following the intervention. These improvements were sustained across all follow-up periods.

Conclusions The brief religiously-adapted cognitive behavioral therapy intervention for ASD appears to be a feasible and practical short-term approach for reducing acute stress symptoms and potentially preventing the development of PTSD in post-earthquake populations seeking religious-sensitive psychological care.

Keywords ASB, Brief intervention, Earthquake, Religiously integrated cognitive behavioral therapy, Case series

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Introduction

Earthquakes are among the most devastating natural disasters, deeply affecting buildings, other structures, the environment, and people's way of life due to the sudden shaking of the earth's surface. They result in consequences such as death, illness, economic hardship, and reduced cognitive performance [1, 6, 23, 29, 37, 58]. On February 6, 2023, Türkiye experienced a massive earthquake that affected 11 Eastern and Southeastern Anatolia provinces, causing significant loss of life and widespread destruction [27].

Psychological distress is one of the most common issues encountered among survivors of traumatic events such as earthquakes [30]. The initial psychological response that emerges in the aftermath is typically referred to as an acute stress reaction [9]. According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) [2], when such reactions persist for between three days and one month, the condition is classified as Acute Stress Disorder (ASD). ASD is characterized by intrusive memories, avoidance behaviors, negative affect, and hyperarousal following direct or indirect exposure to a traumatic event. If symptoms persist for more than one month, the condition may be diagnosed as Post-Traumatic Stress Disorder (PTSD). Although most individuals are assumed to recover naturally within 3 to 6 months following trauma [15], a prospective two-year study found that 78% of those initially diagnosed with ASD met the criteria for PTSD at the six-month follow-up [35]. Therefore, early identification of ASD is essential for evaluating the risk of PTSD and implementing timely preventive interventions.

In the aftermath of major disasters—such as the earthquakes in Türkiye, Taiwan, Iran, and Pakistan, as well as the tsunami in Asia over the past decade—there has been a growing demand for short-term, cost-effective psychological interventions that can be rapidly deployed to disaster victims. It has been noted that existing PTSD treatments are neither brief nor feasible enough for large-scale dissemination under post-disaster conditions [8]. However, psychotherapeutic interventions with demonstrated efficacy for ASD typically consist of 5–6 sessions and have shown favorable outcomes [17].

A review of the literature on trauma-related psychological treatments shows that research on PTSD dominates the field (e.g., [11, 43, 45–47]). Although studies specifically targeting ASD are relatively limited, most support Cognitive Behavioral Therapy (CBT) as an effective treatment modality for ASD [18–21]. Despite its demonstrated efficacy, most existing CBT protocols for ASD have been developed in Western contexts and often lack cultural and religious adaptations [18, 19].

It is well established that individuals frequently turn to religion as a means of coping with trauma [59]. While positive religious coping has been linked to post-traumatic growth, negative religious coping has been associated with heightened PTSD symptoms [32]. Moreover, some studies suggest that individuals' perceptions of and attitudes toward God may influence the development of PTSD or contribute to post-traumatic growth [59]. In a case series involving four individuals with PTSD symptoms, a spiritually based intervention was implemented, resulting in symptom reductions within a few weeks [54]. The observed impact of religion on psychological well-being has sparked growing interest in the development of therapeutic programs that integrate religious and spiritual elements [22].

Religiously integrated cognitive behavioral therapy (RCBT) is a therapeutic approach that adapts standard CBT protocols to align with clients' religious beliefs and practices, while remaining sensitive to their spiritual values [25]. Randomized controlled trials have provided empirical support for the efficacy of RCBT in treating various psychological conditions, including depression [4], generalized anxiety disorder [12, 60]. A prominent example is the Islamic Trauma Healing Intervention—a culturally and spiritually adapted form of CBT specifically developed for Muslim populations [10, 61]. Similarly, in their case study, Işık and Toprak [40] applied religious reframing and hope-focused techniques to address post-traumatic guilt, anger, and beliefs about justice. They found that practices such as repentance, the 4 T model, and afterlife metaphors were associated with symptom reduction, strengthened religious connection, and increased value-oriented behaviors in the client.

Despite growing interest in this field, substantial gaps remain regarding practical guidance on integrating religion into psychotherapy. As de Abreu Costa and Moreira-Almeida [25] highlight, there is a pressing need to address the "how-to" gap in developing religion-adapted interventions. This limitation is particularly significant in contexts where religion and spirituality play a central role in coping with trauma. Although some culturally adapted CBT models have been developed for PTSD and other conditions [38], the literature lacks brief, culturally and religiously tailored interventions specifically designed for the acute phase of trauma recovery. In particular, early interventions that incorporate religious meaning-making, faith-based behavioral strategies, and spiritual support systems into evidence-based treatment frameworks remain scarce. This gap underscores the need for innovative models that can address the urgent psychological needs of disaster survivors while honoring their cultural and religious identities.

In line with this need, a brief version of The Brief Religiously-Adapted CBT Intervention Program was implemented for the first time following the February 2023 earthquakes in Türkiye, targeting individuals

experiencing acute stress symptoms. This initial version focused on early symptom stabilization through religiously adapted psychoeducation and behavioral strategies. It later served as the foundation for a revised and expanded version tested in a quasi-experimental study targeting PTSD symptoms [57]. The present study reports the outcomes of the original intervention delivered during the acute phase.

Method

Participants

The participants were volunteers who had directly experienced and been affected by the earthquake that struck Türkiye on February 6, 2023, impacting 11 provinces in the Eastern and Southeastern Anatolia regions (Kahramanmaraş, Hatay, Adıyaman, Gaziantep, Malatya, Kilis, Diyarbakır, Adana, Osmaniye, Şanlıurfa, and Elazığ). These individuals agreed to participate in the study in order to receive psychological support services. A total of 64 individuals initially applied to take part in the intervention.

