EGAS MONIZ SCHOOL of HEALTH & SCIENCE

# INSTITUTO UNIVERSITÁRIO EGAS MONIZ

## MESTRADO EM PSICOLOGIA CLÍNICA E DA SAÚDE

**Al Haouz earthquake (Morocco, 2023): Analysis of the long-term psychological impact and coping strategies among residents of the region according to their environment and experience**


Trabalho submetido por

**Hiba Touhami**


para a obtenção do grau de Mestre em Psicologia Clínica e Saúde

**julho de 2025**

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Trabalho orientado por

**Marta Sofia Pereira Dos Reis**


Julho de 2025

EGAS MONIZ SCHOOL of HEALTH & SCIENCE

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NIF 504 218 611

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University Campus - Quinta da Granja
2829-511 Monte da Caparica, Portugal

NIF 504 218 611

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## Abstract

The present study examined the long-term psychological consequences of the Al Haouz earthquake (September 8, 2023) by assessing the prevalence of posttraumatic stress disorder (PTSD) and the coping strategies adopted by affected populations. Using a mixed-methods design, data were collected from 394 participants through a structured questionnaire—including the PCL-5—and from 20 semi-structured interviews conducted in highly exposed rural areas. Quantitative analyses indicated that 35.3% of participants met criteria for probable PTSD. Higher symptom severity was observed among women, rural residents, individuals with low educational attainment, and those who experienced major material damage or bereavement. Problem-focused and positive spiritual/religious coping strategies were associated with lower PTSD symptoms, whereas avoidance and dysfunctional strategies were linked to elevated distress.

Qualitative findings highlighted the roles of spiritual meaning-making, community solidarity, and shifting life priorities in supporting resilience, while structural inequalities and limited access to mental health services contributed to ongoing psychological vulnerability. Taken together, the results underscore the need for culturally grounded, community-based psychosocial interventions that integrate local cultural and spiritual resources. This study provides one of the first systematic examinations of post-disaster mental health in the Al Haouz region and contributes to a broader understanding of trauma recovery in low-resource and culturally diverse contexts.

**Keywords:** Al Haouz earthquake , Post-traumatic stress disorder (PTSD) , Coping , Mental health disparities , sociocultural , vulnerability , Morocco.

**Resumo**

O presente estudo examinou as consequências psicológicas de longo prazo do sismo de Al Haouz (8 de setembro de 2023), avaliando a prevalência de perturbação de stress pós-traumático (PTSD) e as estratégias de coping adotadas pelas populações afetadas. Utilizando um desenho de métodos mistos, foram recolhidos dados de 394 participantes através de um questionário estruturado — incluindo a escala PCL-5 — e de 20 entrevistas semiestruturadas realizadas em zonas rurais de elevada exposição. As análises quantitativas indicaram que 35,3% dos participantes cumpriam os critérios para provável PTSD. Sintomas mais elevados foram observados entre mulheres, residentes em áreas rurais, indivíduos com baixo nível de escolaridade e participantes que experienciaram perdas humanas ou danos materiais severos. Estratégias de coping centradas no problema e estratégias espirituais/religiosas positivas associaram-se a níveis mais baixos de PTSD, enquanto estratégias de evitamento e coping disfuncional se associaram a maior sofrimento psicológico.

Os dados qualitativos evidenciaram o papel do significado espiritual, da solidariedade comunitária e da reavaliação das prioridades de vida na promoção da resiliência, enquanto desigualdades estruturais e o acesso limitado a serviços de saúde mental contribuíram para vulnerabilidade persistente. Em conjunto, os resultados sublinham a necessidade de intervenções psicossociais comunitárias, culturalmente adaptadas e integradas nos recursos locais. Este estudo fornece uma das primeiras análises sistemáticas da saúde mental pós-desastre na região de Al Haouz e contribui para uma compreensão mais ampla dos processos de recuperação psicológica em contextos culturalmente diversos e com poucos recursos.

**Palavras-chave:** Terramoto de Al Haouz, Transtorno de stress pós-traumático (PTSD), Enfrentamento, Disparidades na saúde mental, Sociocultural, Vulnerabilidade, Marrocos.

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## List of abbreviations

**PTSD :** Post-Traumatic Stress Disorder

**DSM-5 :** Diagnostic and Statistical Manual of Mental Disorders – 5th Edition

**EPICENTER :** Point of origin of the Earthquake

**PCL-5 :** PTSD Checklist for DSM-5

**PCL-B :** PCL-5 Criterion B Score

**PCL-C :** PCL-5 Criterion C Score

**PCL-D :** PCL-5 Criterion D Score

**PCL-E :** PCL-5 Criterion E Score

**IR :** Immediate Reaction

**LT :** Long-Term

# 1. INTRODUCTION

On September 8th, 2023, a powerful earthquake struck the Al Haouz region in Morocco, causing severe damage to infrastructure, widespread human losses, and long-term disruption to community life. In addition to the physical devastation, such natural disasters often lead to significant psychological consequences, particularly in vulnerable populations with limited access to mental health services.

Natural disasters are known to produce long-term mental health challenges, including symptoms of anxiety, depression, and post-traumatic stress disorder (PTSD) (Neria et al., 2008; Goldmann & Galea, 2014). In many affected contexts, these psychological outcomes are compounded by sociocultural dynamics, including stigma around mental health, religious beliefs, gender roles, and the strength or absence of community support networks. In Morocco, limited mental health infrastructure and cultural barriers to psychological care contribute to underreporting and undertreatment of mental health problems. In rural or traditional communities, traumatic experiences are often internalised or interpreted through non-clinical frameworks, delaying or obstructing access to care (WHO, 2023).

Although several international studies have examined the psychological consequences of earthquakes, few have focused on North African countries, and even fewer have explored the intersection between sociocultural factors and environmental trauma. The Al Haouz earthquake therefore offers a unique and urgent opportunity to explore how these layers interact.

This research aims to explore the long-term psychological impact of the Al Haouz earthquake on affected individuals, taking into account the sociocultural and environmental context in which the disaster occurred. Using a mixed-methods design, the study combines quantitative measures of psychological distress with qualitative interviews to understand how survivors perceive, process, and cope with the consequences of the earthquake.

The results of this study are expected to contribute to the understanding of trauma in low-resource and culturally diverse settings, and to inform culturally sensitive mental health responses to natural disasters.

# 2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

## 2.1. Psychological Impact of Natural Disasters

While the physical damage caused by natural disasters is often immediate and visible, their emotional consequences are more insidious and long-lasting. Indeed, natural disasters can have devastating psychological consequences, including symptoms of post-traumatic stress disorder (PTSD), depression, anxiety, and somatic complaints. These effects may persist long after physical reconstruction occurs and can undermine the social and emotional functioning of affected populations (Neria et al., 2008; Bonanno et al., 2010).

Earthquakes, in particular, carry a unique psychological burden. Their suddenness, unpredictability, and violent intensity strip individuals of their basic sense of safety and control, often triggering intense emotional responses (Goldmann & Galea, 2014).

Over the past two decades, numerous studies have highlighted the broad psychological consequences of natural disasters. The emotional aftermath of such disasters often includes reactions that may surface days, weeks, or even months after the event, disrupting daily life and overall well-being. Survivors report symptoms of acute stress, anxiety, depression, and, in a significant number of cases, post-traumatic stress disorder (PTSD). This disorder has been especially prevalent following major earthquakes due to the convergence of life-threatening danger, profound losses, and a lack of support structures or inadequate intervention. These effects tend to be more severe in structurally vulnerable contexts particularly in vulnerable areas where access to psychological care is limited and where populations are already facing social or economic precarity

Symptoms of PTSD following earthquakes commonly include intrusive memories, avoidance of reminders, persistent negative emotions or cognitions, and hyperarousal (APA, 2013). As described in the DSM-5, these criteria are captured by tools such as the PCL-5 (Bovin et al., 2016). Studies have shown that intrusive symptoms such as flashbacks and nightmares can dominate daily life, while avoidance

and cognitive changes lead to social withdrawal, emotional numbing, and persistent guilt (Foa et al., 2019; Bryant et al., 2011). Hyperarousal, including insomnia, hypervigilance, or exaggerated startle responses, can impair daily functioning and prolong recovery.

Global studies report PTSD prevalence rates ranging from 5% to over 40% among disaster-exposed populations, with higher rates in low- and middle-income countries (Neria et al., 2008). In Morocco, a study conducted after the 1960 Agadir earthquake found that approximately 39% of survivors met criteria for PTSD in the immediate aftermath, and 10% continued to show symptoms even four decades later (Kadri et al., 2006). Preliminary data following the 2023 Al Haouz earthquake suggest similarly elevated risks, with mental health teams estimating that up to 25% of affected individuals were at high risk for PTSD (Amara et al., 2024).

Several factors increase the likelihood of developing PTSD after an earthquake. One of the main determinants is the intensity of the earthquake, this includes in particular the human and material losses suffered (Amara et al., 2024). Losing a family member or close friend in an earthquake is a traumatic event that greatly exacerbates the risk of developing PTSD. Grieved people find themselves managing not only their own experience of the earthquake, but also the grief associated with the loss, which can aggravate the symptoms of psychological distress. In addition, people living near the earthquake epicenter are more likely to experience severe trauma, because they have experienced more intense shocks and damage. History of psychological disorders increases vulnerability to PTSD, which can even worsen the stress response and make the recovery process more difficult (Kessler et al., 2017). Finally, social support plays an important role because of its ability to mitigate the traumatic effects of an earthquake. Conversely, social isolation or lack of support increases the risk of developing PTSD. A study after the Christchurch earthquake in New Zealand showed that survivors receiving adequate social support had significantly lower levels of PTSD than those who were isolated (Brooks et al., 2017).

Social support, by contrast, serves as a major protective factor. Survivors who feel emotionally supported by family or community tend to experience lower levels of distress and recover more quickly (U.S. Department of Veterans Affairs, 2022).

## 2.2. Economic, Social and Structural Determinants of Vulnerability in Natural Disasters

Natural disasters, whether seismic, climatic or environmental, can have multidimensional repercussions on the populations affected. Their impact is multidimensional: physical, health and material, economic, sociological and psychological.

Natural disasters tend to exacerbate pre-existing social and economic inequalities, intensifying both physical destruction and psychological harm. Lower-income communities often reside in poorly constructed housing and lack financial reserves, increasing both exposure and hardship during recovery (Norris et al., 2002). Resource loss such as housing, income, or family livelihood has been directly associated with the onset and severity of post-traumatic stress symptoms (Cohen et al., 2019). In disaster contexts, the inability to regain basic stability can prolong psychological distress.

In Morocco, these vulnerabilities are especially acute in rural regions such as Al Haouz, where infrastructural limitations, poverty, and geographic isolation converge. Mental health services in these areas are scarce, with most facilities concentrated in urban centers (Khan et al., 2025). Furthermore, social stigma and cultural beliefs about mental illness, such as attributing psychological symptoms to supernatural causes often delay care-seeking (Kadri et al., 2006). These structural and cultural barriers contribute to the long-term psychological burden following disasters.

## 2.3. Resilience and Coping Strategies in Post-Disaster Contexts

Resilience refers to the capacity of individuals and communities to recover and adapt after adversity (Masten, 2001). It is not a static trait but a dynamic process shaped by individual resources, social networks, cultural norms, and environmental stability

(Luthar et al., 2000). Coping refers to the cognitive and behavioral efforts deployed to regulate emotional responses or solve problems generated by adversity. According to the transactional model of stress and coping (Lazarus & Folkman, 1984), coping strategies can be broadly categorized into problem-focused coping and emotion-focused coping. Emotion-focused coping, includes accepting reality, seeking emotional support, using humor, positive reframing or turning to religion. Problem-focused coping includes behaviors such as taking direct action, planning or seeking instrumental support to resolve the situation.

While both forms can be adaptive, the effectiveness of a coping strategy depends on the context and the individual's resources. Some people adopt dysfunctional coping strategies, manifesting themselves in behaviors such as ignoring the existence of the problem, distraction, substance abuse, blaming themselves or over-expressing their negative emotions (venting). These strategies can often worsen psychological distress and delay the resilience process (Carver, 1997; Aldao et al., 2017). Moreover, these behaviors increase the risk of anxiety and depressive disorders, particularly after major traumatic events (Aldao et al. 2017).

In Islamic and North African contexts, coping is strongly shaped by religious and cultural values. In Moroccan society, religious beliefs and spiritual values are deeply interwoven with understandings of illness, suffering, and healing. In disaster contexts, faith can provide meaning, hope, and emotional regulation (Koenig, 2009; Al-Krenawi & Graham, 2000). The concept of *sabr* (patience) and trust in *qadar* (divine will) are often used to frame suffering as a spiritual trial.

This religious framing can serve as a protective factor, promoting acceptance and resilience (Aydın et al., 2025). However, it can also delay or replace professional help-seeking, especially when distress is interpreted as a spiritual affliction or punishment. Individuals may turn to prayer, imams, or traditional healers before considering clinical support (Fernando, 2012; Kirmayer et al., 2011).

Gender roles influence mental health experiences. In rural Moroccan communities, women often bear caregiving burdens and may face restricted autonomy and increased

exposure to gender-based violence during emergencies (WHO, 2021). At the same time, they are often emotional anchors in families and provide informal support.

The stigma surrounding mental illness, combined with social norms about privacy and family honour, further impedes help-seeking. This can exacerbate psychological suffering and delay early intervention (Kadri et al., 2006).

## 2.4. The Al Haouz Earthquake (2023)

The 2023 Al Haouz earthquake, which struck central Morocco on September 8, was the most destructive earthquake in the country in over sixty years. It caused around 3000 deaths and displaced tens of thousands, particularly in the mountainous High Atlas region. The physical destruction was severe, particularly in rural villages where homes were made of traditional adobe or stone materials not designed to withstand seismic activity. Infrastructural damage, combined with the region's geographical isolation, delayed emergency response and left many survivors without access to basic services during the critical first days (Khan et al., 2025). According to the World Bank (2023), the economic losses exceeded $10 billion, disrupting not only private households but also vital public services such as schools and health centers. This event revived the collective memory of the 1960 Agadir earthquake, which caused over 12,000 deaths and marked a turning point in Morocco's urban planning and emergency response systems. The social response to the disaster was marked by strong prosocial behavior and solidarity. Community members mobilized to rescue neighbors, share resources, and organize improvised shelters. National and international humanitarian organizations, including the Moroccan Red Crescent, UNICEF, and Médecins Sans Frontières, provided Psychological First Aid, created child-friendly spaces, and facilitated counseling services in some of the hardest-hit areas (Médecins Sans Frontières, 2023).

The Al Haouz earthquake thus also reveals systemic weaknesses in mental health infrastructure and the need for integrated, long-term strategies to support psychological recovery. Indeed, even before the earthquake, Morocco faced major gaps in mental health provision. Most mental health facilities are concentrated in urban centres, leaving rural populations without specialised care. This disparity is

compounded by cultural stigma, poverty, and high illiteracy rates, which inhibit access to available services (Kadri et al., 2006).

## 2.5. Importance of Post Disaster Psychological Care

Post-disaster psychological support is a crucial component of recovery, yet it often remains underdeveloped, particularly in low- and middle-income countries. In Morocco, mental health services were already limited prior to the Al Haouz earthquake. The country's mental health infrastructure is concentrated in urban areas, with rural regions such as the High Atlas facing severe shortages in mental health professionals and facilities (Khan et al., 2025). This uneven distribution, coupled with cultural stigma surrounding psychological distress, impedes access to care for survivors who may need it most (Kadri et al., 2006). Effective post-disaster care must be culturally adapted and community-based. International guidelines, including those from the Inter-Agency Standing Committee (IASC), recommend a multi-layered system of psychosocial support. This includes ensuring basic needs and safety, strengthening community and family support, providing non-specialized psychological interventions, and making specialized services available for those with severe mental health conditions (World Health Organization [WHO], 2013). In the Moroccan context, culturally sensitive interventions must consider spiritual beliefs and local norms. Involving religious leaders, using local languages and dialects, and addressing stigma through trusted community channels can improve the acceptability and uptake of services (Aydın et al., 2025).

# 3. AIMS OF THE STUDY AND HYPOTHESES

## 3.1. Relevance and research questions

In recent years, the psychological aftermath of natural disasters has become a growing focus of international research. However, generalizing across different events remains problematic. The emotional and cognitive responses to trauma are never uniform, they are shaped by the socio-cultural fabric, the level of preparedness, the historical background, and the structural conditions in which a disaster occurs. Each earthquake, though sharing certain universal elements of disruption and fear, unfolds within a unique ecosystem of meaning, vulnerability, and resilience.

The earthquake of September 8, 2023, caused significant human and material losses, eliciting not only subjective resilience responses but also a heavy emotional impact. It also affected individuals differently, depending on their age, sex, place of residence, socio-economic situation and the direct or indirect losses suffered. To date, there are few scientific studies analyzing the long-term psychological impact of this event on victims.

This study aims to explore the psychological consequences of the 2023 Al Haouz earthquake, with a particular focus on the development and evolution of post-traumatic stress symptoms. It seeks to identify both the risk factors that may exacerbate emotional vulnerability and the protective elements that support resilience over time. The research will also examine how individuals cope with trauma in this context including the use of cognitive, behavioral, social, and spiritual strategies and how perceived support influences psychological outcomes.

This study seeks to explore the psychological consequences of the 2023 Al Haouz earthquake, with particular emphasis on the onset, intensity, and progression of post-traumatic stress symptoms.

How did the earthquake of September 8, 2023, influence the onset and evolution of PTSD symptoms in people who experienced the event?

What individual or contextual risk factors are associated with the development of PTSD symptoms (gender, age, history, socio-economic level,...)?

Which groups appear to be the most psychologically vulnerable to the development of long-term post-traumatic symptoms?

How does the level of exposure including proximity to the epicenter and the type of damage correlate with the intensity of psychological distress?