Of the 64 individuals who initially applied to participate, 60 were female (93.8%) and 4 were male (6.3%). Participants' ages ranged from 12 to 57 years (M = 29.10). Five participants reported that their buildings collapsed, although they were not trapped under the debris. Three participants lost first-degree relatives, and nine lost second-degree relatives. Thirty-nine participants did not experience direct physical harm but witnessed significant destruction in their surroundings, while eight experienced only the tremor itself. Additionally, 55 participants expressed a desire to include religious elements in the psychological support process, whereas nine did not. Of the initial 64 self-referred applicants seeking psychological support after the earthquake, 30 individuals with high acute stress symptom severity—as determined by scores on the DSM-5 Acute Stress Symptom Severity Scale—were invited to participate in the intervention. This paper reports on the case series of seven participants (M = 29.4, range = 19–40) who completed all five sessions of the program and provided both pre- and post-intervention data, including follow-up assessments.

These seven cases were selected for inclusion in the case series based on treatment completion and the availability of complete pre-, post-, and follow-up data, constituting a purposive sample. All participants identified as Muslim; therefore, the intervention content was explicitly tailored to Islamic religious and cultural contexts.

Procedure

Patient care and reporting of this case series complied with the CARE (Case Report) guidelines [55].

A survey form—comprising the Informed Voluntary Consent Form, Sociodemographic Information Form, and DSM-5 Acute Stress Symptom Severity Scale—was created using Google Forms and distributed via social media platforms. Participants who applied were initially contacted by phone and underwent a preliminary evaluation interview. As a result of the assessments, interviews were conducted with people who were over the age of 18, did not have any diagnosed psychiatric disorders other than post-traumatic stress symptoms and disorder, and were not currently undergoing psychotherapy. Participants were ranked based on the severity of their acute stress symptoms, and treatment was initiated primarily with those exhibiting the most severe symptoms. Before the intervention, a questionnaire form—including the Posttraumatic Diagnostic Scale (PDS)—was administered via Google Forms to assess the severity of post-traumatic stress reactions. Given the acute post-disaster context, brief clinical assessments were conducted during the initial contact with participants to screen for Acute Stress Disorder (ASD) symptoms and to perform a preliminary differential diagnosis based on clinical judgment. However, no structured clinician-administered diagnostic interviews were used. The primary findings are based exclusively on validated self-report instruments, which also served as the study's pre- and post-test measures. After these baseline assessments, the participants started a brief intervention program of 5 sessions lasting 2.5 weeks, developed in consultation with religious authority and trauma experts. The intervention was delivered through online sessions. Following the intervention, participants completed the post-test assessment. Intervention sessions and data collection were conducted in March 2023, approximately one month after the earthquake that occurred in February 2023 in southeastern Türkiye.

Post-test data were collected immediately after the intervention. To assess the durability of treatment effects, the same measurement tools were administered again at 1-week, 1-month, and 1-year follow-up points. All follow-up assessments were completed by participants included in the final analysis. Participants also provided written feedback through an online questionnaire administered after the intervention.

Measures

The sociodemographic information form and DSM-5 Acute Stress Symptom Severity Scale were used to identify the participants, and the Stress Symptoms Subscale, a subscale of the Post-traumatic Diagnostic Scale, was used at the beginning and end of the treatment and in follow-up measurements to determine the level of post-traumatic stress reaction.

Sociodemographic information form

This form, administered to participants, was designed to collect sociodemographic data and assess the severity of acute stress symptoms. It included questions on personal and contact information (e.g., name, email address, phone number, and a relative's phone number), as well as age, gender, education level, occupation, marital status, pre- and post-earthquake residence, date of leaving the earthquake zone, reasons for seeking psychological support, perceived impact of the earthquake, current psychological support, psychiatric diagnoses and treatment status, and preferences regarding the inclusion of religious or spiritual elements in the psychological support process.

DSM-5 acute stress symptom severity scale (NSESSS)

The Turkish adaptation of the NSESSS, developed to assess the severity of acute stress disorder symptoms according to DSM-5 criteria, was validated by Aşçıbaşı et al. [5]. This 7-item self-report scale evaluates acute stress symptoms following highly stressful events in individuals aged 18 and above. Items are rated on a 5-point scale (0–4), yielding a total score ranging from 0 to 28, with higher scores indicating greater symptom severity. In the validation study, the Turkish version demonstrated excellent reliability (Cronbach's alpha = 0.95) and strong item-total correlations (r = 0.76–0.88), supporting its psychometric soundness.

Post-traumatic Diagnostic Scale (PDS)

Developed by Foa et al. [31], the PDS assesses post-traumatic stress disorder (PTSD) and related negative outcomes in individuals exposed to traumatic experiences, based on DSM-IV diagnostic criteria. The scale consists of four sections: (1) the first two parts comprise six items assessing the A1 and A2 criteria of DSM-IV and are referred to as the "Event Severity Subscale",(2) the third section, the "Stress Symptoms Subscale," includes 17 items addressing DSM-IV criteria B, C, and D, scored on a 4-point scale (0–3). The total score from these 17 items yields a "Total Symptom Index," which evaluates re-experiencing/intrusive thoughts, avoidance/emotional numbing, and hyperarousal symptoms; (3) the fourth section, the "Event Impact Subscale," is a 9-item yes/no measure assessing functional impairment related to DSM-IV criterion F. The original scale demonstrated high internal consistency (Cronbach's alpha = 0.92) and test–retest reliability (0.83; [31]). In the Turkish adaptation study by Işıklı [41], the 17-item Stress Symptoms Subscale showed excellent reliability (Cronbach's alpha = 0.93), with internal consistency coefficients of 0.86 for re-experiencing, 0.85 for avoidance, and 0.85 for hyperarousal symptom clusters. These findings indicate that the Turkish version of the PDS is both valid and reliable.

Data analysis

In addition to the qualitative case descriptions, a quantitative analysis was conducted to evaluate the effectiveness of the intervention over time. Mean scores and standard deviations for PTSD symptom severity—measured by the Post-Traumatic Diagnostic Scale (PDS)—were calculated at five time points: pre-test, post-test, 1-week follow-up, 1-month follow-up, and 1-year follow-up. Cohen's *d* effect sizes were computed by comparing each follow-up time point to the pre-test scores using pooled standard deviations.

To determine whether the observed reductions in post-traumatic stress symptoms were clinically significant at the individual level, the Reliable Change Index (RCI) was calculated for each participant using the method proposed by Jacobson and Truax [42].

Intervention

Developing a brief religiously-adapted CBT intervention for ASD after an earthquake

Taha Burak Toprak developed the Brief Religiously-Adapted CBT Intervention for ASD, a program designed to provide a culturally sensitive, religiously-integrated, and time-efficient early intervention aimed at reducing trauma-related symptoms and preventing the development of PTSD in the aftermath of an earthquake.

The intervention was explicitly developed within an Islamic framework rather than a general spiritual orientation. It incorporates core religious practices such as Islamic prayer rituals and was structured with input from both religious authorities and trauma experts. The program aims to ensure religious congruence and contextual relevance by adapting therapeutic techniques to align with the participants' Islamic worldview. Therefore, it is best characterized as a religion-specific, Islam-based intervention, rather than a generic spiritually integrated approach (Appendix A provides further detail).

The brief intervention program, delivered over two and a half weeks, consisted of five online sessions (two sessions per week), each lasting approximately 50 min. The intervention content was developed by reviewing national and international post-disaster models (e.g., [16, 48, 50]), with additional components focusing on values and religiosity. Prior to implementation, therapists received training on the intervention model and were supervised by the model developer—a cognitive therapist accredited by the Academy of Cognitive Behavioral Therapy (ACT) and certified by the European Association for Behavioural and Cognitive Therapies (EABCT).

Weekly online supervision meetings with the model developer enabled therapists to review client progress, address implementation challenges, and monitor treatment fidelity. To support consistency, therapists completed brief session reports summarizing key intervention components delivered, which were then discussed during

supervision. Although formal adherence checklists and independent ratings were not employed, fidelity was documented through these session reports and supervision notes, ensuring a consistent application of both cognitive-behavioral techniques and religiously integrated elements across therapists. The general content structure of the intervention sessions is outlined below:

Session 1: assessment interview

This session focused on conducting a differential diagnosis by obtaining anamnesis information and listening to the patient's narrative about earthquake-related difficulties. Following this initial assessment, a problem list and therapy goals were collaboratively established with the patient, with particular emphasis on earthquake-related issues rather than other life problems. The purpose and scope of treatment were explained to the patient. At the end of the session, brief normalization of post-traumatic symptoms was provided, considering the acute severity of the symptoms. Importantly, the symptoms expressed by the patient as complaints were addressed, while avoiding information about unmentioned symptoms to prevent debriefing, which is known to have adverse psychological effects [26].

Session 2: psychoeducation

This session focused on providing psychoeducation tailored to the patient's traumatic symptoms after collaboratively clarifying the therapy goals and problem areas. Psychoeducation was intentionally limited to the symptoms explicitly addressed during the first session to avoid overwhelming the patient. Cognitive distortions and both internal and external avoidance behaviors related to the trauma were identified, along with maladaptive cognitions that could be targeted in subsequent interventions. The relationship between these cognitions and the patient's symptoms was explained to enhance their awareness and engagement in the therapeutic process. Additionally, the importance of active participation in daily life and adopting value-oriented behaviors was emphasized. To support this, the patient's core values were explored using value-clarification questions, and homework was assigned for the next session, which involved identifying and writing down new behaviors aligned with their values under the current circumstances.

Session 3: cognitive restructuring and values

This session focused on intervening in trauma-related cognitive distortions identified in the previous session by collaboratively clarifying these thoughts and generating alternative, more adaptive cognitions. To support this process, metaphors were incorporated to facilitate meaning-making within the therapeutic model. Once cognitive restructuring was completed, behavioral assignments targeting avoidance patterns were developed. Given the acute stress phase, flexibility regarding exposure tasks was maintained to accommodate the patient's current state. After collaboratively setting behavioral goals, potential obstacles were explored, and strategies to overcome these barriers were discussed. Research suggests that engaging in value-consistent behaviors is associated with reductions in post-traumatic stress symptoms and increases in post-traumatic growth and quality of life [7, 28, 34]. In line with this, the patient was encouraged to reflect on value-oriented behaviors identified during the week and to select and engage in those they considered meaningful for implementation before the next session.

Session 4: religious intervention

Considering the cultural context of the earthquake region and the relevant literature, this session was dedicated to religious intervention. After briefly reviewing the cognitive restructuring process, the therapist set the agenda by exploring how the patient interpreted the traumatic events within a religious and spiritual framework. The discussion was introduced as follows:

> *"In this process, we talked about how going through such a profound event can deeply affect our view of life, people, and the world. Together, we reflected on how we might gently revisit these changes, consider alternatives to the thoughts that have been shaken or wounded, and explore ways of thinking that could support your healing. One very sensitive and important area is our relationship with the Creator—our beliefs about Him and how we make sense of His role in what has happened. Today, I would like us to focus on this. First, I wonder: have you noticed any changes in your thoughts about fate and God since this event? Or have you found yourself holding on to thoughts about fate and God that feel heavy, that don't seem to help you cope, make sense of things, or that leave you feeling sad, hopeless, or helpless? Let's sit with these together and see what comes up."*

After identifying dysfunctional religious cognitions, these were restructured using references from a prepared guide addressing common spiritually distorted thoughts observed after the earthquake. This resource, developed in consultation with Islamic scholars and religious authorities, included theological reflections on understanding disasters as a test, the connection between hardship and personal growth, and perspectives on why the Creator allows loss. The session also reinforced the integration of value-oriented behaviors with religious values, highlighting how aligning actions with one's faith can support emotional and spiritual healing.