To what extent do social and familial responses, as well as perceived support, influence resilience or psychological vulnerability?

What are the dominant Immediate reactions and long term strategies used by participants to cope with the consequences of the event? How do these strategies vary across demographic and contextual profiles?

## 3.2. Scientific and Social Relevance

This issue arises in a context where post-traumatic stress disorder (PTSD) remains largely under-diagnosed, particularly in certain vulnerable contexts and areas. The limited availability of psychological services, combined with logistical constraints and persistent stigma surrounding mental health, creates significant barriers to care. In such contexts, survivors often rely on informal networks such as family, community or faith to navigate trauma. The Al Haouz earthquake has laid bare the urgent need to better understand how these populations process and respond to large-scale emotional shock in the absence of structured psychological support.

The main objective of this study is to document and understand how individuals who have been affected by this experience have developed symptoms of post-traumatic stress, taking into account the various variables that can be involved. Such as gender, age, socio-economic level, place of residence (rural or urban), proximity to the epicenter and the nature of the losses suffered (human and/or material). Beyond mapping symptoms, the study also aims to explore the strategies adopted by survivors to cope with trauma. These may be cognitive, behavioral, relational , or spiritual . Understanding how individuals mobilize internal and external resources can help identify which factors foster long-term psychological recovery.

In addition, this research has several scientific and social interests. On the theoretical side, it contributes to the literature on PTSD in the context of natural disasters such as this one. At the same time, it highlights the specific situation in the context of a developing country like Morocco, where mental health services are still unequally distributed. It also brings a culturally contextualized perspective on PTSD, highlighting how social norms, collective practices, and belief systems shape trauma expression and management. It also brings a culturally contextualized perspective on PTSD, highlighting how social norms, collective practices, and belief systems shape trauma expression and management.

Practically, the results may guide the development of more inclusive and responsive mental health interventions, especially in underserved areas. By identifying the most at-risk populations and their actual support needs, this study may inform national mental health strategies, improve NGO coordination, and support the implementation of community-based and trauma-informed care models and enrich the existing programs.

Finally, this study may underscore the urgent need for a more equitable allocation of psychological support resources in Morocco, particularly in regions that remain underserved by institutional care. It also aims to give visibility to populations whose psychological distress, although profound, is often marginalized in post-disaster recovery efforts.

### 3.3. Research hypotheses

This research is based on the general hypothesis that psychological responses to the earthquake of September 8, 2023, and in particular the development of symptoms of post-traumatic stress disorder (PTSD), vary according to socio-demographic, contextual and psychological factors.

In line with the objectives and axes explored, the following specific hypotheses are formulated:

**Hypothesis 1:** The development of PTSD symptoms and long-term impacts will be significantly higher among individuals living in rural areas, due to limited access to mental health services, geographical isolation, and weaker institutional support, compared to urban populations.

**Hypothesis 2:** Women will exhibit higher levels of post-traumatic symptoms than men, as well as greater use of emotion-focused coping strategies, due to cultural factors related to emotional expression and mental workload.

**Hypothesis 3:** Individuals who have suffered direct and severe losses (such as the death of a loved one, housing collapse, serious injury, or significant financial loss) will have significantly higher PTSD scores than those with indirect or less intense exposure.

**Hypothesis 4:** Geographical proximity to the earthquake epicenter will be positively correlated with the intensity of PTSD symptoms, with residents of the most affected areas showing greater psychological distress.

**Hypothesis 5:** Certain coping strategies, including seeking social support, professional help, and engaging in spiritual or religious practices, will be associated with lower levels of PTSD symptoms, acting as protective factors.

**Hypothesis 6:** Dysfunctional coping strategies (avoidance, denial, self-blame, substance abuse, isolation) will be associated with higher levels of psychological distress and PTSD symptoms.

**Hypothesis 7:** Individuals who have witnessed particularly traumatic events (death scenes, severe injuries, cries for help) without being directly injured themselves will present PTSD levels comparable to those who have suffered material or physical losses.

**Hypothesis 8:** Living in a heavily affected area (perceived as 'destroyed' or 'abandoned') may lead to a prolonged sense of insecurity, thereby aggravating or maintaining post-traumatic stress symptoms

# 4. METHODOLOGY

## 4.1. Research Design

This study employed a retrospective cross-sectional mixed-method design, integrating both quantitative and qualitative approaches to assess the long-term psychological impact of the 2023 Al Haouz earthquake. This design was selected to allow for a comprehensive analysis of mental health outcomes by combining numerical indicators of psychological distress with in-depth personal narratives of survivors. The use of mixed methods facilitated triangulation of results and offered a more nuanced understanding of individual and collective experiences, coping mechanisms, and resilience in a culturally specific post-disaster context.

## 4.2. Participants

### 4.2.1. Inclusion Criteria

Participants were adults aged 18 years or older who were directly or indirectly affected by the September 8, 2023, earthquake in the Al Haouz region. This included individuals from both urban and rural areas, as well as isolated mountainous zones, to enable comparisons based on exposure context and access to resources. This territorial distinction was essential to evaluate psychosocial disparities related to geographical isolation, socio-economic status, and availability of mental health services.

### 4.2.2. Sample Composition

An initial collection of 430 responses was gathered via an online questionnaire, available in both French and Arabic. These responses were subsequently unified and analyzed in English, following a consistent methodological approach.

Following the exclusion of 36 participants who reported no personal experience of an earthquake, the final analyzed sample consisted of 394 valid respondents.

The sample included a diverse range of participants in terms of gender, age, socio-economic background, and geographical location. Individuals resided in both urban and rural areas and reported varying degrees of exposure and loss related to the Al Haouz earthquake. Educational attainment and occupational status also varied

widely, allowing for comparative analyses across demographic and socio-environmental subgroups.

For the qualitative component, 20 participants were purposively selected based on variation in demographic and exposure profiles, as well as their agreement to participate in follow-up interviews. Some were recruited through the questionnaire (by indicating consent to contact), and others were identified during field visits in severely impacted rural zones. These interviews were conducted either in person in highly impacted regions or remotely, and aimed to explore subjective experiences, emotional responses, and coping strategies in greater depth.

## 4.3. Data Collection

### 4.3.1. Procédures

The data collection was structured in two complementary phases, integrating both quantitative and qualitative approaches to comprehensively assess the psychological impact of the Al Haouz earthquake.

The initial phase involved an online questionnaire, disseminated nationwide through a snowball sampling strategy. A visual flyer was developed to introduce the study and facilitate widespread distribution (Appendix A). The survey was shared across major digital platforms (Facebook, Instagram, WhatsApp, LinkedIn) and circulated within community groups, professional networks, and with the assistance of local associations and public figures. To ensure maximum inclusion, the questionnaire was provided in both French and Arabic. At the conclusion of the survey, participants were invited to indicate their willingness to participate in a follow-up interview.

The second phase consisted of semi-structured interviews conducted with a purposely selected subsample of participants. This selection was based on the diversity of their profiles, considering factors such as gender, age, exposure level, living environment, type of loss, symptom severity, and occupation. These interviews, conducted either remotely or face-to-face depending on logistical considerations, aimed to delve into participants' subjective experiences of the earthquake, their emotional and psychological responses, their utilization of individual and collective resources, and their feedback on recovery processes and psychosocial support. The interviews were

conducted in Arabic or French, depending on the participant's preference and guided by an open-ended protocol designed to capture rich narratives and contextual specificities.

To ensure the inclusion of individuals from regions with limited internet access or those underrepresented in the initial online sample, additional data was collected directly in the field. This involved on-site visits to highly impacted rural areas, particularly those near the epicenter. These field engagements allowed for greater inclusion of vulnerable populations and provided firsthand insights into the lived experiences of those most affected.

### 4.3.2. Instruments

The study used a combination of quantitative and qualitative tools to gather rich, objective and subjective data on the psychological impact of the earthquake and the long term strategies employed by those affected.

***Online questionnaire:***

A structured digital form covering sociodemographic characteristics, environmental exposure, and subjective experiences. It included standardized measures (PCL-5) as well as variables such as age, gender, living environment, socio-economic status, and losses suffered (human and material). It also covers perceptions of the earthquake, emotional experience, and development questions

***PTSD Checklist for DSM-5 (PCL-5):***

Validated French (Ashbaugh et al., 2016) and Arabic (Alhalaiqa & Alsadi, 2021) versions of the The PCL-5 (Weathers et al., 2013) were used withing the online survey depending on participants' language preference. It is an internationally validated self-assessment tool for measuring the severity of post-traumatic stress disorder (PTSD) symptoms according to DSM-5 diagnostic criteria. The 20-item scale evaluates PTSD criteria, with each item falling into one of four dimensions based on its criterion score. These four subscales align with the four symptom clusters for PTSD in the DSM-5.

Re-experiencing/Intrusions (Criterion B, items 1-5; max score = 20): Includes intrusive memories, nightmares, and flashbacks.

Avoidance (Criterion C, items 6-7; max score = 8): This involves attempts to avoid thoughts or situations related to the trauma.

Negative Cognitive and Emotional Changes (Criterion D, items 8-14; max score = 28): Covers symptoms such as persistent negative beliefs, distorted cognitions, negative emotional states, diminished interest in activities, feelings of detachment, and inability to experience positive emotions.

Hyperarousal (Criterion E, items 15-20; max score = 24): Relates to irritable behavior, self-destructive behavior, hypervigilance, exaggerated startle response, problems with concentration, and sleep disturbance.

Each item is scored on a scale from 0 (not at all) to 4 (extremely), with a total score ranging from 0 to 80. A total PCL-5 score of 33 or above is widely recognized as a clinically significant indicator of substantial PTSD symptoms that significantly impact an individual's daily functioning (Bovin et al., 2016; Krüger-Gottschalk et al., 2017; Rosendahl et al., 2019). The PCL-5 was administered in validated French and Arabic versions, based on participant preference.

### *Interviews*

A semi-structured interview guide developed to explore the lived experiences of participants before, during, and after the Al Haouz earthquake. The guide included seven thematic axes, informed by trauma literature and designed to elicit personal narratives across emotional, behavioral, social, and existential domains. It was used both for follow-up interviews with selected participants and to analyze open-ended questionnaire responses.

The main sections of the interview guide were as follows:

Earthquake Experience: Immediate context and reactions during the tremor (location, actions, emotions, presence of others).

Psychological and Emotional Impact: Emotional states in the hours/days/weeks after, and any lasting psychological or somatic changes (sleep, mood, memory, concentration).

Coping Strategies and protective factors that helped: Personal and social means of coping, including spiritual or behavioral mechanisms, help received, and perceived solidarity.

Long-Term Effects and Recovery: Ongoing symptoms, evolution over time, and sense of recovery.

Meaning and Reflection: Changes in worldview, life priorities, religious/spiritual meaning-making, and messages to others.

Additional Comments: Any other reflections the participant wished to share.

The open structure of the guide allowed for flexibility in adapting to each participant's narrative, while ensuring that all relevant dimensions were explored across interviews.

## 4.4. Data Analysis and Processing

### 4.4.1. Operationalization of Variables

All data collected through the online questionnaire were first screened and cleaned using Microsoft Excel to remove incomplete, duplicate, or invalid entries. This ensured the integrity of the dataset prior to statistical processing. The cleaned dataset was exported to IBM SPSS Statistics for grouping, and statistical analysis. The operationalization of key variables was guided by established standards in disaster psychology and public health.

#### *Immediate Emotional and Behavioral Reactions*

Participants reported their immediate responses to the earthquake via a multiple-response item. Responses were recoded into 11 binary categories (Yes/No), including intense fear or panic, crying or screaming, freezing, fleeing, taking shelter, physical symptoms (trembling, dizziness), helping others, remaining calm, delayed

reaction or shock, no perception of the tremor, and religious/spiritual invocation. Open-ended responses were reviewed and recoded when consistent (reciting the shahada or Quran was classified under spiritual coping).

To enhance interpretability and guide inferential analysis, these immediate reactions were grouped into five functional categories:

**Emotional/Somatic Reactions:** encompassing intense fear, panic, crying, and physical symptoms; aligned with acute stress responses and arousal-based symptoms.

**Active Behavioral Reactions:** including fleeing, helping others, taking shelter, and remaining calm; associated with proactive and regulated coping behaviors during crisis.

**Dissociative/Inhibited Reactions:** including freezing or delayed responses; considered markers of peritraumatic dissociation or inhibitory coping mechanisms.

**Spiritual/Religious Reactions:** derived from open-ended responses, these included explicit religious expressions (invoking God or reciting the shahada) and were coded as a separate category reflecting culturally embedded coping strategies.

**Other/Unclassified Reactions:** included rare or non-reactive responses, such as not perceiving the tremor, and were excluded from inferential analysis due to low frequency.

Each category was coded as a binary variable (0 = No, 1 = Yes), and participants could be included in multiple categories depending on their reported reactions. The full mapping of items and theoretical justification is presented in Table 1.

**Table 1:**

*Categorization of Immediate Reactions*

| Category | Immediate Reaction |
|---|---|
| **Emotional / Somatic** | Intense fear / panic / sudden anxiety |
| | Cried or screamed / strong emotional reaction |
| | Physical symptoms |
| **Active Behavioral** | Fled / attempted to flee immediately |
| | Took shelter |
| | Helped / reassured others |
| | Remained calm |
| **Dissociative / Inhibited** | Froze / unable to react |
| | Delayed reaction / shock |
| **Spiritual** | Spiritual / Religious reaction |
| **Other / Unclassified** | Did not perceive the tremor |

### *Long-Term Strategies*

Similarly, Long-term psychological adjustment strategies were assessed using items inspired by the Brief COPE (Carver, 1997). Responses were grouped into four theoretical categories based on the nature of the strategy:

Problem-focused strategies: active problem-solving, information seeking, instrumental support.

Emotion-focused strategies: religious coping, emotional expression, positive reframing, acceptance, meaning-making, humor.

Avoidance/dysfunctional strategies: denial, distraction, avoidance of reminders, substance use.

Stress-related symptoms: persistent emotional distress, intrusive thoughts, sleep disorders, cognitive fatigue.

This structure allowed for an analysis of adaptive versus maladaptive coping and their association with demographic variables and PTSD outcomes.

**Table 2:**

*Categorisation of Long Term Strategies*

| Category | Long-Term Strategy |
|---|---|
| **Problem-Focused** | Active management |
| | Educated about earthquakes |
| | Professional / instrumental support |
| | Emotional / social support |
| **Emotion-Focused** | Positive reframing |
| | Acceptance |
| | Positivism / humor |
| | Religion / spirituality |
| | Reflection / meaning of life |
| **Avoidance / Dysfunctional** | Tried to forget |
| | Avoided places / situations |
| | Keep busy / distract / avoid |
| | Denial |
| | Substance use |
| **Stress-Related** | Emotional distress / anxiety |
| | Sleep disorders |
| | Difficulty managing emotions |
| | Difficulty concentrating / fatigue |
| | Recurring intrusive thoughts |

### *PTSD Symptoms (PCL-5)*

The PCL-5 questionnaire closely mirrors the DSM-5-TR diagnostic criteria for PTSD. The scale is divided into four symptom clusters:

- Criterion B: Re-experiencing (items 1–5)
- Criterion C: Avoidance (items 6–7)
- Criterion D: Negative alterations in cognition and mood (items 8–14)
- Criterion E: Hyperarousal (items 15–20)

Each item was rated on a 5-point Likert scale (0–4), yielding total scores from 0 to 80. Based on clinical consensus , a total score of ≥ 33 was used to identify probable PTSD.

To evaluate PTSD symptom severity, average item scores were computed across the full scale and for each cluster. Based on guidelines from Bovin et al. (2016) , severity levels were categorized as follows:

- Normal (≤ 1.23): Minimal or no clinical symptoms.
- Mild (1.23–1.64): Low intensity with limited functional impact.
- Moderate (1.64–2.45): Moderate distress and partial dysfunction.
- Severe (2.45–3.26): Marked impairment across multiple domains.
- Extremely Severe (> 3.26): Debilitating symptoms requiring clinical intervention.

In SPSS, total and cluster severity scores were calculated using the MEAN function across relevant items, and recoded into ordinal variables using conditional logic. This allowed for both continuous and categorical analyses of PTSD severity and facilitated comparisons across demographic and exposure variables. Cluster-level scores (B, C, D, E) were treated similarly to detect variations in symptom profiles within subgroups.

### 4.4.2. Quantitative Analysis

Quantitative data were analyzed using IBM SPSS Statistics. The analysis plan combined descriptive, bivariate, and multivariate approaches to explore patterns of PTSD symptoms, Immediate reactions, long term strategies, and their predictors. Descriptive statistics (frequencies, means, standard deviations) were computed for all sociodemographic, exposure, and psychological variables. Chi-square tests of independence were used to examine associations between categorical variables, particularly the relationship between PTSD caseness or symptom severity and factors such as gender, age group, education, area type, distance from the epicenter, and type of damage. Independent-samples t-tests and one-way ANOVAs were conducted to compare mean PCL-5 scores across different groups. Where assumptions of normality and homogeneity of variance were met, effect sizes were reported to assess the practical significance of group differences. Multiple linear regressions were used to identify significant predictors of PTSD total severity and symptom cluster scores (B to E). A binary logistic regression model was also conducted to predict probable PTSD diagnosis (PCL-5 $\geq$ 33) from sociodemographic and contextual variables, including gender, age, academic level, area type, occupation, type of damage, and distance from the epicenter.

For composite variables such as long-term coping strategies and immediate reactions, binary-coded groups were created based on theoretical models and validated frameworks (Brief COPE). These were used as independent variables or moderators in several analyses. In addition, interaction terms such as Gender × Age and Distance × Area Type were constructed to assess combined vulnerability profiles and their relation to PTSD outcomes. All significance thresholds were set at $p < .05$, and all analyses were conducted on the final sample of 394 respondents.