Table 1 Symptom severity scores of seven participants over time

Case ID	NSESSS (Initial Contact)	PDS Pre-test (Session 1)	PDS Post-test (Session 5)	PDS 1-week Follow-up	PDS 1-month Follow-up	PDS 1-year Follow-up
C1	19	33	18	13	11	9
C2	14	26	16	10	14	10
C3	14	35	19	18	10	11
C4	18	41	27	21	13	10
C5	18	42	15	18	17	5
C6	17	45	28	26	17	19
C7	19	32	13	16	14	9

1-week, 1-month, and 1-year = Follow-up assessments after the intervention. Lower scores indicate lower symptom severity

NSESSS DSM-5 Acute Stress Symptom Severity Scale score measured at initial contact (screening phase), *PDS* Post-Traumatic Diagnostic Scale scores measured across five time points, *Pre-test* Before session 1, *Post-test* After session 5

Table 2 Descriptive statistics and effect size for PDS scores across time points (N = 7)

Time Point	Mean (M)	Standart Deviation (SD)	Minimum	Maximum	Cohen's d
Pre-test	36.29	6.68	26	45	
Post-test	19.43	5.86	13	28	–2.68 (vs Pre)
1-week FU	17.43	5.22	10	26	–3.15 (vs Pre)
1-month FU	13.71	2.69	10	17	–4.43 (vs Pre)
1-year FU	10.43	4.24	5	19	–4.62 (vs Pre)

Cohen's d values represent standardized mean differences compared to pre-test scores. According to Cohen [24], d values above 0.80 indicate large effects. All values indicate large and sustained treatment effects

FU Follow-up

Session 5: relapse prevention

This final session involved a brief review of the therapeutic process and progress achieved thus far. The therapist highlighted potential internal and external obstacles that might disrupt the patient's progress and discussed strategies for coping with these challenges. Guidance was provided on how to respond if post-traumatic symptoms reemerge or intensify. In the event of a relapse, the patient was encouraged to first apply the skills and strategies learned during therapy, and if no improvement occurs, to seek professional support. The session concluded by emphasizing the importance of the patient's newly developed ways of interpreting events and the values they had identified, encouraging them to maintain value-oriented behaviors as part of their ongoing recovery.

Results

This study presents data from seven participants who completed the brief intervention. Each case summary includes key background information and notable aspects of the therapeutic process. To protect confidentiality, identifying details were modified. The seven participants were seen by different therapists; five were female and two were male. Table 1 displays their post-traumatic stress symptom scores at baseline (pre-intervention), immediately after the intervention (post-test), and at 1-week, 1-month, and 1-year follow-up assessments.

Cohen's d effect sizes were calculated using pre-test and post-test PDS scores to evaluate the magnitude of symptom reduction. The analysis revealed a large effect size (d = 2.68), indicating that the intervention was associated with a substantial reduction in post-traumatic stress symptoms immediately after treatment.

Furthermore, follow-up assessments continued to demonstrate significant and sustained effects. Specifically, Cohen's d values were –3.15 at the 1-week follow-up, –4.43 at the 1-month follow-up, and –4.62 at the 1-year follow-up, all indicating substantial and lasting reductions in symptoms compared to baseline (see Table 2).

These results suggest that the Brief Religiously-Adapted Cognitive Behavioral Therapy Intervention Program was not only associated with positive outcomes in the short term but also maintained its therapeutic benefits over a one-year period.

To determine whether the observed changes in ASD symptoms were statistically reliable at the individual level, the Reliable Change Index (RCI; [42]) was calculated for each participant. The RCI formula compares pre-test and post-test scores, adjusting for the standard error of measurement and the test–retest reliability of the scale.

Using a pre-test standard deviation of 6.68 and a test–retest reliability coefficient of 0.83 [31], the standard error of the difference (S_diff) was calculated to be approximately 3.89. An RCI value exceeding ± 1.96 indicates a statistically reliable change at the $p < 0.05$ level.

RCI scores ranged from –2.57 to –6.93 across participants, with all seven participants demonstrating reliable

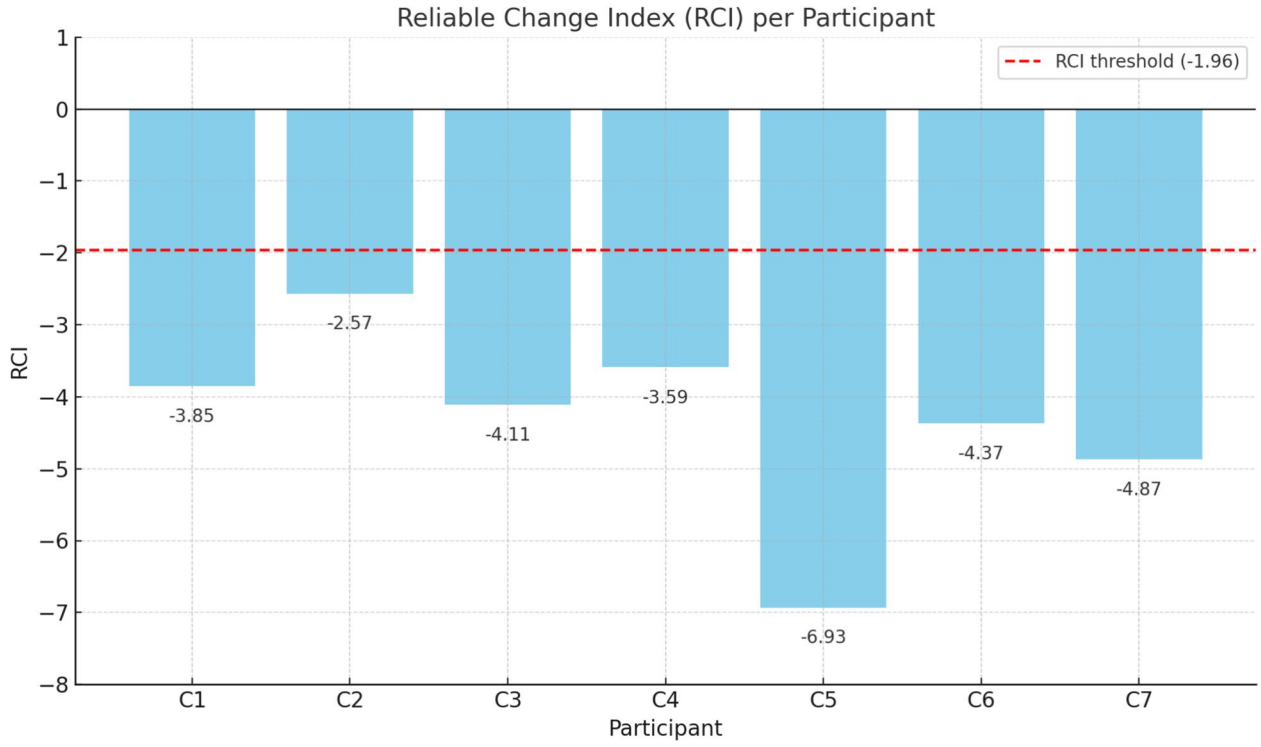

Fig. 1 Reliable Change Index (RCI) scores for each participant based on Pre-Post PDS scores. Note. This figure illustrates the Reliable Change Index (RCI) scores for seven participants, calculated using pre- and post-test scores on the Post-traumatic Diagnostic Scale (PDS). The red dashed line represents the threshold for statistically reliable change (RCI = −1.96)

improvement (see Fig. 1). These findings indicate that symptom reductions were not only statistically significant at the group level but also clinically meaningful and reliable at the individual level.

Case examples

Case 1 (C1)

C1 is a 19-year-old single female preparing for university exams who experienced the earthquake at home in Adıyaman. She reported persistent fear of aftershocks, sleep disturbance, hyperarousal, and difficulty concentrating, which interfered with her studies. Initial scores indicated moderate ASD symptoms (NSESSS: 19; PDS: 33).

The intervention included psychoeducation, cognitive restructuring (e.g., differentiating vigilance from anxiety), anger management, and values-based goal setting. Religious content, such as interpreting the earthquake through a spiritual lens and focusing on worship, was perceived as beneficial.

By post-treatment, she reported reduced hypervigilance, improved family interactions, and resumed studying. Follow-up scores confirmed sustained improvement (PDS post-test: 18; 1-month: 11; 1-year: 9). As she reflected on the process, she stated:

> *"Patience, not getting angry, and thinking positively were the most important things I learned in this process."*

Case 2 (C2)

C2 is a 28-year-old single university graduate who experienced the earthquake in Adana, where she lived with her family. She also lost her aunt and cousin in Hatay during the same event. Two weeks after the disaster, she applied for support and began the intervention. Her initial symptoms included sleep disturbance, intrusive imagery, persistent anxiety, crying spells, and dissociative episodes. She reported distressing mental images related to waiting by the rubble, which she tried to suppress, believing they would otherwise become permanent.

At baseline, her NSESSS score was 14 and PDS score was 26, indicating moderate acute stress symptoms. The intervention included psychoeducation, cognitive restructuring targeting trauma-related suppression beliefs, values-based activity planning, and the use of Islamic spiritual resources to process grief.

Post-treatment results showed a marked reduction in symptoms (PDS post-test: 16; 1-month: 14; 1-year: 10). C2 engaged in volunteer work in the first month after treatment and demonstrated resilience despite a temporary symptom increase, which was addressed with an additional booster session. Reflecting on the therapeutic process, she shared:

> *"The decrease in my negative thoughts and the consolation of religious support helped me to benefit from the process. I'm glad I received this support."*

Case 3 (C3)

C3 is a 32-year-old single woman living alone in Malatya. She was interviewed two weeks after the earthquake. During the quake, she was home alone and witnessed significant destruction in her environment. She reported persistent fears of another earthquake, anxiety about being buried under rubble, difficulties meeting daily needs, and avoidance behaviors such as sleeping with the lights and doors open or avoiding showers.

Her baseline scores were NSESSS = 14 and PDS = 35, indicating moderate acute stress symptoms. The intervention involved psychoeducation on acute stress reactions, cognitive restructuring of catastrophic thoughts ("an earthquake will happen at any moment"), reduction of avoidance, and strengthening of value-driven behavior. Religious-metaphorical frameworks were also used to help integrate the experience into her belief system.

At follow-up, C3 reported significant relief in symptoms and improved coping skills. Her PDS scores decreased notably over time (post-test: 19; 1-month: 10; 1-year: 11). She expressed the following in her feedback:

> *"I learned how to distinguish between necessary preparedness and exaggerated fear. Now I feel more in control."*

Case 4 (C4)

C4 is a 23-year-old single woman living with her family. She was assessed approximately 40 days after the earthquake. During the event, she was at home and later witnessed the devastation and challenging scenes as her city was being evacuated. She remained in Kahramanmaraş for three days before relocating.

She reported symptoms including inability to sleep in silence, darkness, or with the door closed, intrusive thoughts related to her shock reaction, and guilt for not remembering to pray during the quake. She also described depressive symptoms, hopelessness about the future, and feelings of ineffectiveness for having left the city while others remained in distress. At intake, her scores were NSESSS = 18 and PDS = 41, reflecting moderate-to-severe acute stress symptoms.

During the intervention, psychoeducation and religiously integrated sessions helped her reframe her guilt and reinterpret her reactions. Avoidance behaviors decreased, and her depressive cognitions were restructured.

Follow-up results demonstrated a marked symptom reduction (PDS post-test: 27; 1-month: 13; 1-year: 10). In her own words:

> *"At first, everything was confusing—the earthquake and the aftermath were unclear to me, but now things feel much clearer."*

Case 5 (C5)

C5 is a 40-year-old single woman working as a store manager. She was assessed approximately two weeks after the earthquake. At the time of the event, she was at home in Şanlıurfa, where she felt the tremors and witnessed significant destruction. She also lost second-degree relatives in the earthquake.