### 4.4.3. Qualitative Analysis

The qualitative component of this study was conceived to complement and enrich the quantitative findings and deepen the understanding of individual and collective psychological responses to the Al Haouz earthquake. While statistical analyses allowed for the identification of patterns, associations, and risk factors for

post-traumatic stress disorder (PTSD), the qualitative strand provided a complementary subjective and contextual perspective to the quantitative results by exploring the lived experiences, subjective perceptions, and personal meanings attributed to the disaster and its aftermath. This dual approach respects the complexity of psychological trauma and ensures that participant voices are represented beyond numerical aggregation. The qualitative data included two sources, open-ended responses collected within the online questionnaire (n = 85), and semi-structured interviews with selected participants (n = 20). A total of 85 valid free-text responses were extracted and analysed from the open-ended questions in the online questionnaire including, Immediate reactions (Q3.1: "How did you react in the immediate aftermath?"), Long Term strategies in the weeks following the event (Q3.2) and the final optional reflections and current perspectives (Q5.3).

Twenty semi-structured interviews conducted with participants selected for their geographic diversity, degree of exposure, and richness of narrative. These included NGO volunteers, survivors in high level exposure rural zones, high level damage, and health and mental health professionals.

A manual thematic content analysis was conducted using Microsoft Excel. First, The interviews helped build a list with all the emergent common themes and pertinent ones. Similarly, each qualitative response from the questionnaire was read carefully and copied into a new spreadsheet. Meaningful units were delimited line by line and assigned unique row numbers, each linked to the respondent's survey number. Second, in the initial coding phase, relevant excerpts were coded inductively, allowing analytical categories to emerge directly from participants' own language. A preliminary codebook was developed from the 20 semi-structured interviews and refined iteratively. New provisional codes were created when segments did not fit existing categories. Codes were grouped into broader thematic clusters based on their recurrence, semantic similarity, and psychological relevance. This process led to the emergence of key themes such as disorientation and protective reflexes, somatic symptoms and hypervigilance, spiritual meaning-making, solidarity and social support, mental health

awareness, and existential re-evaluation. Each theme was clearly defined and supported by illustrative quotations selected to reflect their emotional and cultural resonance. Finally, themes were interpreted in light of the research objectives and triangulated with quantitative findings to enrich and contextualize the overall understanding of trauma response and recovery processes following the earthquake. Participant anonymity was preserved through pseudonymisation. Translated excerpts are rendered as faithfully as possible to the original phrasing to retain tone, cultural references, and psychological nuance.

**Table 3:**

*Thematic Coding Framework for qualitative analysis*

| Theme | Indicative themes |
|---|---|
| **Disorientation and Protective Reflexes** | Sensory confusion and stunned reaction- Freezing or immobility- Instinctive escape and self-protection- Immediate search for safety or to protect loved ones- Helping others during or after the tremor |
| **Spiritual Meaning-Making and Existential Awakening** | Saying prayers (shahada); reference to divine will; sense of destiny; spiritual awakening; spiritual coping; reassessing priorities through faith; reliance on God's mercy. |
| **Persistent Somatic and Hyperarousal Symptoms** | Sleep disturbance; nightmares; palpitations; sound triggers (sirens, metallic noises); fear of recurrence; sensory alertness; panic attacks; bodily symptoms (vomiting, tremors); reliving sensations. |
| **Solidarity and Institutional support** | Community mobilisation; mutual aid; volunteering; local or national solidarity; disappointment with governmental response; frustration with aid management; inequality in distribution. |
| **Mental Health Awareness and Emotional Openness** | Seeking therapy; use of medication; destigmatisation of psychological help; emergence of public discourse on trauma; intergenerational openness to mental health support; trust in professionals; Psychoeducation. |
| **Existential Reassessment and Life Priorities** | Re-evaluating life priorities; questioning materialism; sense of ephemerality; gratitude for survival; renewed meaning in family, solidarity, and personal values; reprioritisation of what matters. |

## 4.5. Ethical Considerations

Given the sensitivity of the subject matter and the potential vulnerability of some participants, particular attention was paid to informed consent, confidentiality, emotional safety, and cultural appropriateness throughout all phases of the study. Prior to participation, all respondents were provided with a clear and accessible explanation of the study's purpose, procedures, and potential risks. Participation was entirely voluntary. In the case of the online questionnaire, an informed consent question was presented at the outset, and participants were required to provide explicit agreement before proceeding. For the qualitative phase, consent was obtained either in written

form or orally, depending on the context. Where logistical factors made written consent impractical, oral consent was recorded prior to the start of the interview. Participant anonymity was strictly maintained. No identifying information was collected, and all responses were anonymized, securely stored, and used exclusively for academic purposes. Participants were informed of their right to withdraw at any time without providing justification.

The study addressed post-traumatic stress symptoms and emotional responses following a large-scale natural disaster. Although the potential risk to participants was minimal, the possibility of emotional discomfort or distress, particularly during qualitative interviews, was anticipated. Sensitive topics were approached with caution, and participants exhibiting signs of psychological vulnerability were gently encouraged to seek professional support.

To ensure linguistic accessibility and minimize comprehension bias, all research materials were available in both French and Arabic (Darija). Questionnaire items and interview questions were carefully adapted to reflect local linguistic and cultural norms. During fieldwork, a respectful and empathetic stance was adopted, mindful of the potential power imbalances inherent in post-disaster contexts.

Finally, potential methodological limitations such as social desirability bias, sampling bias, and inequalities in digital access were acknowledged. Efforts were made to address these issues by combining online and in-person recruitment strategies, thereby enhancing the inclusiveness and representativeness of the sample.

# 5. RESULTS

## 5.1. Quantitative Results

This section presents the quantitative findings of the study based on responses collected through an online questionnaire. As previously explained in the Method section, participants who reported never having experienced an earthquake were automatically excluded from the analysis, as the questionnaire was terminated upon selecting that option. The analysis is conducted among the cleaned sample (N=394).

The vast majority of participants (97.5%) reported having been directly affected by the Al Haouz earthquake, which occurred on September 8, 2023. A small minority (2.5%) indicated exposure to other traumatic seismic events, such as the Agadir earthquake (1960), the Al Hoceima earthquakes (2004 and 2010), or other natural disasters occurring in regions such as Algeria, Indonesia, or Dubai.

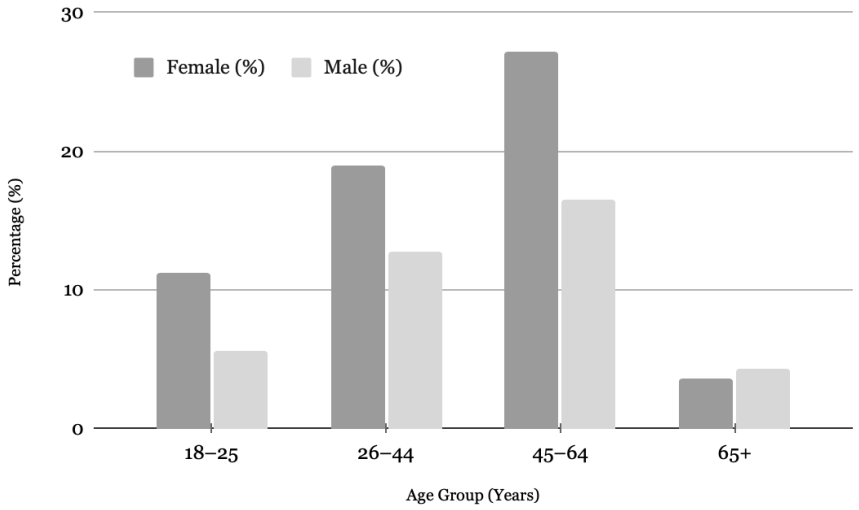
### 5.1.1. Demographic characteristics

The final sample consisted of 394 participants, including 60.9% women (n = 240) and 39.1% men (n = 154), indicating a moderate gender imbalance. Participants were predominantly middle-aged, with 43.7% aged 45–64 and 31.7% aged 26–44. Younger adults (18–25, 16.8%) and older participants (65+, 7.9%) were less represented.

To explore intersectional patterns, gender was cross-tabulated with age groups (Figure 1). Women were more represented in all age categories, particularly among those aged 45–64 (27.2%), while men followed the same distribution pattern but in smaller proportions.

In terms of marital status, the majority of respondents were married (56.9%), followed by single individuals (34.5%). Smaller proportions were widowed (4.8%) or divorced (3.8%).

***Figure 1.*** *Gender by Age Group ( N = 394).*




Note. The figure displays the proportion of men and women within each age group, highlighting the predominance of middle-aged women in the sample.

### 5.1.2. Socio-economic and Educational status

Participants reported diverse occupational and educational backgrounds, reflecting a range of socio-economic conditions. As shown in Table 4, almost one quarter (24,6 %) of respondents were unemployed, students, or inactive, and 15,5 % were manual or low-skilled workers. Skilled professionals (20,1 %) and highly qualified participants such as managers, engineers, or liberal professionals (22,8 %) represented the largest active categories. Smaller groups included self-employed participants (5,6 %) and retirees (11,4 %).

Regarding education, most participants had completed university-level studies (64,2 %), followed by secondary or high school (15,0 %), baccalaureate (8,4 %), primary education (7,9 %), and no formal education (4,6 %).

**Table 4**

*Socio-economic characteristics of the Sample (N = 394)*

| Characteristic | % |
|---|---|
| **Occupational Status** | |
| Unemployed / Student / Inactive | 24,6 |
| Manual / Low-Skilled Worker | 15,5 |
| Skilled Worker / Professional | 20,1 |
| Highly Qualified / Liberal / Engineer / Doctor | 22,8 |
| Self-Employed / Business Owner | 5,6 |
| Retired | 11,4 |
| **Academic Level** | |
| No education | 4.6 |
| Primary | 7.9 |
| Secondary/High School | 8.4 |
| Baccalaureate | 15.0 |
| University | 64.2 |

*Note.* Percentages represent the proportion of participants reporting each occupational or educational level.

### 5.1.3. Exposure Characteristics

Nearly half of the respondents (44.9%, n = 177) were situated between 50 and 100 kilometers from the epicenter, while 21.6% (n = 85) were within 10–50 km, and 20.8% (n = 82) were more than 250 km away. A smaller proportion reported living within 10 km (5.8%, n = 23) or 100–250 km (5.3%, n = 21) from the epicenter. A few respondents (1.5%) were unsure or selected “Other.”

In terms of area type, 62.9% of participants lived in urban zones, while 37.1% were based in rural regions. During the earthquake, a majority (51.5%) were located inside ground-level areas (home, courtyard, or terrace), followed by 27.4% on upper floors, and

17.3% in outdoor spaces. Only a small fraction were in public institutions (2.3%) or vehicles (less than 1%).

Regarding social context, most participants (66.5%) experienced the event with family, 20.1% were with friends or neighbors, 7.4% were alone, and 6.1% reported other configurations.

Material and human impacts were also assessed. While 35.8% of participants reported no damage, 28.7% experienced minor structural issues, 2.5% reported moderate damage, and 10.4% suffered from major destruction, such as collapsed buildings. Human consequences included the loss of a family member (8.9%), physical injury (7.1%), and financial loss (6.6%). These data underscore the layered and diverse consequences of the earthquake, encompassing physical, emotional, and economic harm.

**Table 5 :**

*Exposure Characteristics of Participants During the Earthquake (N = 394)*

| Variable | Category | % |
|---|---|---|
| **Distance from Epicenter** | <10 km | 5.8% |
| | 10–50 km | 21.6% |
| | 50–100 km | 44.9% |
| | 100–250 km | 5.3% |
| | >250 km | 20.8% |
| | Other / Unknown | 1.5% |
| **Area Type** | Urban | 62.9% |
| | Rural | 37.1% |
| **Location During Earthquake** | Indoors (ground floor/courtyard) | 51.5% |
| | Indoors (upper floor) | 27.4% |
| | Outdoor / open space | 17.3% |
| | Public institution | 2.3% |

| | | |
|---|---|---|
| | In a vehicle | 1.5% |
| **Social Context** | With family | 66.5% |
| | With friends or neighbors | 20.1% |
| | Alone | 7.4% |
| | Other | 6.1% |
| **Type of Damage / Impact** | No damage | 35.8% |
| | Minor material damage | 28.7% |
| | Moderate material damage | 2.5% |
| | Major material damage | 10.4% |
| | Family death | 8.9% |
| | Physical injury | 7.1% |
| | Financial loss | 6.6% |

### 5.1.4. Immediate Reactions

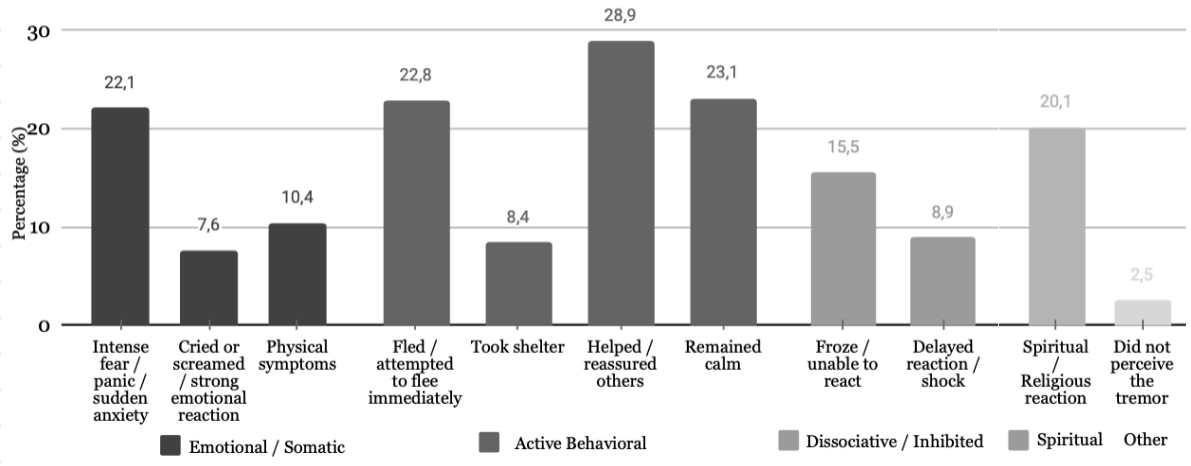
Participants were asked to identify their immediate emotional or behavioral responses during the earthquake by selecting presented options. An emergent category was identified from open-ended responses. Specifically, 11.2% of participants who selected "Other" described a religious or spiritual reaction, such as reciting the Shahada or referring to the Quran. Due to their frequency and thematic coherence, these responses were recoded into a new binary variable (0 = absent; 1 = present), labeled “Spiritual/Religious Reaction” and integrated into the quantitative analysis.

To facilitate interpretation and subsequent statistical testing, individual reactions were grouped into five functional categories. Each participant could endorse multiple categories. As shown in Figure 2, active behavioral reactions were most frequent (64,5 %), followed by emotional/somatic (34,3 %), dissociative/inhibited (22,6 %), and

spiritual/religious reactions (20,1 %). Other unclassified responses, such as not perceiving the tremor, were rare (2,5 %).

The predominance of action-oriented behaviors like helping others (28,9 %), remaining calm (23,1 %), or attempting to flee (22,8 %), suggests that many participants adopted functional responses to immediate threat. Emotional/somatic reactions, such as fear (22,1 %) or panic, were also common, particularly among women and younger adults. In contrast, dissociative and spiritual responses appeared more evenly distributed across the sample.

***Figure 2.*** *Immediate Reactions and Sub-Categories Following the Earthquake (N = 394).*




### *Gender and Age Differences in Immediate Reactions*

A cross-tabulation analysis examined differences by gender and age group. Emotional/Somatic reactions were significantly more frequent among women (39.2%) than men (26.6%) ($\chi^2(1, N = 394) = 6.55$, $p = .010$), and among younger participants ($\chi^2(3) = 11.85$, $p = .008$). Young women (18–25) were particularly affected, as confirmed by a significant interaction (Gender × Age Group), $\chi^2(7, N = 394) = 18.87$, $p = .009$.
In contrast, Active Behavioral, Dissociative, and Spiritual/Religious reactions did not show significant variation across gender or age groups (all $p > .10$), suggesting more uniform distribution of those strategies across the sample.

### 5.1.5. Long - Term Strategies

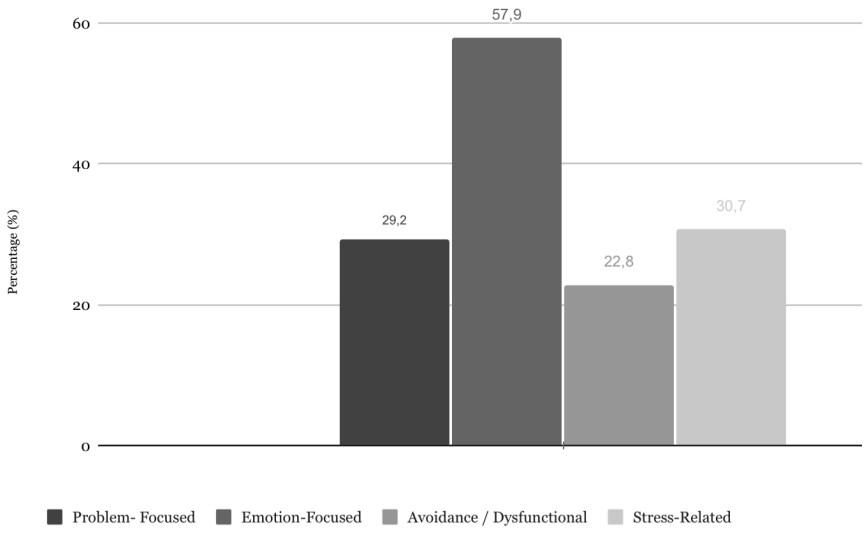
Descriptive statistics of long term strategies revealed a wide range of long term impacts, which were subsequently grouped into four theoretical categories (see Figure 3). The most frequently endorsed group was emotion-focused strategies, reported by 57.9% of participants. This category included approaches such as religious or spiritual strategies (26.0%), reflection on the meaning of life (21.6%), positive reframing (20.9%), acceptance (14.0%), and the use of humor or optimism (11.7%).