Her primary complaints included a persistent fear that another earthquake would occur, hyperreactivity to loud sounds, and impaired daily functioning. She reported sleep disturbances, frequent nightmares about earthquakes, new-onset fears of darkness and solitude, and avoidance behaviors such as using the bathroom less frequently and avoiding elevators. She also experienced concentration difficulties. At baseline, her NSESSS score was 18 and PDS score was 42, indicating moderate acute stress symptoms.

Following the intervention, C5 benefited from psychoeducation regarding acute stress symptoms and the normalization of anxiety. She reported that discovering and acting in line with her personal values, alongside religious reflections shared during the sessions, had a motivating and healing effect.

> *"I learned how to cope with my anxieties; I realized they can happen, but we also have values in life, and we should live according to them."*

At the 1-month follow-up, she had returned to independent living, could use the elevator and bathroom comfortably, and had regained her ability to engage in positive social interactions. Table 1 shows that her symptoms decreased post-treatment (PDS post-test: 15) and continued to improve over time (1-month: 17; 1-year: 5), despite a slight temporary increase at the first follow-up.

Case 6 (C6)

C6 is a 35-year-old single female civil servant who experienced the earthquake in her home in Gaziantep. She was assessed approximately two weeks after the disaster. C6 reported witnessing severe destruction and human suffering both in her city and during multiple visits to Adıyaman, where she saw dead bodies and severely injured individuals. The inadequacy of aid efforts and the helplessness of those affected further exacerbated her psychological distress.

Her main symptoms included persistent intrusive images, trembling, sleep disturbances, and palpitations—especially when alone. She had a prior diagnosis of panic disorder and was referred for psychiatric consultation, initiating pharmacological treatment (Paroxetine 20 mg/day). At baseline, her NSESSS score was 17 and PDS score was 45, indicating moderate-to-severe acute stress symptoms.

Throughout the intervention, she benefited from psychoeducation on acute stress reactions and cognitive

restructuring targeting catastrophic expectations like "an earthquake will happen at any moment." Avoidance behaviors were addressed and value-oriented actions were encouraged. She reported significant improvements in her core symptoms, supported by both therapy and medication.

> *"I feel calmer, my perspective on things is more understanding. I started to listen and understand people more."*

C6 attributed her improvement to feeling heard and validated by her therapist, as well as the emotional support and recognition of her contributions during post-disaster aid:

> *"Being reminded of the work we had done in the earthquake region made me happy and honored—especially when it was remembered positively after 2.5 months."*

Her PDS scores showed a decrease from post-test (28) to follow-up (1-month: 17; 1-year: 19), indicating initial symptom relief with some fluctuation over time (see Table 1).

Case 7 (C7)

C7 is a 29-year-old married housewife who was assessed approximately two weeks after the earthquake. At the time of the disaster, she was on the 13th floor of a 15-story apartment building in Mersin. She reported experiencing intense fear and anxiety during the tremors and had not returned to her home since, choosing instead to stay at her mother's house.

C7 described persistent fears of another earthquake, preferred to live close to exits, and had heightened anxiety particularly related to her 2-year-old child's safety. Her husband's insistence on staying in their original home contributed to her distress. She was afraid of being alone, unable to sleep or stay in multi-story buildings, and reported disrupted sleep patterns. At baseline, her NSESSS score was 19 and PDS score was 32, indicating moderate acute stress symptoms.

Following the intervention, C7 reported normalization of her symptoms through psychoeducation about acute stress reactions. She benefited from cognitive restructuring of her belief that another earthquake "must not happen," and was able to replace avoidance behaviors with value-driven actions. She gradually returned home and resumed everyday routines, such as spending time with her family and engaging in household responsibilities.

> *"I learned that this is a normal and temporary process, that my fears cause my anxiety, what I did before and how I overcame it, and that I will succeed again."*

C7's post-test (PDS: 13) and follow-up (PDS 1-month: 14; 1-year: 9) scores reflect a consistent reduction in symptoms over time (see Table 1).

Discussion

Although acute stress reactions may resolve spontaneously in some individuals, they can sometimes progress to Post-Traumatic Stress Disorder (PTSD) if left unaddressed [15, 35]. Considering this risk, early and brief interventions during the acute post-trauma phase are seen as crucial for supporting recovery and preventing symptom chronicity. Moreover, post-traumatic responses are shaped by cultural and religious context [39], and interventions lacking sensitivity to these dimensions may compromise therapeutic engagement and effectiveness. In response to these needs, the present study implemented a brief, culturally and religiously adapted cognitive behavioral intervention designed to address acute stress symptoms in a population heavily affected by the February 2023 earthquakes in Türkiye. These areas were heavily affected by the February 2023 earthquakes, which impacted approximately 13.5 million people and are predominantly home to a religious population [3, 51].

In the study, 55 out of 64 participants indicated that they preferred the inclusion of religious and spiritual elements in therapy. This finding is consistent with previous research suggesting that many clients expect their beliefs to be acknowledged in therapeutic settings [44, 53]. Similarly, a recent study conducted after the Kahramanmaraş earthquakes reported that individuals in disaster-affected areas expressed strong trust in religious coping strategies [33].

All participants in the case series demonstrated a reduction in post-traumatic stress symptoms over time. Specifically, participants experienced a 46% reduction in scores on the PDS Stress Symptom Subscale, and symptom reduction was maintained at 1-week, 1-month, and 1-year follow-up. Four participants (C1, C2, C3, and C7) showed consistent improvement at all assessment points, while C5 and C6 exhibited some fluctuations during intermediate stages but ultimately achieved improvement. Although causal inferences are limited due to the uncontrolled design, these trends suggest clinically meaningful improvements in trauma-related symptoms. These findings are further supported by a larger quasi-experimental study evaluating a revised version of the same protocol, which reported similar positive outcomes [57]. When considered together, these results suggest that a short-term CBT approach incorporating religious elements may support the reduction of acute stress symptoms and potentially prevent the development of PTSD in disaster survivors, which aligns with previous studies highlighting the value of integrating religiosity into trauma-focused interventions [12, 40].