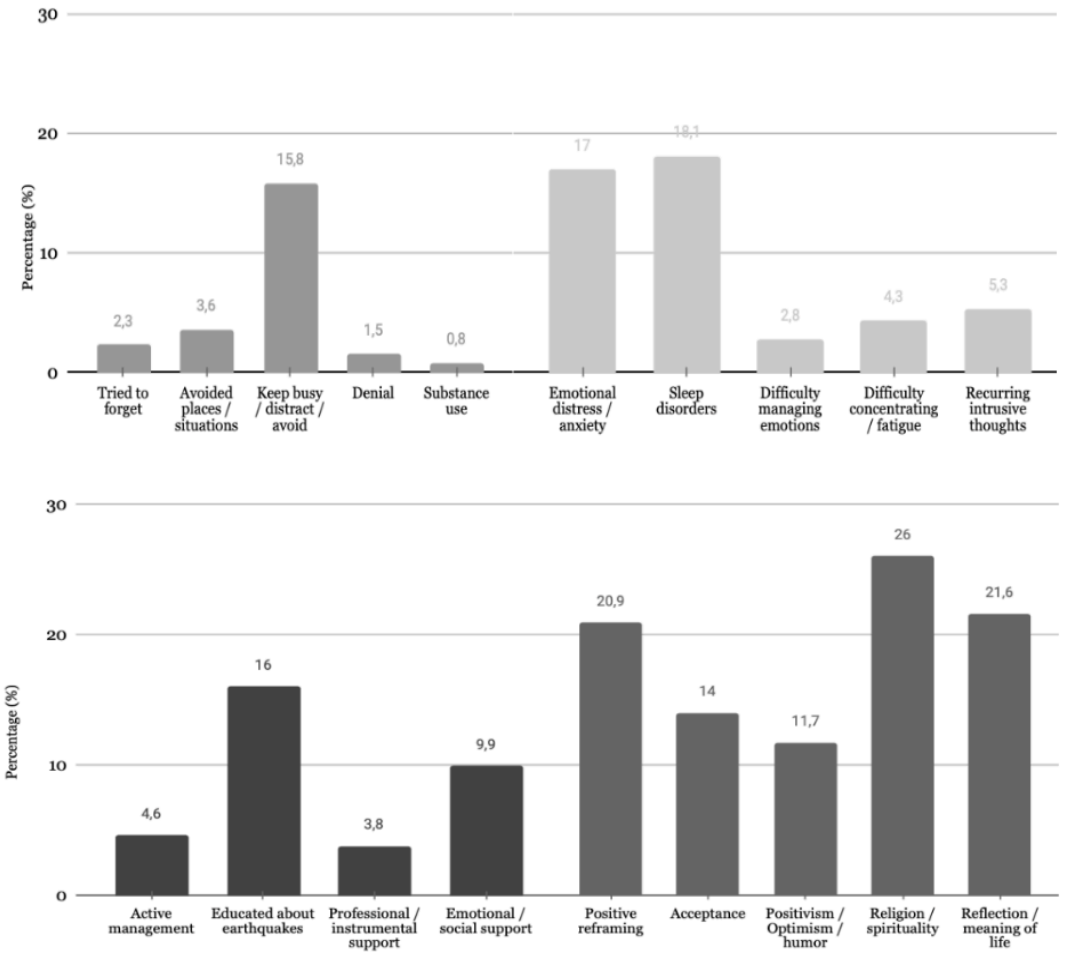
Problem-focused strategies were adopted by 29.2% of respondents. These included emotional or social support (9.9%), education about earthquakes (16.0%), active management (4.6%), and seeking professional or instrumental help (3.8%).

Approximately 30.7% of the sample reported stress-related symptoms, such as emotional distress (17.0%), sleep disturbances (18.1%), difficulties managing emotions (2.8%), cognitive fatigue (4.3%), or intrusive thoughts (5.3%).

Finally, avoidance and dysfunctional strategies were present in 22.8% of participants. These included attempts to forget the event (2.3%), distraction or excessive busyness (15.8%), denial (1.5%), avoidance of specific places (3.6%), and substance use (0.8%).

***Figure 3.*** *Long-Term Coping Strategies and Sub-Categories (N = 394)*






***Socio-demographic characteristics in Long-Term Strategies***

Emotion-focused strategies were more common among women (55.4%) than men (44.6%), but the difference was not significant. Similarly, problem-focused strategies were slightly more frequent in women (32.1%) compared to men (24.7%), $\chi^2(1) = 2.491$, $p = .115$. Younger participants (18–25) reported the highest use of dysfunctional coping (37.9%), a significant age effect ($\chi^2(3) = 11.328$, $p = .010$). Stress-related symptoms were also significantly associated with gender, age, and their interaction (all $p < .05$), with young women most affected.

**Table 6**

*Chi-Square Results: Coping Strategy Use by Gender and Age*

| Strategy | Gender (p) | Age Group (p) |
|---|---|---|
| Problem-focused | .115 | .324 |
| Emotion-focused | .169 | .142 |
| Avoidance/Dysfunctional | .236 | **.010** |
| Stress-Related | **<.001** | **.027** |

### *Geographical Exposure and Long-Term Strategies*

Participants living in urban areas were more likely to use emotion-focused strategies (71.0% vs. 44.5%, $\chi^2(1) = 16.949$, $p < .001$) and report stress-related symptoms ($\chi^2(1) = 8.428$, $p = .004$). Problem-focused and avoidance-based coping did not vary significantly by area type.

Greater distance from the epicenter was associated with more emotion-focused coping ($\chi^2(5) = 16.942$, $p = .005$), peaking among those over 100 km away. Avoidance and stress reactions were most common at intermediate distances (50–100 km), with significant chi-square results for both ($p < .05$). Problem-focused strategies showed no significant association with distance.

Importantly, the interaction between area type and distance revealed more complex patterns. Emotion-focused strategies were especially common among urban participants located far from the epicenter, particularly those over 250 km away ($\chi^2(6) = 21.336$, $p = .002$). Avoidance strategies peaked among rural participants situated at intermediate distances ($\chi^2(6) = 19.259$, $p = .004$). Stress-related symptoms were most frequent among individuals living in urban areas at moderate distances from the epicenter ($\chi^2(6) = 33.676$, $p < .001$). Problem-focused strategies remained unaffected by this interaction ($\chi^2(6) = 6.611$, $p = .358$).

**Table 7 :**

*Summary of Chi-Square Associations for level of exposure and Long-Term Strategies*

| Strategy Type | Area Type (p) | Distance (p) | Distance × Area (p) |
|---|---|---|---|
| **Problem-focused** | .314 | .316 | .358 |
| **Emotion-focused** | **< .001** | **.005** | **.002** |
| **Avoidance/Dysfunctional** | .248 | **.018** | **.004** |
| **Stress-related Reactions** | **.004** | **< .001** | **< .001** |

Note: p-values indicate the significance level of chi-square associations between coping strategies and geographical variables (type of area, distance to epicenter, and their interaction). Significant results are highlighted ($p < .05$).

***Type of damage***

The severity and type of damage significantly influenced long-term responses. Participants who experienced major damage, physical injury, or family loss were significantly more likely to report Emotion-focused coping: $\chi^2(6) = 24.354$, $p < .001$, Avoidance strategies: $\chi^2(6) = 21.755$, $p = .001$ or Stress-related symptoms: $\chi^2(6) = 31.119$, $p < .001$

Problem-focused coping did not differ significantly across damage types ($\chi^2(6) = 11.002$, $p = .088$), though a linear trend ($p = .011$) suggested more active coping among those with high material or emotional loss.

### 5.1.6. PTSD symptomatology and associated factors (PCL-5 Scale)

***Global PTSD Symptom Severity***

Posttraumatic stress symptoms were assessed using the PTSD Checklist for DSM-5 (PCL-5), a standardized 20-item self-report measure aligned with DSM-5 diagnostic criteria. Each item was rated on a 5-point Likert scale ranging from 0 (“Not at all”) to 4 (“Extremely”), with total scores ranging from 0 to 80. The scale evaluates the four PTSD symptom clusters defined by DSM-5: re-experiencing (B), avoidance (C), negative alterations in cognition and mood (D), and hyperarousal (E). In the current sample (N = 394), total PTSD scores ranged from 0 to 80, with a mean score of 25.50 (SD = 25.31). The score distribution was positively skewed, indicating that most participants reported

low to moderate symptoms, but a notable subset experienced high levels of psychological distress.

### *Prevalence of probable PTSD*

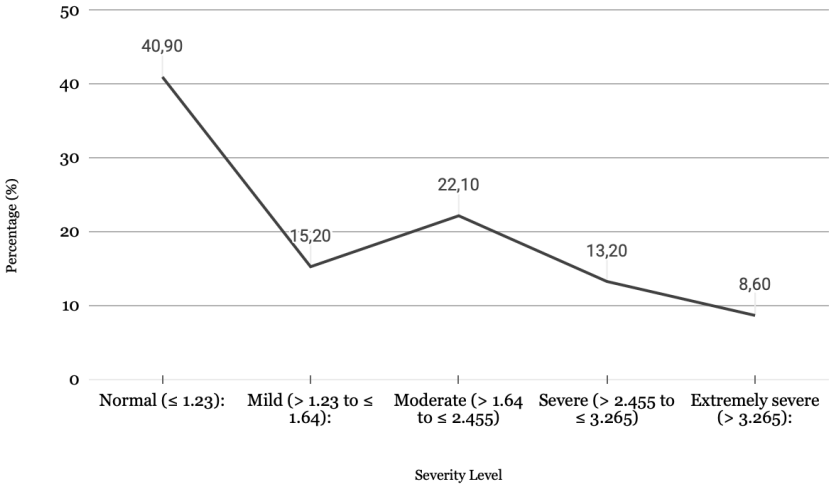
To estimate the prevalence of probable post-traumatic stress disorder (PTSD) within the sample, a clinical threshold of PCL-5 ≥ 33 was applied, as recommended by Bovin et al. (2016). Participants exceeding this threshold are considered to present symptoms of a clinically significant PTSD, likely to interfere with daily functioning. Based on this classification, **139 individuals (35.3%)** out of 394 participants were identified as **probable PTSD cases,** while **255 participants (64.7%) did not meet the clinical threshold.** This prevalence rate aligns with international findings from disaster contexts, where PTSD rates typically range from 20% to 40% among highly exposed populations (Neria et al., 2008; Galea et al., 2005).

### *Symptom Severity Classification (Average Item Score Method)*

To further examine the severity of posttraumatic stress symptoms, average item scores were computed for each participant and categorized according to clinically validated thresholds (see *Figure 4*). Results showed that 40,9 % of participants were classified within the *normal* range, 15,2 % as *mild*, 22,1 % as *moderate*, 13,2 % as *severe*, and 8,6 % as *extremely severe*. Overall, more than one-third of the sample (35,3 %) exhibited *moderate to extremely severe* symptomatology, indicating clinically significant distress and potential functional impairment.

***Figure 4.*** *Distribution of PTSD Symptom Severity Levels Among Participants (N = 394).*

*Note:* Severity levels are based on mean PCL-5 scores, categorized into five intervals: Normal, Mild,

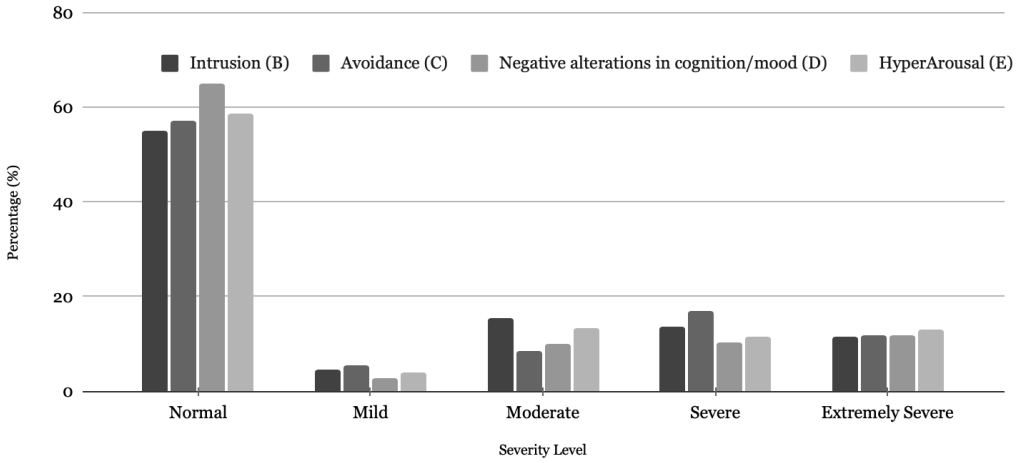



Moderate , Severe , and Extremely Severe. Percentages represent the proportion of participants within each severity range.

### *Symptom Clusters (B-E)*

All four DSM-5 symptom clusters were examined individually. Intrusion symptoms (B) and hyperarousal (E) showed the highest proportions of severe cases.

***Figure 5.*** *Severity Classification by PTSD Symptom Cluster (N = 394)*



### *PTSD among subgroups*

*Demographics characteristics*

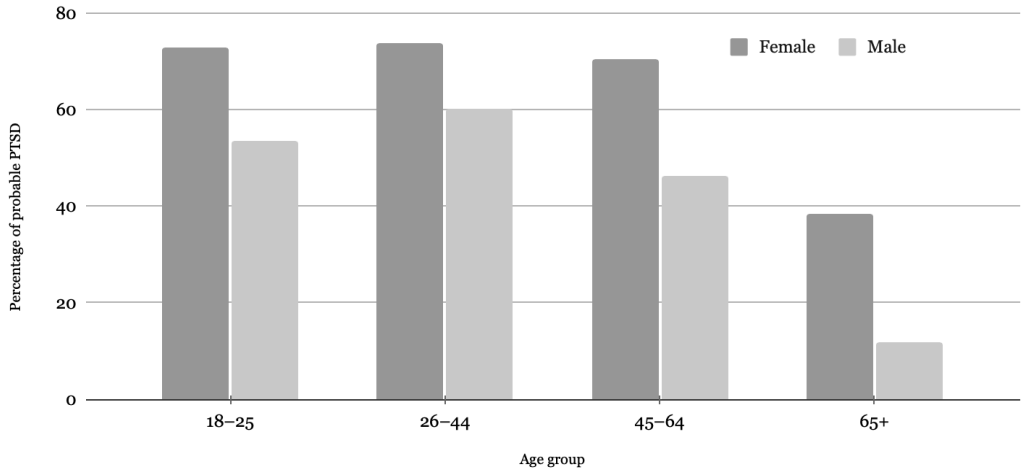
To examine gender differences in PTSD severity, two complementary statistical approaches were used. Independent-samples t-tests were conducted to assess gender differences in PTSD severity. No statistically significant difference was found in total PTSD scores between women ($M = 25.70$, $SD \approx 25.3$) and men ($M = 25.19$, $SD \approx 25.3$), $t(392) = 0.196$, $p = .845$.

However, when examining severity classification, a chi-square test revealed a significant gender difference ($\chi^2(4, N = 394) = 11.613$, $p = .020$). Women were more likely to fall into "mild" to "extremely severe" categories.

Additional t-tests were conducted on the severity scores of each PTSD symptom cluster (B: Intrusion, C: Avoidance, D: Negative alterations in cognition/mood, E: HyperArousal). None of the tests revealed significant gender differences. Although mean scores by symptom cluster showed minor but noteworthy patterns. Women scored higher than men in re-experiencing (Cluster B) and hyperarousal (Cluster E). Men had slightly higher scores in negative mood and cognition (Cluster D) and Avoidance symptoms (Cluster C) were nearly identical between genders.

Age groups differed significantly in PTSD prevalence ($\chi^2(3, N = 394) = 15.986$, $p = .001$) and severity ($\chi^2(12, N = 394) = 31.481$, $p = .002$), with younger participants (18–25) showing higher proportions of severe symptoms.

***Figure 6.*** *Probable PTSD Prevalence by Gender and Age Group (N = 394)*




**Note.** Percentages represent the proportion of participants meeting criteria for probable PTSD according to standard cut-off scores. $\chi^2(7, N = 394) = 20.43$, $p = .005$.

A chi-square test revealed a statistically significant association: $\chi^2(3, N = 394) = 12.93$, $p = .005$. The highest prevalence of probable PTSD was observed among widowed participants, of whom 68.4% met the clinical threshold. This was followed by divorced individuals (40.0%), and single participants (39.0%). Married individuals had the lowest prevalence, with 29.9%screening positive.

*Socio-Economic and Academic Status*

PTSD prevalence varied significantly across education levels ($\chi^2(4, N = 394) = 202.20$, $p < .001$). Individuals with no formal education (74.2%) or only primary education (100%) showed markedly higher rates of probable PTSD compared to university-educated participants (11.9%). Similarly, severe and extremely severe symptoms were disproportionately observed among the least educated. A t-test confirmed these differences: participants with no education ($M = 68.8$, $SD = 9.22$) scored significantly higher on PTSD than those with a university degree ($M = 41.2$, $SD = 21.5$), $t(282) = 9.67$, $p < .001$, $d = 0.34$.

**Table 8**

*Independent Samples t-Test: PTSD Score by Education (None vs. University)*

| Group | M | SD | t | df | p | 95% CI | d |
|---|---|---|---|---|---|---|---|
| None (n = 18) | 68.8 | 9.22 | | | | | |
| University (n = 234) | 41.2 | 21.5 | 9.67 | 282 | < .001 | [0.496, 0.750] | 0.34 |

Occupational status was also strongly associated with PTSD prevalence ($\chi^2(5) = 119.43$, $p < .001$). The highest rates were found among unemployed participants, students (38.1%), and low-skilled/manual workers (38.6%). In contrast, PTSD was rare among professionals (8.6%), the self-employed (4.5%), and retirees (2.5%). Severity levels followed a similar trend: extremely severe PTSD was most common among manual workers (44.4%) and unemployed individuals (26.7%), while normal symptom levels dominated among retirees and self-employed individuals.

*Exposure Variables*

A strong association was found between area type and probable PTSD diagnosis ($\chi^2(1) = 236.82$, $p < .001$), with 89.0% of probable PTSD cases living in rural areas versus 40.6% in urban zones. Severity levels also varied significantly: rural participants were overrepresented in the “Severe” (95.5%) and “Extremely Severe” (97.8%) categories. Independent-samples t-tests revealed significantly higher PTSD symptom severity among rural participants across all symptom clusters and the total score. Effect sizes were exceptionally large: intrusion ($d = 2.17$), avoidance ($d = 2.34$), negative mood/cognition ($d = 2.63$), hyperarousal ($d = 2.34$), and total PTSD score ($d = 2.37$).

Distance from the epicenter also influenced PTSD outcomes ($\chi^2(5) = 152.70$, $p < .001$). The highest prevalence was observed in the 50–100 km range (33.1%), followed by 10–50 km (21.6%). Surprisingly, the closest group (<10 km) had a lower PTSD rate

(5.8%), and no cases were found beyond 250 km. Severity levels mirrored this non-linear pattern: moderate to extremely severe symptoms peaked at intermediate distances.

**Table 9**

*Prevalence of Probable PTSD by Area Type*

| Area Type | n | % |
|---|---|---|
| Rural | 162 | 89.0 |
| Urban | 86 | 40.6 |

Note. $\chi^2(1, N = 394) = 236.82$, $p < .001$. Rural participants were more than twice as likely to present probable PTSD.

PTSD prevalence also varied based on individuals' location during the earthquake ($\chi^2(4) = 71.08$, $p < .001$). Highest rates were observed among those outside (67.6%) and inside on upper floors (46.5%). Those on ground floors or in vehicles reported lower rates.

Similarly, company during the event mattered ($\chi^2(3) = 126.79$, $p < .001$): individuals alone showed 100% PTSD prevalence, compared to 13–14% among those with family or friends.

A highly significant relationship between PTSD prevalence and who individuals were with during the earthquake was revealed ($\chi^2(3) = 126.79$, $p < .001$). Individuals who were alone had the highest rate of probable PTSD (100%), followed by those who were with others (not family or friends) (29.6%), while those with family or friends/neighbors had notably lower PTSD rates (13.2% and 14.0%, respectively). The distribution of PTSD severity levels differed significantly based on the company during the event ($\chi^2(12) = 136.79$, $p < .001$). Individuals who were alone were overwhelmingly classified in the severe (34.5%) and extremely severe (37.9%)categories. Conversely, those with family were overrepresented in the normal and mild severity categories (81.6% and 90.5%, respectively).

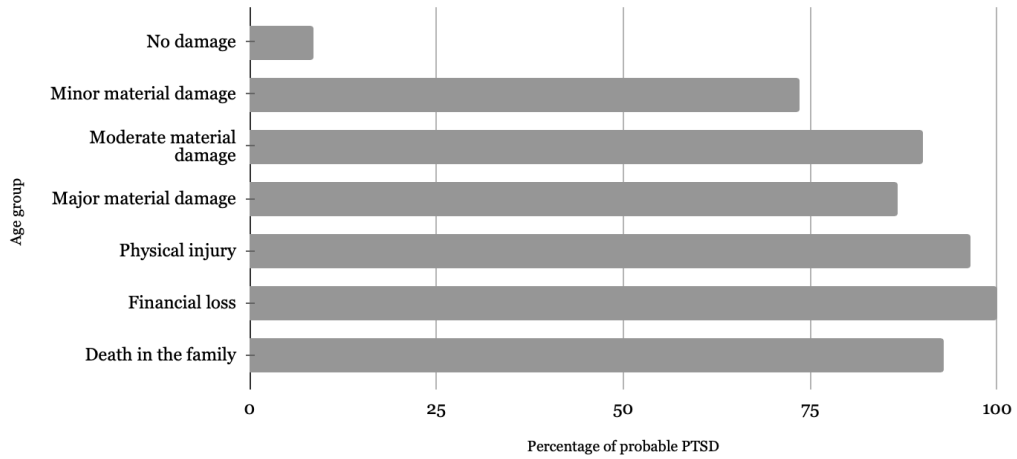
Another significant association was found between the type of damage experienced and the prevalence of probable PTSD, $\chi^2(6, N = 394) = 272.32$, $p < .001$. Participants who screened positive for probable PTSD were overwhelmingly concentrated in categories

involving *physical injury* (96,5 %), *financial loss* (100 %), *death in the family* (92,9 %), and *major material damage* (86,7 %).

A second chi-square analysis examined the distribution of PTSD **severity** as a function of damage type, again yielding a highly significant effect, $\chi^2(24, N = 394) = 323.14$, $p < .001$. A clear gradient emerged: individuals classified as *Normal*were mostly those who had experienced *no damage* (8,6 %) or *minor to moderate material damage* (73,5 % and 90,0 %, respectively). Conversely, the *Severe* and *Extremely Severe* categories were disproportionately composed of participants who had endured *physical injury* (31,8 % and 28,9 %), *family loss* (17,9 % and 22,2 %), or *major material damage* (34,1 % and 28,9 %).

Together, these patterns show a strong dose–response relationship: increasing exposure to material destruction, injury, or bereavement was associated with sharply elevated PTSD risk and severity. Notably, only 0,5 % of individuals in the "Extremely Severe" category had experienced no damage, underscoring the weight of traumatic exposure.

***Figure 7.*** *Prevalence of Probable PTSD by Type of Damage Experienced (N = 394)*




**Note.** Percentages represent the proportion of participants within each damage category who met the criteria for probable PTSD. $\chi^2(6, N = 394) = 272.32$, $p < .001$.

## *Psychological Immediate Reactions and Long-Term Coping Strategies*

*Immediate Reactions*

To explore the influence of immediate post-earthquake reactions on PTSD outcomes, a series of chi-square analyses were conducted examining the association between types of immediate responses and probable PTSD diagnosis (PCL-5 ≥ 33). The analysis revealed no significant association between immediate emotional or somatic reactions and PTSD probability, $\chi^2(1, N = 394) = 0.34$, $p = .560$. Similarly, spiritual or religious reactions did not significantly differentiate PTSD status, $\chi^2(1, N = 394) = 0.088$, $p = .766$.

In contrast, active behavioral reactions were strongly associated with PTSD status. Individuals who did not exhibit active behaviors ( helping others, seeking safety) were significantly more likely to develop PTSD than those who responded actively, $\chi^2(1, N = 394) = 22.66$, $p < .001$. Specifically, 51.1% of participants with probable PTSD did not engage in active behavioral responses, whereas 72.9% of non-PTSD individuals had shown active behavior during the event. A significant relationship was also found between dissociative/inhibited reactions and PTSD likelihood, $\chi^2(1, N = 394) = 7.15$, $p = .008$. Participants who experienced dissociative reactions (e.g., emotional numbness, freezing) were more likely to develop PTSD than those who did not, suggesting that inhibited coping during the traumatic experience may hinder emotional processing and increase vulnerability to psychological distress.

**Table 10**

*Prevalence of Probable PTSD by Immediate Reaction Type (N = 394)*

| Immediate Reaction Category | n | % | $\chi^2$(df) | p |
|---|---|---|---|---|
| Emotional/Somatic | 93 | 68.4% | 6.55(1) | **.010** |
| Behavioral/Active | 142 | 64.3% | 0.64(1) | .422 |
| Dissociative/Inhibited | 50 | 68.5% | 1.89(1) | .169 |
| Religious/Spiritual | 56 | 70.0% | 1.28(1) | .258 |

Note. Emotional reactions were significantly associated with PTSD diagnosis.

*Long term strategies*

A series of chi-square tests were conducted to examine the association between long-term coping strategies and the probability of presenting with probable PTSD (PCL-5 score ≥ 33). Only Emotion-focused strategies were significantly associated with PTSD status, $\chi^2(1, N = 394) = 19.04$, $p < .001$. Among participants with PTSD, 65.9% reported using emotion-focused strategies, whereas only 42.1% of those without PTSD used them. This suggests that reliance on emotion-focused strategies is more prevalent among those experiencing elevated PTSD symptoms.

In contrast, for problem-focused strategies, the association was not statistically significant, $\chi^2(1, N = 394) = 2.97$, $p = .085$. Although a slightly higher percentage of individuals without PTSD reported using such strategies (41.7%) compared to those with PTSD (26.3%), this difference did not reach statistical significance. No significant association was found between PTSD status and avoidance/dysfunctional strategies, $\chi^2(1, N = 394) = 1.14$, $p = .286$. Use of these strategies was reported by 21.2% of those with probable PTSD and 25.9% of those without PTSD, indicating relatively similar patterns across groups. Finally, stress-related reactions also did not show a significant association with PTSD status, $\chi^2(1, N = 394) = .15$, $p = .700$. These reactions were reported by 31.4% of participants with probable PTSD and 29.5% of those without.

**Table 11**

*Prevalence of Probable PTSD by Long-Term Strategy Category (N = 394)*

| Long-Term Strategy Category | n | % | $\chi^2$(df) | p |
|---|---|---|---|---|
| Problem-Focused | 80 | 60.2% | 1.87(1) | .171 |
| Emotion-Focused | 142 | 68.9% | 5.23(1) | .022 |
| Avoidance-Based | 74 | 75.5% | 7.63(1) | **.006** |
| Stress Symptom-Oriented | 92 | 79.3% | 13.71(1) | **<.001** |

**Note:** Avoidance and stress-related reactions were significantly associated with higher PTSD prevalence.

### 5.1.7. Multiple Linear Regression

#### *PTSD Severity*

To assess the independent contribution of key sociodemographic and exposure variables to PTSD severity, two multiple linear regression models were conducted.

The first model predicted the likelihood of meeting the criteria for probable PTSD (PCL-5 ≥ 33). The model was statistically significant, $F(8, 385) = 96.55$, $p < .001$, with an adjusted $R^2 = .660$. Significant predictors included academic level ($\beta = -.239$, $p < .001$), area type ($\beta = -.502$, $p < .001$), distance from the epicenter ($\beta = -.097$, $p = .011$), and type of damage ($\beta = .104$, $p = .003$). These findings indicate that living in rural areas, being less educated, experiencing greater damage, and being located closer to the epicenter significantly increased PTSD risk.

A second regression examined PTSD symptom severity (total score) and yielded similar results ($F(8, 385) = 93.17$, $p < .001$, adjusted $R^2 = .652$). Again, academic level, area type, type of damage, and occupation were significant predictors. These results reinforce the role of socioeconomic vulnerability and exposure severity in shaping PTSD outcomes.

**Table 12**
*Multiple Regression Predicting PTSD Total Severity (N = 394)*

| Predictor | B | SE | β | t | p |
|---|---|---|---|---|---|
| **Gender (Female = 1)** | –0.090 | 0.093 | –0.030 | –0.97 | .335 |
| **Age (continuous)** | –0.012 | 0.006 | –0.115 | –2.09 | **.038** |
| **Academic Level** | –0.149 | 0.041 | –0.239 | –3.60 | **< .001** |
| **Occupation** | –0.086 | 0.034 | –0.095 | –2.58 | **.010** |
| **Area Type (Rural = 1)** | –1.886 | 0.118 | –0.616 | –15.98 | **< .001** |
| **Distance from Epicenter** | –0.040 | 0.060 | –0.097 | –2.57 | **.011** |
| **Type of Damage** | –0.086 | 0.029 | –0.104 | –2.98 | **.003** |

| | | | | | |
|---|---|---|---|---|---|
| **Family Situation** | –0.048 | 0.041 | –0.041 | –1.16 | .247 |

### *Symptom Clusters*

Regression models conducted for each PTSD symptom cluster revealed consistent and robust patterns.

For Cluster B (Intrusion), the model was significant ($F(8, 385) = 70.36$, $p < .001$, adj. $R^2 = .585$), with gender, academic level, area type, distance from the epicenter, type of damage, and occupation all emerging as significant predictors.

Cluster C (Avoidance)showed a similarly strong model ($F(8, 385) = 73.93$, $p < .001$, adj. $R^2 = .597$), with family situation, academic level, area type, and damage as key predictors. For

Cluster D (Negative mood and cognitions), the strongest model was observed ($F(8, 385) = 100.80$, $p < .001$, adj. $R^2 = .670$), with academic level and area type as the most powerful predictors, alongside significant effects of damage and occupation.

Finally, the model for Cluster E (Hyperarousal) was also significant ($F(8, 385) = 78.84$, $p < .001$, adj. $R^2 = .613$), with academic level, area type, and damage as significant predictors, and marginal contributions from distance and occupation. These findings indicate that socioeconomic status and exposure severity not only influence overall PTSD outcomes but also shape specific symptom patterns.

### *Perceived impact management (likert scale)*

Participants rated how well the earthquake's impact was managed on a scale from 1 ("very poorly") to 10 ("very well"). The mean score was 6.15 (SD = 2.55), with a median of 6, suggesting a moderately positive evaluation. Over two-thirds of participants (66.2%) gave a score of 6 or higher, and 16.5% rated it the maximum of 10, indicating that while perceptions varied, the majority felt the response was adequate or better.

To explore predictors of perceived management, a multiple linear regression was conducted including gender, age group, academic level, occupation, and probable PTSD diagnosis as predictors. The overall model was statistically significant, $F(5, 388) = 8.22$, $p < .001$, with an adjusted $R^2 = .084$, indicating that approximately 8.4% of the variance in perceived impact management could be explained by the model.

Among the predictors, two were significant, Gender and PTSD prevalence. Women were slightly more likely to report lower satisfaction ($B = –0.536$, $p = .035$) and Individuals who met the criteria for probable PTSD gave significantly lower ratings of impact management ($B = –1.440$, $p < .001$).

### 5.1.8. Summary for Quantitative Analysis

The quantitative analyses revealed a high prevalence of post-traumatic stress symptoms among individuals affected by the Al Haouz earthquake, with over one-third meeting the clinical threshold for probable PTSD. Symptom severity varied significantly across sociodemographic and contextual factors. Bivariate and multivariate analyses consistently identified lower academic attainment, rural residence, proximity to the epicenter, and exposure to severe damage as strong and independent predictors of both PTSD diagnosis and symptom intensity. Occupational instability and family situations also emerged as relevant for certain symptom dimensions. Cluster-specific regressions confirmed that these structural and exposure-related factors shaped the expression of PTSD across all four domains (intrusion, avoidance, negative mood, and hyperarousal). The cumulative results underline the central role of social vulnerability and geographic inequality in post-disaster mental health outcomes, emphasizing the need for targeted psychosocial interventions in the most exposed and under-resourced communities.

## 5.2. Qualitative Results

In alignment with the explanatory sequential design of this study, the qualitative analysis was conducted to complement and deepen the understanding of the quantitative results. While statistical analyses identified trends in PTSD prevalence and severity across subgroups, the qualitative component provided rich contextual insight into how individuals interpreted, experienced, and responded to the Al Haouz earthquake on a psychological, social, and emotional level.

Qualitative data were drawn from two complementary sources. Free-text responses from three open-ended questions in the online questionnaire, covering immediate reactions during the earthquake (Q3.1), strategies adopted in the weeks that followed (Q3.2), and final reflections or current emotional state (Q5.3). And completed by twenty semi-structured interviews with selected participants who were either recontacted following survey consent or met during field visits in rural, high-exposure zones. This sub-sample included earthquake survivors, NGO volunteers, and mental health professionals operating in the affected areas.

Thematic analysis was conducted manually using Microsoft Excel. It was following a process including familiarisation, initial inductive coding, and clustering of meaning units that led to the emergence of five major themes, described below.

***Disorientation and Protective Reflexes***

Many participants described the first moments of the earthquake as marked by a deep sense of disorientation, fear, and automatism. The disruption of ordinary perception often led to contrasting reactions, from dissociative freezing to instinctive efforts to protect oneself or others. These divergent responses reveal the raw immediacy of trauma and the diversity of coping processes during extreme stress. Some individuals recounted experiencing a paralysing sense of shock:

> *"I froze. I couldn't move, I didn't know what was happening."*
>
> *"I thought I was fainting. My legs were shaking and I couldn't get out."*
>
> *"I felt like my head was spinning and I didn't know how to react."*

Others, in contrast, described engaging in protective, often automatic behaviours:

> *"I rushed to grab my kids and we ran out barefoot."*
>
> *"Without thinking, I locked the door, took the emergency bag, and went outside."*
>
> *"I helped my elderly mother walk down the stairs while still in shock."*

These experiences reflect a continuum between dissociation and hyperactivation. While dissociative reactions are often unconscious responses to overwhelm, protective actions may represent mobilized fear or practiced emergency instincts. Both can coexist within the same individual, depending on the context and perceived control.

Interestingly, several participants mentioned a lack of awareness in the moment, revealing how trauma disrupts the brain's capacity to make sense of danger

> *"At first, I thought it was a truck. Then I realised the whole house was shaking."*
>
> *"I was outside and didn't understand what was going on until people started screaming."*

This theme highlights the diverse reactions that emerged under extreme stress. While some sought immediate protection, others felt overwhelmed by helplessness or unreality. These patterns echo the quantitative findings linking dissociative reactions with PTSD risk, and active behaviours with protective outcomes. In both cases, participants' testimonies offer a vivid picture of how trauma unfolds in real time, shaped by bodily responses, relational context, and meaning-making processes.

***Persistent Somatic and Hyperarousal Symptoms***

A recurring theme was the persistence of somatic symptoms and heightened sensitivity to environmental stimuli long after the earthquake. Participants reported startle responses, difficulty sleeping, nightmares, and physical symptoms such as dizziness, digestive issues, or trembling, often interpreted retrospectively as trauma-related.