Participants noted that psychoeducation helped reduce distress by normalizing their acute stress reactions (e.g., C1, C3, C4, and C6), consistent with findings suggesting that psychoeducation may reduce PTSD symptoms [13]. Also consistent with previous evidence, cognitive restructuring techniques were perceived as helpful, particularly in addressing hyperarousal thoughts such as fear of another earthquake. For example, C1 and C3 reported that such techniques helped them challenge maladaptive beliefs [49, 56].

In addition to cognitive and educational strategies, religious content was found to play a central role in facilitating emotional and cognitive recovery. Participants frequently mentioned religious narratives as a source of comfort and meaning. C2 and C4 reported finding solace in Islam's teachings on divine will and death, while C1 and C7 described experiencing a renewed sense of purpose, spiritual motivation, and reevaluation of values. These processes appear to have supported behavioral change and emotional stability. Functional gains were also observed. For example, C1 resumed preparing for university entrance exams; C5 began living independently and using the elevator again; and C7 could sleep at home and care for their child without panicking. C2 participated in volunteer work following the intervention. These developments suggest that the intervention may have supported symptom reduction, functional improvement, and the ability to adapt to daily life. Despite initial confusion and uncertainty about the future, participants gradually reconnected with their values and began value-based actions. This reflects therapeutic processes frequently emphasized in Acceptance and Commitment Therapy [36].

Additionally, participants reported that adopting positive religious coping methods helped them maintain their hope and determination. This is consistent with studies showing that religious coping styles and perceptions of God influence both PTSD risk and post-traumatic growth potential [32, 59]. Participants also described how they changed their inconsistent beliefs and negative religious coping strategies into more theologically sound and psychologically consistent perspectives.

In some cases, individual-level factors influenced therapeutic outcomes. For example, C6's case highlighted the benefits of combining short-term psychotherapy with pharmacological treatment in individuals with comorbid panic disorder. C2 required an additional support session due to symptom recurrence during the fieldwork, underscoring the necessity of flexibility in trauma care. While these findings are encouraging, it is important to acknowledge the possibility of spontaneous improvement, which is known to occur in the natural course of ASD [15]. While most participants attributed their improvements to the intervention, one individual noted that their recovery may have occurred independently. Although the findings suggest that the religiously-adapted CBT intervention contributed to a meaningful reduction in acute stress symptoms, alternative explanations should be considered. Some participants may have experienced spontaneous recovery, as natural remission of stress reactions is common in the months following a disaster. Similarly, placebo effects associated with receiving structured attention and care could have influenced self-reported improvements. In addition, external factors such as social support, community solidarity, or gradual improvements in living conditions may also have played a role. While these factors were not controlled for in this case series, they cannot be fully disentangled from the observed improvements, and thus the results should be interpreted with caution. These limitations highlight the need for future randomized controlled trials with comparison groups to more rigorously determine the unique contribution of the intervention beyond these alternative explanations.

This study has several limitations. One of the key limitations of this study is the lack of gender diversity in the sample, as all participants were female. While this may reflect a greater willingness among women to seek psychological support following traumatic events [52], it limits the generalizability of the findings to male populations. Future research should include more gender-representative samples better to understand potential differences in symptom presentation and treatment responsiveness. Another important limitation is the absence of structured clinician-administered diagnostic tools (e.g., CAPS-5 or SCID) in the assessment process. While brief clinical evaluations were conducted during initial contact based on clinical judgment, all symptom data were derived from self-report instruments. This may reduce diagnostic precision and limit the objectivity of symptom assessment. Future studies should consider incorporating structured diagnostic interviews to enhance methodological rigor and ensure more robust diagnostic validation. In addition, as an uncontrolled case series, the findings cannot be interpreted as definitive evidence of treatment efficacy. Larger clinical studies with control groups are needed to evaluate the intervention rigorously. However, conducting well-controlled studies in disaster contexts presents significant challenges [14].

The present intervention was developed within a specific cultural and religious context, namely the predominantly Muslim population affected by the 2023 earthquakes in Türkiye. Its integration of religious concepts and values may have enhanced acceptability and effectiveness in this setting; however, these features also limit the direct generalizability of the findings to other cultural or religious groups. While the core principles of CBT and brief trauma-focused interventions are broadly

applicable across populations, the religious framing, metaphors, and practices embedded in the program may not resonate with individuals from different faith traditions or secular backgrounds. Future research should therefore examine how similar interventions might be adapted to other cultural and religious contexts, clarifying under what conditions such adaptations would maintain both cultural sensitivity and therapeutic efficacy.

Nevertheless, the urgent psychological needs that arise following traumatic events such as earthquakes necessitate the development of rapid and culturally sensitive interventions. This model was developed in response to this need. Although not a randomized controlled trial, this case series provides a modest contribution to the literature, suggesting that Short-Term Religious Integrated CBT Intervention may help reduce acute stress symptoms and prevent PTSD development in earthquake victims who seek religious integration in therapy.

Conclusions

This case series demonstrates that a short, culturally adapted, religion-sensitive cognitive behavioral intervention may help reduce acute stress symptoms and support functional and emotional recovery following natural disasters. The findings suggest the feasibility and potential effectiveness of culturally and religiously appropriate mental health interventions in post-disaster contexts. Future studies with larger samples and control conditions must assess generalizability and long-term effectiveness.

Appendix

Religious content included in the intervention

The religious content included in the intervention was selected through expert consultation with an religious authority specializing in the life of the Prophet (Sīrah). The verses from the Qur'an and Hadiths were not chosen arbitrarily or based on general religious expressions; instead, they were carefully evaluated based on their context of revelation (*asbāb al-nuzūl*) and potential psychological impact.