Several individuals described sleep disturbances and restlessness, suggesting a nervous system that had not returned to baseline. Some emphasized the physical exhaustion and tension that followed even minor stimuli

> *"I can't sleep anymore unless I'm with people. I'm scared the house will collapse again."*
>
> *"I still wake up at night panicking when I hear a loud sound."*
>
> *"Since the earthquake, I feel permanently on edge. Any movement or sound makes me jump."*

Beyond hyperarousal, some testimonies revealed a shift in daily rhythms and sensory awareness, with heightened attention to vibrations, cracks in walls, or noises from outside. This theme connects directly to the quantitative data, where long-term stress-related symptoms (sleep disorders, fatigue, intrusive thoughts) were frequent, particularly among participants with high PTSD scores.

***Spiritual Meaning-Making and Existential Reawakening***

Spiritual and religious interpretations emerged as central long term coping mechanisms.. For many participants, the earthquake triggered not only emotional distress but also a deep spiritual and existential reflection. This theme encompasses the ways in which individuals interpret the event through the lens of religious belief, divine will, or existential awareness, often as a way to cope with loss, helplessness, and uncertainty. Many perceived the event as a divine reminder, a test of faith, or a prompt to reorient life priorities. Others used faith to manage anticipatory anxiety and fear of recurrence. Prayers, fatalistic acceptance, and renewed religious commitment were often reported.

This spiritual framing often helped participants make sense of the incomprehensible, and to reclaim a sense of meaning or agency in the face of chaos. Some associated the event with the transience of life, inspiring both humility and gratitude:

> *“God reminded us that life is short, and that He can take it back at any time.”*
>
> *“It was a lesson from Allah. We had forgotten Him.”*
>
> *“I started praying regularly again after the earthquake. I realized how fragile we are.”*
>
> *“Since that night, I’ve never missed a prayer.”*
>
> *“I used to be distant from religion. But now, I find peace in remembering God.”*
>
> *“We were running after money, after material things. Now we know none of that matters.”*
>
> *“We realized what’s essential: our family, our faith, our survival.”*

These narratives reflect culturally rooted coping strategies, where religion and spirituality serve not only as belief systems, but as tools for emotional regulation and resilience.

***Solidarity and Institutional Trust***

Narratives often contrasted collective solidarity, both national and local, with perceived institutional abandonment. Many participants actively engaged in relief work, supported others, or were themselves supported. Many participants reported experiencing a profound shift in values and life priorities, often accompanied by a renewed sense of solidarity and human connection. Yet frustrations also emerged regarding aid distribution, delays, and governmental disorganisation. Responses to survey question 5.3 revealed broader social and political reflections regarding post-disaster governance and trust.Several participants expressed disillusionment with institutional responses.

Numerous testimonies emphasized how solidarity emerged spontaneously, often among strangers. This renewed social cohesion contrasted with pre-existing tensions or divisions in the society. For many, the disaster acted as a reminder of shared humanity.

> *"It's not just about rebuilding houses. People are broken on the inside."*
>
> *"We survived physically, but not all of us are okay in our heads."*
>
> *"We realized we all depend on each other. We are fragile alone."*
>
> *"The earthquake brought people together more than anything else could."*
>
> *"I started volunteering and giving more to others."*

### *Mental Health Awareness and Emotional Expression*

Although mental health remains a stigmatized topic in many communities, the earthquake experience appeared to generate a greater awareness of psychological vulnerability and the importance of emotional expression. This theme captures a shift in participants' attitudes toward talking about emotions, seeking support, and recognizing mental distress as legitimate. Several participants expressed an emerging recognition of the psychological consequences of the event. Individuals previously stigmatised for using medication or seeing therapists reported feeling more supported and legitimised in their care-seeking behaviour. Some testimonies reflected a new openness to seeking help or talking about emotions, despite traditional cultural barriers.

> *"It's not just about rebuilding houses. People are broken on the inside."*
>
> *"We survived physically, but not all of us are okay in our heads."*
>
> *"Before, I thought seeing a psychologist was shameful. Now I understand why some people need it."*
>
> *"I never talked about fear before, especially as a man. But after this, I had to say something."*

Others emphasized the role of collective emotion sharing among neighbors, families, or online groups as a form of self-regulation.

> *"What helped was talking with other people who were there. We cried, we laughed, we remembered together."*
>
> *"The night of the quake, I couldn't stop crying. And I didn't feel ashamed."*

While formal psychological services were rarely mentioned directly, the earthquake seems to have triggered a heightened sensitivity to mental well-being, breaking through layers of silence and stigma.

***Existential Reassessment and Reprioritisation***

Many participants described the earthquake as a life-altering experience that led to a deep reassessment of their personal values and priorities. Reflections often centered on the fragility of life, the ephemeral nature of material possessions, and a renewed focus on what truly matters such as health, family, faith, and human connection. For some, this existential shift was accompanied by spiritual insight or a desire to engage more meaningfully with others and the world. Some described a need to live more consciously and purposefully, often in connection with spiritual or moral reflection. This theme demonstrates how disaster experiences, while deeply disruptive, can also trigger transformative questioning and a reorientation of life goals.

> *"I used to only think about work and money. Now, all I want is peace and safety."*
>
> *"We were chasing things that didn't matter. This taught me that family and health come first."*
>
> *"After the earthquake, I stopped buying unnecessary things.*

***Summary of Qualitative Data***

The qualitative findings provide a rich and nuanced understanding of the psychological, emotional, and existential impact of the Al Haouz earthquake nuancing common key themes. These themes reveal the human dimensions of trauma, how individuals respond in the moment, how they carry the experience in their bodies and minds, and how they restructured their lives and values in its aftermath. The testimonies

highlight both vulnerability and resilience. They show how trauma is lived not only as psychological suffering but also as a deeply social and cultural experience, shaped by spirituality, relationships, memory, and identity. While many participants reported persistent distress, they also described transformations in priorities, greater emotional openness, and renewed faith or solidarity.

These findings align with the study's aims to understand how sociocultural and environmental factors shape psychological recovery.

# 6. DISCUSSION

The present study aimed to investigate the psychological consequences of the 2023 Al Haouz earthquake, with a particular focus on post-traumatic stress symptoms, coping strategies, and vulnerability factors. Using a mixed-methods design, it sought to bridge empirical prevalence data with survivors' lived experiences.

## 6.1. Overview of PTSD Outcomes and Patterns

### 6.1.1. PTSD Prevalence

The findings of this study confirm that the psychological impact of the Al Haouz earthquake was both significant and unevenly distributed across the population. Based on the PCL-5 cutoff score (≥33), 35.3% of participants met the criteria for probable PTSD, indicating a substantial burden of trauma. This finding is consistent with previous epidemiological reviews, which estimate PTSD prevalence following natural disasters to range between 20% and 40%, depending on the intensity of exposure and sociocultural context (Neria et al., 2008; Tang et al., 2017).

In terms of symptom patterns, intrusion/re-experiencing (Criterion B) and hyperarousal (Criterion E) were the most elevated clusters in this study. Nearly one-quarter of participants reported severe or extreme intrusive memories and nightmares, and a similarly high proportion reported severe hyperarousal symptoms like sleep disturbance, jumpiness, and irritability . Many survivors described persistent startle responses, insomnia, and feelings of being "permanently on edge," often triggered by loud sounds or minor tremors ("I still wake up at night panicking when I hear a loud sound"). Such hypervigilance is common after earthquakes, as aftershocks and environmental cues can perpetuate a state of alarm (Cénat et al., 2020). Intrusive recollections were likewise prominent; participants vividly recalled the moment of the quake in flashbacks and nightmares, reflecting how unprocessed traumatic memories continue to intrude upon daily life.By contrast, avoidance symptoms (Criterion C) and negative alterations in cognition (Criterion D) and mood were less frequent.

This may indicate a double-edged coping process: while some attempted to suppress thoughts or stay away from reminders, others were constantly confronted with environmental cues of the disaster (destroyed homes, still living in tents), which may

have forced engagement with trauma memories. It is possible that culturally normative meaning-making (discussed below) and strong community support tempered feelings of helplessness in many survivors despite the trauma. Indeed, several participants emphasized gratitude for survival and a reframing of priorities ("We realized what's essential: our family, our faith, our survival").

### 6.1.2. Social, Economic, and Structural Predictors of Risk

Certain socio demographic groups exhibited distinctly higher PTSD rates, highlighting important risk factors for post-earthquake psychopathology.

#### *Gender*

Female participants, overall, had a higher likelihood of severe PTSD symptoms. While the mean PTSD scores did not differ significantly between women and men , women were over-represented in the "extremely severe" PTSD category (62%) with higher intrusion and hyperarousal symptoms. These findings can align with disaster studies indicating females are more vulnerable to PTSD Prevalence after trauma being roughly 1.5–2 times that of men (Tang et al., 2017; Baral & K.C., 2019). However, a notable proportion of Male fell into the "severe" category. Indeed, they described struggling with emotional expression due to gender norms ("I never talked about fear before, especially as a man"). In the conservative rural Moroccan context, both may also face cultural norms that discourage open expression of fear, potentially leading to internalized distress.

Middle-aged adults showed the highest PTSD impact in this sample, whereas older adults (65+ years) had strikingly low rates. Participants aged 45–64 comprised the largest share of PTSD cases, and women in this age group in particular showed the highest prevalence of probable PTSD (26.6% of that subgroup). Young adults (18–25) also had many severe cases (in that subgroup, 20% were "extremely severe"). In contrast, among seniors 65+, virtually none met the PTSD cutoff (only 0.5% of the total sample were older adults with PTSD). This age pattern diverges somewhat from findings in other contexts. Some studies report higher PTSD in elderly survivors due to

frailty and loss of coping capacity (63% of older adults had PTSD after Nepal's quake) (SOURCE) , whereas others find youth more affected. These results suggest that in this Moroccan sample, older age was a protective factor for PTSD. It is possible that older survivors drew on greater emotional resilience, faith, or acceptance of fate. Additionally, response biases might have played a role as that subgroup was underrepresented (only 7.9% of the sample was 65+) due to accessibility to the online survey.

Middle-aged adults faced multiple stressors such as caring for children and elderly relatives, economic losses, and the burden of rebuilding homes and livelihoods. They had much to lose in the disaster (property, income, community roles) and immense responsibility in the aftermath, which can manifest as psychological strain. Younger adults (18–25) also showed high symptom severity, possibly reflecting disruption at a formative life stage and fewer coping experiences.

It is also notable that marital status intersects with age and gender at risk. Among widowed individuals, many of whom are older women, had the highest PTSD prevalence of any group (68% met PTSD criteria). This suggests social isolation or loss of a spouse amplified trauma reactions, whereas being married was somewhat protective as the presence of a support.

### *SocioEconomic Level*

One of the most robust predictors of PTSD in our study was educational attainment. PTSD prevalence was inversely related to educational attainment, with the highest rates observed among individuals with primary-level or no formal education. People with no schooling had six times the odds of PTSD compared to those with higher education. Education may confer resilience by improving one's ability to understand and psychologically process the event, access information and resources, and navigate recovery services. Those with little or no education, who in Morocco are often from poorer, rural backgrounds, may have felt overwhelmed and helpless, with limited access to psychosocial support.

Occupational status further illustrated how the economic disadvantage was strongly linked to worse psychological outcomes. Being unemployed or in manual labor

likely correlates with lower income and fewer resources to cope with disaster losses, as well as potentially higher exposure. Notably, retired participants had the lowest PTSD prevalence (consistent with the age effect discussed above), and many retirees fell into the "normal" symptom range. This aligns with evidence that disaster survivors with pre-existing economic vulnerabilities are at heightened risk for mental health problems. Qualitative data highlighted how financial strain and job loss post-quake caused significant anxiety about the future, especially for those who lost their primary income source. Some participants expressed feeling "trapped" by circumstances, having "no way to rebuild without help," which can exacerbate feelings of hopelessness.

A critical finding is the vast urban–rural disparity in trauma impact. Rural residents were far more affected psychologically than urban residents. Among participants who developed PTSD, fully 87.8% lived in rural areas. These statistics reflect the geography of the Al Haouz quake: mountain villages near the epicenter were devastated, whereas urban centers like Marrakech (relatively further away) experienced shaking but less destruction.

Interestingly, analysis of distance from the epicenter revealed a non-linear relationship with PTSD prevalence. Those residing 50–100 kilometers from the epicenter reported higher PTSD prevalence than those closer, suggesting a potential "middle-zone effect" as described by Galea et al. (2005), where high-exposure individuals beyond the initial focus of attention receive insufficient support, intensifying psychological distress. This counterintuitive also may be due to sampling and aid distribution quirks: in the immediate epicentral zone, destruction was extreme but perhaps survivors were either quickly evacuated or received concentrated relief. Additionally, those who were caught on upper floors or out in the outside likely felt extremely vulnerable and witnessed more chaos due to perceived tremors.

## 6.2. Coping Strategies and Resilience Pathways

Coping strategies were assessed in two ways. Quantitatively, by categorizing participants' reported immediate and long-term strategies, and qualitatively, through narratives of how individuals managed their stress in the weeks and months following the quake. This reflected a broad spectrum of psychological responses.

Many survivors engaged in active, problem-focused coping, which involves taking concrete steps to address challenges posed by the disaster. Quantitatively, a large proportion of participants endorsed problem-solving behaviors such as repairing homes, organizing aid, or providing support or securing food or shelter. Although data did not show a statistically significant association between problem-focused coping and lower PTSD, such strategies were especially common among middle-aged men and highly educated individuals. In interviews, survivors frequently cited "keeping busy" with recovery tasks as a way to distract from fear and sadness. However, it is important to note, however, that over-engagement in work can sometimes be a form of avoidance ("staying busy to forget")

Quantitative analysis found that emotion-focused coping such as including venting and seeking emotional support, was the only category significantly associated with PTSD status. Survivors with elevated PTSD symptoms often reported frequent crying spells, persistent anxiety, or needing to talk repeatedly about their fears. It appears that in the sample, those who coped solely through emotional expression without also engaging in problem-solving or meaning-making tended to fare worse. In contrast, those who combined emotional support with active steps or reframing seemed to adjust better. Thus, emotion-focused coping can be a double-edged sword. It is crucial to distinguish between adaptive emotion-focused strategies (discussing feelings with a trusted friend, which can reduce stigma and isolation) and maladaptive ones (ruminating endlessly or expressing emotion in ways that reinforce helplessness).

Avoidant and dysfunctional coping strategies, such as emotional withdrawal or behavioral disengagement, were less frequently reported but associated with higher PTSD severity. Previous studies suggest that avoidance impairs trauma processing and sustains long-term psychological symptoms (Littleton et al., 2011). This kind of

emotional suppression can delay healing and often correlates with greater symptom severity. Dysfunctional coping was likely under-reported (due to stigma or lack of direct survey items), but the qualitative evidence and external research suggest it played a role in sustaining distress for some individuals. A few accounts hinted at increased substance use like smoking “to calm nerves”.

A dominant theme in the qualitative data was the reliance on religious and spiritual coping strategies. Many participants interpreted the earthquake through a religious lens , as a lesson from God and coped by strengthening their faith. This included practices like praying more frequently, attending religious gatherings, reciting Quranic verses for protection, and attributing the disaster to God’s will or a divine test. Some found solace in the belief that “It was a lesson from Allah. We had forgotten Him,” seeing the event as a reminder to lead a more pious life. A number of participants described renewed religious commitment after the quake: “Since that night, I’ve never missed a prayer,” and “I started praying regularly again after the earthquake. I realized how fragile we are”. These quotes illustrate positive religious coping, where faith provides meaning, comfort, and a framework to re-evaluate one’s life. Few participants expressed negative religious coping (divine punishment or anger), suggesting that spiritual beliefs functioned as a source of psychological coherence rather than guilt. Religious coping in this context appeared largely adaptive, it offered emotional solace, a supportive community and cognitive structure to an otherwise chaotic experience. Research in similar cultural settings like the post-earthquake in Turkiye indicates that positive religious coping is associated with lower anxiety and depression and can foster posttraumatic growth (Okan et al., 2025). It as a central pillar of resilience in this community, consistent with extensive evidence that in predominantly religious societies, survivors draw on faith to cope with trauma

### 6.3. Cultural Context and the Role of Meaning-Making

One of the most compelling findings of this study is how survivors made sense of the disaster and derived meaning from it within their cultural context. The qualitative data revealed rich themes of religious interpretation, existential reflection, collective

solidarity, and critiques of institutional response. These cultural meaning-making processes are crucial to discuss, as they represent the broader psychosocial impact of the earthquake; beyond individual symptoms, we see changes in worldviews, values, and community dynamics.

In Moroccan society, which is predominantly Muslim, it was unsurprising that many survivors framed the earthquake in religious terms. However, the ways they did so provide important insight. A common narrative was that the quake was "God's will" or a divine test. As noted earlier, numerous participants described the event as a wake-up call from God. Such beliefs provided a moral narrative for interpreting the trauma and were often related to comfort and guidance. Participants who endorsed the view of the quake as a test of faith or divine lesson tended to also express acceptance and hope. They saw their survival as purposeful (perhaps to renew devotion or do good), which aligns with the concept of benevolent reappraisal in religious coping (Aydın et al. 2025). This reframing can be protective because it imbues a senseless tragedy with meaning. Instead of feeling randomly victimized by nature, individuals feel part of a larger spiritual narrative, which can restore a sense of order. Moreover, by attributing control to a higher power, survivors might reduce self-blame or rumination. ("these things are in God's hands"). Many coupled their faith with action, embodying the proverb "Trust in God but tie your camel." For instance, after thanking God for their survival, they immediately engaged in helping others. It's a double reassurance: one, that a supreme being had a plan (so the chaos has cosmic meaning), and two, that by renewing faith one can gain psychological success and possibly divine favor to prevent future harm.