For example, the consulted religious authority emphasized the central role of empathy in post-traumatic care. He also highlighted how the Prophet Muhammad responded to pain and grief—with open emotional expression, context-sensitive communication, and careful attention to timing. One key point was that religious messages should be tailored to the emotional readiness of the individual. He advised against religious preaching in moments of emotional overwhelm, comparing such moments to a "flood"—with guidance better delivered after the emotional storm has settled. He also acknowledged that individuals may utter religiously inappropriate statements under intense emotional distress, and such expressions should not be met with judgment or immediate correction.

The religious content chosen for the intervention was subsequently aligned with therapeutic goals and integrated into the protocol in a way that preserves both theological authenticity and clinical functionality. A guide containing the selected verses and Hadiths is presented below.

Recommended verses and hadiths for disaster situations

The following verses and hadiths have been suggested by religious authority as helpful references in times of hardship. They may be shared with distressed individuals if and when they express interest or need.

a) Recommended Supplications (Du ʿā):

- "Indeed, we belong to Allah, and indeed to Him we will return."

"Alladhīna idhā aṣābat-hum muṣība qālū innā lillāhi wa innā ilayhi rājiʿūn" (Qur'an, 2:156)—"Innā lillāhi wa innā ilayhi rājiʿūn"

- "Allah is sufficient for us, and He is the best disposer of affairs."

"Ḥasbunallāhu wa niʿma al-wakīl" (Qur'an, 3:173)
"Our Lord, pour upon us patience and let us die as Muslims [in submission to You]." (Qur'an, 7:126)

- "O Allah, I seek refuge in You from every evil You know, and I ask You for all that is good that You know. I ask for Your forgiveness for all the sins You know. Indeed, You alone know the unseen." (Tirmidhī, Duʿāʾ, 23)
- "We belong to Allah, and to Him, we shall return. O Allah, reward me for my affliction and replace it with something better." (Muslim, Janāʾiz, 4)
- "O Allah, reward me for this calamity and grant me something better in its place." (Muslim, Janāʾiz, 2)

b) If the client insists on asking difficult religious questions, you may consult the *"Difficult Questions and Suggested Responses"* guideline below.

IMPORTANT: DO NOT SHARE THESE RESPONSES UNLESS THE CLIENT EXPLICITLY ASKS

Continually assess whether the person is ready to receive a response based on their tone, emotional state, and word choices. Avoid religious replies to religious expressions made in emotional distress.

Guideline: Difficult Questions and Suggested Responses				
Question	**Not helpful information**	**Not helpful response**	**Helpful information**	**Helpful response**
"Did Allah punish us?"	"All disasters happen as punishments for the sins of people."	"We sinned too much; that's why Allah punished us. We deserved this. Allah finally gave us what we deserved."	According to Islamic theology, any event may contain multiple divine wisdoms, but it is beyond human capacity to fully comprehend these. Islam views such trials as tests that offer opportunities for spiritual purification, forgiveness of past sins, and elevation of spiritual status through patience	"There may be many reasons for what happened, but it is not possible for me—or for anyone—to know the exact reason with certainty."
"Is this a punishment for my sins?"	"One person's sins can cause an entire community to be afflicted with disaster."	"I sinned too much, so Allah is punishing me. I'm responsible for everything that happened to these people."	Religious authority emphasize that communal trials may relate to collective behavior, but each person can focus on positive actions within their own control. Focusing on what one can do constructively may bring relief and purpose in times of hardship	"No individual can be held solely responsible for a disaster that affected an entire society."
"Why did Allah allow this to happen?"	"If Allah is merciful, He should never let His servants suffer."	"Allah shouldn't have allowed this. It's not fitting for His mercy."	In Islam, hardship, fear, loss, and suffering are considered among the trials by which believers are tested. These trials are often followed by promised relief and hidden blessings: spiritual elevation, forgiveness, martyrdom for those who die in disasters, and divine reward beyond one's deeds. Scholars explain this with the metaphor of a seed that must crack under pressure to grow and bear fruit—the hardship becomes the soil of future growth	"Even when I can't fully grasp the wisdom behind painful events, I trust that there is divine mercy in what happened—even if I can't see it right now."

Abbreviations

AFAD Disaster and Emergency Management Presidency (Türkiye)
ASD Acute Stress Disorder
CARE Case Report Guidelines
CAPS-5 Clinician-Administered PTSD Scale for DSM-5
CBT Cognitive Behavioral Therapy
DSM-5 Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
NSESSS DSM-5 Acute Stress Symptom Severity Scale
PDS Post-Traumatic Diagnostic Scale
PTSD Post-Traumatic Stress Disorder
RCBT Religiously Integrated Cognitive Behavioral Therapy
RCI Reliable Change Index
ACT Academy of Cognitive Behavioral Therapy
EABCT European Association for Behavioural and Cognitive Therapies

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Authors' contributions
T.B.T. designed and supervised the study. H.N.Ö. participated in drafting the manuscript. H.R.I. and H.N.Ö. reviewed the literature and revised the manuscript. All authors read and approved the final manuscript.

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Data availability
Data sharing does not apply to this article as no datasets were generated or analyzed during the current study.

Declarations

Ethics approval and consent to participate
Given the time-sensitive nature of Acute Stress Disorder (ASD)—with symptom onset and resolution typically occurring within the first-month post-trauma—it was not feasible to wait for formal ethical approval before initiating this study. Therefore, we collected data after obtaining electronic informed consent from all participants, which aligned with ethical principles for research in emergency contexts. We obtained ethical approval for a separate quasi-experimental study focusing on psychosocial interventions [57]. However, this particular case series emerged as an acute observational response to immediate needs in the field, and prior ethical approval specific to this dataset was not obtained due to time constraints and the emergency nature of the situation. Informed consent was obtained from all participants via an online survey form, and every effort was made to adhere to ethical principles throughout the data collection process.

Consent for publication
Written informed consent was obtained from all participants for the publication of this case series. A copy of the consent form is available for review by the Editor-in-Chief of this journal upon request.

Competing interests
The authors declare no competing interests.

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