Participants also engaged in existential reassessment. The earthquake prompted reflection on life priorities, materialism, and mortality. Participants of all backgrounds reported that the earthquake fundamentally changed their outlook. Many realized the "ephemeral nature of material possessions" and shifted focus to what truly matters such as "health, family, faith, and human connection". One individual noted, "We were running after money, after material things. Now we know none of that matters," while another said, "I used to only think about work and money. Now, all I want is peace and safety" . These statements demonstrate profound value changes, from career or wealth

orientation to a focus on basic well-being and relationships. Such existential shifts are often reported after life-threatening experiences, as people confront mortality and realize what they were taking for granted. This can be seen as meaning-making where survivors are creating a narrative that emphasizes personal growth and learning from the tragedy (Park, 2010). It's notable that many in the sample did not frame their experience solely in terms of loss, but also in terms of gain in insight. The literature suggests that facilitating meaning-making can aid recovery (Williams et al., 2018). This is a potentially protective process, as it can give survivors a sense of posttrauma purpose.

Despite its devastation, the earthquake catalyzed a powerful wave of social solidarity. Participants frequently remarked that the disaster "brought people together more than anything else could.". "We realized we all depend on each other. We are fragile alone,". Many participants reported that they themselves engaged in relief efforts. "I started volunteering and giving more to others" was a typical sentiment, which gave them a sense of purpose and connection. The solidarity extended beyond local communities to the national level, numerous Moroccans from other cities sent aid or came to volunteer in Al Haouz, an outpouring that survivors deeply appreciated.

### 6.4. Social Dynamics and Emerging Opportunities for Psychosocial Change

Prosocial behavior can be a protective factor. However, findings also echo the nuanced trajectory described by Kaniasty (2020). After the initial phase of solidarity, frustrations and social tensions can emerge. A few participants noted that after the first few weeks, characterized by spontaneous assistance from fellow citizens, NGOs, and local volunteers, the visibility and effectiveness of institutional support decreased significantly. Unfulfilled promises, such as incomplete housing repairs or delayed or incomplete financial assistance, were commonly reported, alongside allegations of corruption and favoritism in the distribution of aid. These dynamics created a growing sense of injustice and disillusionment, eroding trust not only in public institutions but also within the community itself. As some individuals were seen to receive more or faster than others. These perceptions generated interpersonal and intergroup tensions within communities, as some individuals or families felt marginalized. Such contextual

dynamics should be taken into account, as they appear to sustain psychological distress in the affected regions, particularly among vulnerable populations in rural areas near the epicenter. These conditions may prolong emotional suffering by reinforcing feelings of anger, injustice, and powerlessness, thereby contributing to the persistence of PTSD or depressive symptoms over time.

### *Mental health awareness and stigma*

An encouraging emergent theme was the increased openness about mental health following the earthquake. Morocco, like many other countries, still sometimes has stigma around psychological issues, and traditionally people (especially men) may avoid discussing emotions or seeking mental health care. However, participants noted a cultural shift in the quake's wake. An interviewed psychologist admitted that "the earthquake experience appeared to generate a greater awareness of psychological vulnerability and the importance of emotional expression among all types of population." Even those who once dismissed mental health needs began acknowledging them. This indicates a reduction in stigma and recognizing that psychological injuries are real and valid. Additionally, communal sharing of emotions (neighbors talking openly about fear, grief, even crying together) became more normalized "I never talked about fear before… But after this, I had to say something,".

Such openness can be viewed as a positive cultural change spurred by the disaster. It suggests that extreme events can sometimes act as catalysts for improving mental health literacy and empathy in a community (Shultz et al., 2016). And a normalization of distress is a critical step in community healing, because it encourages individuals to seek help and support each other rather than suffer in silence. However, Very few participants reported having accessed psychological services unless they were provided through NGOs intervention for example. This suggests that while awareness increased, turning that into help-seeking remains another leap that might require availability of services and continued anti-stigma efforts. That persistent gap between awareness and utilization suggests that normalization alone is insufficient. Practically, interventions must be culturally adapted and improve accessibility and affordability among communities.

## 6.5. Methodological Reflections and Study Limitations

This study adopted a mixed-methods design, integrating standardized quantitative surveys with qualitative interviews and open-ended responses. This approach allowed for both statistical generalizability and a deeper contextual understanding of the psychological impact of the Al Haouz earthquake. One of the main strengths of the study was the use of the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5), a validated tool that aligns with international diagnostic criteria and enhances the clinical relevance and comparability of findings. The final sample size (N = 394) was relatively robust and included participants from diverse age groups, educational and socio-economic backgrounds, and both rural and urban settings. Additionally, the inclusion of field-based interviews in high-exposure areas helped capture underrepresented voices and provided culturally grounded insights.

Despite these strengths, several methodological limitations must be acknowledged. The sampling strategy, initially based on online recruitment, may have introduced selection bias by favoring participants with internet access. Although field outreach partially addressed this, the most marginalized populations remained underrepresented.

Second, the cross-sectional nature of the study limits causal inference and prevents an understanding of symptom progression over time. Future research should consider longitudinal designs to monitor psychological trajectories in post-disaster contexts.

Moreover, the reliance on self-reported measures may have introduced response biases, such as underreporting due to social desirability or cultural stigma, particularly regarding emotional distress or mental health symptoms. Although this is a common limitation in psychosocial research, it remains important to acknowledge its potential impact on prevalence estimates and coping patterns.

Finally, coping strategies were classified based on thematic analysis of open responses rather than through a standardized coping inventory. While this decision was made to reduce participant burden and increase cultural appropriateness, it limits comparability with other studies and may have reduced the reliability of coping profiles. Future research might consider integrating shorter, culturally validated instruments to assess coping more systematically without overburdening respondents.

## 6.6. Practical Implications and Policy Recommendations

The findings of this study point to urgent priorities for mental health intervention in post-disaster settings, especially in rural and low-resource areas such as the Al Haouz region. Given the high prevalence of probable PTSD (35.3%), integrating mental health and psychosocial support (MHPSS) into emergency response is essential. Services should be accessible, culturally adapted, and delivered through community-based approaches that leverage existing structures such as religious networks and local leadership. Particular attention must be given to vulnerable groups including women, widows, low-income families, the elderly, and individuals with limited education, through targeted psychoeducation, peer support, and outreach in isolated areas. Building trust and improving communication with institutions are also critical to reduce distress and ensure fair access to aid. Expanding mental health literacy via public messaging and training health workers in primary care can further improve early detection and reduce stigma. Finally, psychosocial interventions should also be accompanied by rigorous monitoring and evaluation, as well as integrated with broader reconstruction strategies such as housing, livelihood restoration, and education. Only by aligning mental health promotion with structural recovery efforts can sustainable psychological resilience and community rebuilding be achieved.

## 7. CONCLUSION

The present research investigated the psychological consequences of the Al Haouz earthquake through an integrated analysis of posttraumatic stress symptoms and coping strategies adopted by the affected population. By combining quantitative assessments and qualitative narratives, this study provided a layered understanding of how individuals experience, process, and adapt to traumatic natural disasters in the Moroccan sociocultural context.

A central finding of this inquiry was the unequal distribution of psychological impact, revealing sharp disparities across gender, socioeconomic status, geographic location, and degree of exposure to material and human losses. Women, individuals with lower educational attainment, rural residents, and participants who endured severe damage or bereavement were disproportionately vulnerable to PTSD. Yet alongside this vulnerability, the study also highlighted powerful expressions of resilience: spiritual grounding, social solidarity, and shifts in life priorities emerged as protective responses embedded in the Moroccan cultural fabric. Qualitative accounts demonstrated how personal experience, cultural values, and structural conditions intertwine to influence psychological outcomes.

Methodologically, this study's strengths lie in its robust sample size, its integration of rural and urban voices, and its mixed-methods design, which enabled a dialogue between statistical patterns and human testimonies. However, several limitations must be acknowledged. The reliance on self-report measures may have introduced reporting bias, particularly in a context where emotional expression is shaped by cultural norms. The cross-sectional design limited insight into the evolution of symptoms over time, and some marginalized or remote populations remained underrepresented despite field efforts.

## *7. Conclusion*

Future research should consider longitudinal designs to monitor the evolution of trauma responses and the long-term efficacy of coping strategies. It would also be beneficial to expand access to remote or isolated communities to capture even more diverse experiences. Finally, greater attention should be given to the development of culturally grounded, community-based mental health interventions that promote collective healing and preparedness for future similar contexts.

Beyond that, this study carries a social mission: to give visibility to overlooked distress and to guide effective, locally grounded mental health interventions taking into account the main issues and daily struggles. It ultimately contributes to a deeper understanding of disaster mental health in Morocco and similar settings, while underscoring the urgent need for systemic integration of psychological care into national crisis response infrastructures. The Al Haouz earthquake called to rethink disaster recovery as not just rebuilding homes, but also rebuilding hope, dignity, and psychological well-being.

## 8. REFERENCES

Abramson, D. M., Grattan, L. M., Mayer, B., Colten, C. E., Arosemena, F. A., Rung, A. L., & Lichtveld, M. (2015). The resilience activation framework: a conceptual model of how access to social resources promotes adaptation and rapid recovery in post-disaster settings. Journal of Behavioral Health Services & Research, 42(1), 42–57.

Ai, A. L., Cascio, T., Santangelo, L. K., & Evans-Campbell, T. (2005). Hope, meaning, and growth following the September 11, 2001, terrorist attacks. Journal of Interpersonal Violence, 20(5), 523–548.

Aldrich, D. P. (2012). Building resilience: Social capital in post-disaster recovery. University of Chicago Press.

AlloDocteurs Africa. (2023). Earthquake in Morocco: The difficult care of psychological wounds. AlloDocteurs Africa. https://www.allodocteurs.africa/seisme-au-maroc-la-difficile-prise-en-charge-des-blessures-mentales-8233.html

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). American Psychiatric Publishing.

Aydın, A., Şirin Gök, M., Çiftçi, B., & Kılınç, C. (2025). Trauma levels and religious coping of earthquake survivors with chronic diseases. Disaster Medicine and Public Health Preparedness, 19(e134), 1–5. https://doi.org/10.1017/dmp.2025.97

Baral, I. A., & K.C., B. (2019). Post-traumatic stress disorder and coping strategies among adult survivors of earthquake, Nepal. BMC Psychiatry, 19(1), 118. https://doi.org/10.1186/s12888-019-2090-y

Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., & Keane, T. M. (2016). Psychometric properties of the PTSD Checklist for DSM-5 (PCL-5) in veterans. Psychological Assessment, 28(11), 1379–1391. https://doi.org/10.1037/pas0000254

Brooks, R., McKinlay, A., Marshall, R., & Kessler, M. (2017). Long-term psychological outcomes of natural disasters: A systematic review and meta-analysis. Journal of Affective Disorders, 220, 97–105.

Bryant, R. A., Harvey, A. G., Dang, S. T., Sackville, T., & Basten, C. (2011). The DSM-5 acute stress disorder diagnosis and posttraumatic stress disorder. Psychological Medicine, 41(10), 2141–2150.

Bryant, R. A., O'Donnell, M. L., Creamer, M., McFarlane, A. C., Silove, D., & Armour, C. (2015). The psychiatric sequelae of traumatic injury. American Journal of Psychiatry, 172(3), 270–277.

Carmassi, C., Casu, G., Rossi, A., & Dell'Osso, L. (2014). Post-traumatic stress disorder in the L'Aquila 2009 earthquake survivors: A follow-up study. Journal of Affective Disorders, 149(1–3), 320–326.

Carr, V. J., Lewin, T. J., Kenardy, J. A., Webster, R. A., Hazell, P. L., Carter, G. L., & Williamson, M. (1995). Psychological sequelae of the 1989 Newcastle earthquake: III. Role of vulnerability factors in post-disaster morbidity. Psychological Medicine, 27(1), 179–190.

Carr, V. J., Lewin, T. J., Webster, R. A., Hazell, P. L., Kenardy, J. A., & Carter, G. L. (1997). Psychological sequelae of the 1989 Newcastle earthquake: I. Community disaster experiences and psychological morbidity 6 months post-disaster. Psychological Medicine, 27(1), 167–178.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. International Journal of Behavioral Medicine, 4(1), 92–100.

Cavallo, E., & Noy, I. (2011). The economics of natural disasters: A survey. International Review of Environmental and Resource Economics, 5(1), 63–102.

Cénat, J. M., McIntee, S. E., Blais-Rochette, C., & Noorishad, P.-G. (2020). Psychological effects of the 2010 Haiti earthquake on the Haitian diaspora in North America: a systematic review and meta-analysis. Journal of Affective Disorders, 269, 20–26.

Creswell, J. W., & Plano Clark, V. L. (2018). Designing and conducting mixed methods research (3rd ed.). Sage Publications.

Dai, W., Chen, L., Lai, Z., Li, Y., Wang, J., & Liu, A. (2016). The incidence of post-traumatic stress disorder among survivors after earthquakes: a systematic review and meta-analysis. BMC Psychiatry, 16, 188. https://doi.org/10.1186/s12888-016-0891-9

Evans-Lacko, S., Aguilar-Gaxiola, S., Alikhani, M., et al. (2018). Socioeconomic status and mental health. The Lancet Psychiatry, 5(6), 465–474.

Foa, E. B., Keane, T. M., Friedman, M. J., & Cohen, J. A. (2009). Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies. Guilford Press.

Foa, E. B., et al. (2019). Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies (2nd ed.). Guilford Press.

Foa, E. B., & Rothbaum, B. O. (1998). Treating the trauma of rape: Cognitive-behavioral therapy for PTSD. Guilford Press.

Galea, S., Nandi, A., & Vlahov, D. (2005). The epidemiology of post-traumatic stress disorder after disasters. Epidemiologic Reviews, 27(1), 78–91.

Galea, S., et al. (2005). Exposure to earthquake-related stressors and risk for PTSD. Annals of Epidemiology.

Goenjian, A. K., Molina, L., Steinberg, A. M., & Fairbanks, L. A. (2001). Posttraumatic stress and depressive reactions among Nicaraguan adolescents after Hurricane Mitch. American Journal of Psychiatry, 158(5), 788–794.

Güleç, G., Çoban, S., & Erten, M. (2023). Psychological interventions after the 2023 Turkey Earthquake: A focus on long-term recovery. International Journal of Disaster Psychology.

İlhan, B., Berikol, G. B., Eroğlu, O., & Deniz, T. (2023). Prevalence and associated risk factors of post-traumatic stress disorder among survivors of the 2023

Turkey earthquake. The American Journal of Emergency Medicine, 72, 39–43. https://doi.org/10.1016/j.ajem.2023.07.026

Inter-Agency Standing Committee (IASC). (2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC.

International Federation of Red Cross and Red Crescent Societies (IFRC). (2023). Response to Al Haouz earthquake.

International Labour Organization (ILO). (2011). Pakistan floods 2010: Recovery and reconstruction needs assessment. [Report].

International Labour Organization (ILO). (2012). International Standard Classification of Occupations: ISCO-08. Geneva: International Labour Organization.

Jayawickreme, N., & Hobfoll, S. E. (2013). Translating research into practice in disaster mental health. Current Opinion in Psychiatry, 26(4), 429–435.

Kaniasty, K. (2012). Predicting social psychological well-being following trauma: the role of postdisaster social support. Psychological Trauma: Theory, Research, Practice, and Policy, 4(1), 22–33.

Kaniasty, K. (2020). Social support, interpersonal, and community dynamics following disasters caused by natural hazards. Current Opinion in Psychology, 32, 105–109.

Karatzias, T., Chouliara, Z., Maxton, F., et al. (2022). Posttraumatic stress and socioeconomic status after disasters. European Journal of Psychotraumatology, 13(1), 2034204.

Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., et al. (2017). Trauma and PTSD in the WHO World Mental Health Surveys. European Journal of Psychotraumatology, 8(5), 1353383.

Koenig, H. G. (2022). Religion, spirituality, and health: The research and clinical implications. ISRN Psychiatry.

Liu, M., Yang, Y., Li, W., et al. (2022). Socioeconomic status and PTSD after natural disasters. International Journal of Disaster Risk Reduction, 73, 102892.

Marmar, C. R., Weiss, D. S., Metzler, T. J., & Delucchi, K. L. (1996). Longitudinal course and predictors of continuing distress following critical incident exposure in emergency services personnel. Journal of Nervous and Mental Disease, 184(6), 408–414.

Martinez, L. M., Beaulieu, K., & Altmaier, E. (2018). Helping soldiers heal: the impact of altruistic leadership on post-traumatic stress disorder. Military Medicine, 183(9–10), e509–e515.

Médecins du Monde. (2023). Earthquake in Morocco: Psychological support for victims is essential right now. Médecins du Monde. https://medecinsdumonde.ch/news/seisme-au-maroc-le-soutien-psychologique-aux-victimes-est-indispensable-des-maintenant/

Medi1News. (2023a, September 12). Earthquake in Morocco: Solidarity initiatives multiply to help the victims. Medi1News. https://www.medi1news.com/fr/article/293278.html

Medi1News. (2023b). Earthquake: What psychological follow-up for survivors? Medi1News. https://medi1news.com/fr/article/295475.html

Medi1TV. (2023, September 13). Al Haouz earthquake: Extraordinary work by the security forces. Medi1TV. https://medi1tv.com/fr/episode/89628/S%C3%A9isme-d-Al-Haouz–un-travail-extraordinaire-des-forces-de-l-ordre

Morina, N., Malek, M., Nickerson, A., & Bryant, R. A. (2017). Meta-analysis of interventions for posttraumatic stress disorder and depression in adult survivors of mass violence in low- and middle-income countries. Depression and Anxiety, 34(8), 679–691.

Münich, R. E. (2013). Haiti earthquake 2010: The long-term economic and psychological impact. Journal of Disaster Research, 8(4), 500–512.

***8. REFERENCES***

Neria, Y., Nandi, A., & Galea, S. (2008). Post-traumatic stress disorder following disasters: A systematic review. Psychological Medicine, 38(4), 467–480. https://doi.org/10.1017/S0033291707001353

Neria, Y., Galea, S., & Norris, F. H. (Eds.). (2009). Mental health and disasters. Cambridge University Press.

Neria, Y., Shultz, J. M., & Pfefferbaum, B. (2018). Long-term psychological consequences of natural disasters. Current Psychiatry Reports.

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. Perspectives on Psychological Science, 3(5), 400–424.

Norris, F. H., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. Psychiatry, 65(3), 207–239.

North, C. S., Ringwald, P. A., Downs, D. L., & Pollio, D. E. (2010). Alcohol use disorders and drinking among survivors of the 9/11 attacks on the World Trade Center in New York City. Comprehensive Psychiatry, 51(5), 424–433.

Office for the Coordination of Humanitarian Affairs (OCHA). (2023). Morocco Earthquake Situation Report No. 4 (26 September 2023).

Okan, N., Şahin, Y., Genç, H., & Demirhan, M. (2025). Harnessing spiritual coping to foster resilience: insights from post-trauma mental health after the Kahramanmaraş earthquake. Humanities and Social Sciences Communications, 12(1), 857. https://doi.org/10.1057/s41599-025-05318-5

Outaleb, A. (2023). Psychological responses to the Al Haouz earthquake: Challenges and interventions.

Park, C. L. (2010). Making sense of the meaning literature: an integrative review of meaning making and its effects on adjustment to stressful life events. Psychological Bulletin, 136(2), 257–301.

Patel, V., Saxena, S., Lund, C., et al. (2018). The Lancet Commission on global mental health and sustainable development. The Lancet, 392(10157), 1553–1598.

Shinfuku, N. (2012). Disaster mental health: Lessons learned from the Great East Japan Earthquake.

Solnit, R. (2009). A paradise built in hell: The extraordinary communities that arise in disaster. Viking.

Tang, B., Deng, Q., Glik, D., Dong, J., & Zhang, L. (2017). A meta-analysis of risk factors for post-traumatic stress disorder (PTSD) in adults and children after earthquakes. International Journal of Environmental Research and Public Health, 14(12), 1537.

Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: conceptual foundations and empirical evidence. Psychological Inquiry, 15(1), 1–18.

United Nations International Children's Emergency Fund (UNICEF). (2023). Morocco earthquake situation report.

United Nations News (UN News). (2023). Solidarity and resilience in Morocco after the earthquake.

United States Geological Survey (USGS). (2023). Rapid source characterization: 2023 Mw 6.8 Al Haouz, Morocco earthquake.

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD Checklist for DSM-5 (PCL-5). U.S. Department of Veterans Affairs, National Center for PTSD. https://www.ptsd.va.gov

Wilkinson, R., & Marmot, M. (2020). Social determinants of health: The solid facts (3rd ed.). World Health Organization.

Williams, J., Poijula, S., Ehring, T., & Murphy, S. (2018). Meaning making in the context of disasters. In E. M. Altmaier (Ed.), Reconstructing meaning after trauma (pp. 89–105). Academic Press.

World Health Organization (WHO). (2013a). Building resilience: A key to disaster prevention and recovery. World Health Organization.

World Health Organization (WHO). (2013b). Building back better: Sustainable mental health care after emergencies. World Health Organization.

Yıldırım, D., Kaya, A., & Altun, Z. (2023). Community-based interventions for post-traumatic stress disorder in earthquake survivors: Evidence from Turkey. Community Mental Health Journal.

Zhang, Z., Zhang, J., Zhang, X., & Cheng, W. (2015). Longitudinal trajectories of posttraumatic stress disorder symptoms among adolescents after the Wenchuan earthquake in China. Journal of Traumatic Stress, 28(3), 272–279.

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment, 52(1), 30–41. https://doi.org/10.1207/s15327752jpa5201_2

# 9. Appendices

## A. Flyer


## B. Informed Consent

**Consentimento Informado**
Code| IMP-EM-PE-17_03

Monte de Caparica, 20/12/2024

Caro(a) Senhor(a)

No âmbito do Mestrado em Psicologia Clínica e da Saúde da Universidade de Egas Moniz, sob a orientação da Professora Doutora Marta Reis, solicita-se autorização para participar no estudo "Terramoto de Al Haouz (Marrocos, 2023): Análise do impacto psicológico a longo prazo e das estratégias de enfrentamento entre os residentes da região de acordo com o seu ambiente e experiência".

O objetivo é compreender o impacto psicológico a longo prazo e as estratégias de sobrevivência. A sua participação consistirá em responder a um questionário online, que abordará informações sobre a experiência do acontecimento, as estratégias de enfrentamento utilizadas e uma escala que avalia o nível de stress pós-traumático (PTSD). No fim do questionário online, quem referiu ter tido experiência do terramoto, será convidado a participar numa entrevista semi-estruturada, de forma voluntária, para se realizar uma análise mais profunda da experiência, da perceção do terramoto e das estratégias que puseram em prática para lidar com o trauma. Para poder participar neste estudo terá de ter no mínimo 18 anos.

A participação no estudo online é anónima e voluntária. A não participação não lhe causará qualquer prejuízo. Podendo desistir a qualquer momento. Relativamente a quem participar na segunda fase na entrevista, os dados obtidos nesta serão anonimizados. Este estudo pode trazer benefícios, tais como ajudar a identificar estratégias comuns de enfrentamento durante um evento sísmico como este e, assim, fornecer informações sobre intervenções de saúde mental adequadas, especialmente na presença de sintomas de impacto psicológico a longo prazo relacionados com esta experiência. No entanto, este estudo pode envolver riscos potenciais, como a revisitação de memórias angustiantes que os participantes podem não ter processado completamente antes.

As informações recolhidas destinam-se exclusivamente a tratamento estatístico e/ou publicação e serão tratadas pelo orientador. A recolha é anónima e confidencial, garantindo que a identidade não será revelada em quaisquer relatórios ou publicações.

ACEITO/NÃO ACEITO participar neste estudo, confirmando que fui informado(a) sobre as condições do mesmo e que não tenho dúvidas.

(Assinatura do participante ou, no caso de menores, do pai/mãe ou do tutor legal)

**Code| IMP-EM-PE-17_03**
**Informed Consent**

Monte de Caparica, 17/10/2024

Dear Sir or Madam,

As part of the Master's program in Psychology at the University of Marrakech, under the guidance of Professor Dr. Marta Reis, permission is requested to participate in the study "Al Haouz Earthquake (Morocco, 2023): Analysis of the Long-Term Psychological Impact and Coping Strategies among Residents of the Region According to Their Environment and Experience," targeting residents of the région affected by the earthquake. The objective is to understand the long-term psychological impact and coping strategies of these individuals, which will involve participation through online questionnaires and interviews with the volunteers. Participation in this study is voluntary. Your non-participation will not cause you any harm.

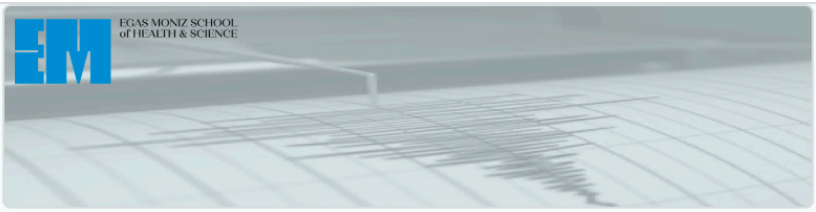
This study may bring benefits such as increased knowledge of PTSD and coping strategies that can inform mental health interventions in similar contexts. This study may involve potential risks such as revisiting distressing memories that participants may have not processed fully before.

The information collected is intended solely for statistical treatment and/or publication and will be handled by the supervisor(s) and/or their delegates. The collection is anonymous and confidential.

I ACCEPT/DO NOT ACCEPT to participate in this study, confirming that I have been informed about its conditions and that I have no doubts.

(Signature of the participant or, in the case of minors, of the father/mother or legal guardian)

## C. Online Questionnaire




Section 1 sur 27

**Catastrophes Naturelles & Santé Mentale:** Analyse de l'impact psychologique à long terme et des stratégies d'adaptation

**علم النفس والكوارث الطبيعية:** تحليل الأثر النفسي طويل الأمد واستراتيجيات التأقلم

Description du formulaire

Veuillez choisir la langue du questionnaire *

المرجو اختيار لغة الأسئلة.

- Français
- العربية

Après la section 1 Passer à la section suivante

Section 2 sur 27

***Psychologie et catastrophes naturelles: Analyse de l'impact psychologique à long terme et des stratégies d'adaptation.***

**Bienvenue et merci de votre intérêt pour cette étude.**

Dans le cadre du projet de thèse de M2 Psychologie Clinique de la santé à *l'Université Egas Moniz Lisboa*, , nous sommes reconnaissants de vous faire part de notre étude nommée "***Séisme d'Al Haouz (Maroc, 2023): Analyse de l'impact psychologique à long terme et des stratégies d'adaptation chez les victimes en fonction de leur environnement et de leur expérience***"

Celle-ci a pour objectif de **comprendre et d'explorer les répercussions de cette expérience sur la vie quotidienne des individus, tout en identifiant les stratégies développées afin d'y faire face.**

En effet, les catastrophes naturelles, notamment les séismes, peuvent **laisser des traces profondes** en raison de leur **caractère soudain et imprévisible.** Provocant non seulement des dégâts matériels , mais affectant également la **santé mentale** des personnes touchées de manière durable.

Dans ce contexte, nous estimons essentiel d'explorer ces impacts afin d'identifier **des pistes et mieux comprendre les enjeux psychologiques** ainsi que **les besoins en terme de soutien émotionnel**, tant au niveau individuel que collectif.

**Consentement éclairé**

Nous vous remercions de consacrer un moment pour remplir ce questionnaire **rapide et strictement anonyme.** Il n'y a ni bonne ni mauvaise réponse, les informations recueillies resteront confidentielles et seront utilisées exclusivement à des fins de recherche scientifique.

**En procédant à ce questionnaire, je confirme avoir plus de 18 ans et être conscient(e) que mes réponses sont anonymes et seront utilisées uniquement à des fins de recherche.** *

- ○ Oui
- ○ Non

Après la section 3 Passer à la section suivante

Section 4 sur 27

Titre de la section (facultatif)

Description (facultative)

**1. A quel événement sismique avez vous assisté?** *

- ○ Séisme d'Al Haouz
- ○ Je n'ai jamais assisté à un événement sismique
- ○ Autre...

Après la section 4 Passer à la section suivante

Section 5 sur 27

Titre de la section (facultatif)

Description (facultative)

**Autre:** Veuillez indiquer le **lieu et la date du séisme** *

Réponse courte

Après la section 5 Passer à la section suivante

**Section 1: Données Démographiques**

Description (facultative)

**1.1. Âge** *

1. 18 - 25 ans
2. 26 - 44 ans
3. 45 - 64 ans
4. 65 ans et plus

**1.2. Sexe** *

1. Homme
2. Femme

**1.3. Situation familiale** *

1. Célibataire
2. Marié(e)
3. Divorcé(e)
4. Veuf/veuve

**1.4.** Quelle est votre **situation professionnelle actuelle?** *

- ○ Sans emploi / Étudiant / Chômage
- ○ Ouvrier(ère) / Employé(e) de service (ménage, sécurité, etc...)
- ○ Employé(e) qualifié(e)
- ○ Cadre supérieur / Ingénieur / Profession libérale
- ○ Chef d'entreprise / Entrepreneur / Commerçant
- ○ Retraité(e)
- ○ Autre...

**1.5.** Quel est votre **niveau d'études le plus élevé?** *

- ○ Non scolarisé(e)
- ○ College / Lycée
- ○ Baccalaureat
- ○ Université
- ○ Passer à la question suivante
- ○ Autre...

Après la section 6 Passer à la section suivante

Section 7 sur 27

**Expérience du séisme**

Les réactions à un tel événement peuvent différer considérablement d'une personne à l'autre, chacune étant une réponse **légitime** face à des circonstances aussi **intenses et imprévisibles.**

Nous vous encourageons à prendre un instant pour réfléchir à **votre propre expérience** de cet événement. Bien que cet exercice puisse **paraître difficile** pour certains, il peut offrir des informations importantes sur vos émotions et vos stratégies d'adaptation, permettant ainsi une meilleure compréhension de votre **ressenti** et de **l'impact à long terme** de cette épreuve.

**2.1. A quelle distance vous trouviez vous de l'épicentre (Talat N'Yaaqoub) lors du séisme d'Al Haouz?** *

*( Nb: Si votre expérience concerne un autre séisme, veuillez indiquer la distance approximative par rapport à son épicentre )*

- ○ Moins de 10 km (Ighil, Talat N'Yaaqoub, autres villages proches de l'épicentre)
- ○ Entre 10 et 50 km (Amizmiz, Ouirgane, Asni, Chichaoua, Ijoukak,...)
- ○ Entre 50 et 100 km (Marrakech, Taroudant, Tahanaout...)
- ○ Entre 100 et 250 km (Ouarzazate, Rabat, Béni Mellal, Safi...)
- ○ Plus de 250 km (Casablanca, Agadir, Essaouira, Fès...)
- ○ Je ne sais pas / Je ne me souviens pas
- ○ Autre...

**2.2. Comment se caractérise la zone dans laquelle vous étiez lors du séisme?** *

- ○ Zone Urbaine
- ○ Zone Rurale

**2.3. Où vous trouviez-vous au moment de l'événement sismique?** *

- ○ En extérieur/ Dans la rue
- ○ En voiture
- ○ Transport en commun
- ○ Maison / Rez de chaussée
- ○ Á l'étage d'un Immeuble / Bâtiment
- ○ Centre commercial, Cinéma, restaurant
- ○ Établissement public (école, hôpital, mosquée, etc.)
- ○ Autre...

**2.4. Avec qui étiez vous lors de l'événement?** *

- ☐ Tout(e) Seul(e)
- ☐ Avec des inconnus
- ☐ Avec des membres de la famille
- ☐ Avec des amis
- ☐ Avec des collègues de travail
- ☐ Autre...

**2.5. Comment Avez-vous été impacté par cet événement ?** *

- [ ] Dégâts matériels MINEURS (Objets cassés, fissures légères dans les murs, meubles ...
- [ ] Dégâts matériels MODÉRÉS (Fissures importantes, murs fragilisés, nécessité de rép...
- [ ] Dégâts matériels MAJEURS (Effondrement partielle ou totale du foyer, destruction d'...
- [ ] Perte financière importante (Perte d'emploi ou d'activité à cause du séisme)
- [ ] Décès d'un proche (famille ou entourage proche)
- [ ] Blessure légère (Égratignures, contusions...)
- [ ] Blessure grave (Fracture, hospitalisation, intervention chirurgicale nécessaire)
- [ ] Aucun dommage ni perte en lien avec cet événement
- [ ] Je préfère ne pas répondre
- [ ] Autre...

Après la section 7 Passer à la section suivante

**Quelles ont été vos stratégies d'adaptation?**

Les stratégies d'adaptation, ou coping, désignent les moyens par lesquels chacun réagit face à des situations difficiles. Elles diffèrent selon les ressources personnelles et les circonstances uniques de l'événement, offrant un aperçu global de la manière dont chacun fait face à l'adversité.

**3.1. Comment avez-vous réagi dans l'immédiat lorsque vous avez perçu l'arrivée des secousses ?** *

*(Cochez la/les affirmations qui correspondent le mieux à votre situation)*

- [ ] Peur intense / panique / angoisse soudaine
- [ ] Je suis resté(e) figé(e), incapable de réagir immédiatement /Réaction tardive
- [ ] J'ai crié, pleuré ou eu une réaction émotionnelle forte
- [ ] J'ai couru ou cherché à fuir immédiatement
- [ ] Je me suis mis(e) à l'abri
- [ ] J'ai aidé ou rassuré des proches / d'autres personnes autour de moi
- [ ] J'ai ressenti des symptômes physiques (tremblements, vertiges, nausées, palpitation...
- [ ] Je suis resté(e) calme et j'ai attendu la fin des secousses
- [ ] Je n'ai pas perçu de secousses
- [ ] Réaction tardive / moment de sidération
- [ ] Autre...

**3.2. Quelles stratégies avez-vous adoptées dans le mois qui a suivi l'événement ?** *

*(Cochez la/les affirmations qui correspondent le mieux à votre situation)*

- [ ] J'ai essayé de m'occuper, et de me distraite pour éviter de penser à ce qui s'est passé.
- [ ] J'ai ressenti un stress ou une anxiété persistante.
- [ ] J'ai évité certains lieux ou situations me rappelant le séisme.
- [ ] J'ai eu des troubles du sommeil (insomnie, cauchemars, réveils fréquents).
- [ ] J'ai eu des difficultés de concentration ou une fatigue inhabituelle.
- [ ] J'ai cherché du soutien auprès de mes proches.
- [ ] J'ai consulté un professionnel de santé (psychologue, médecin, etc.).
- [ ] J'ai essayé de voir la situation de manière positive et de relativiser.
- [ ] J'ai eu du mal à gérer mes émotions (colère, tristesse, irritabilité).
- [ ] Je me suis informé(e) sur les séismes et la gestion des catastrophes
- [ ] J'ai été amené à réfléchir et discuter sur le sens de la vie.
- [ ] Je me suis tourné vers des pratiques spirituelles plus régulières (prière, méditation, e...
- [ ] Je me suis dit que ce n'était pas réel et je suis passé à autre chose.
- [ ] J'ai essayé de voir la situation sous un point de vue plus positif/ avec humour
- [ ] J'ai tenté d'accepter la réalité de ma nouvelle situation et tenté de vivre avec.
- [ ] J'ai ressenti de la culpabilité, je me suis auto-critiqué
- [ ] Je préfère ne pas répondre
- [ ] Autre...

Après la section 8 Passer à la section suivante

**Dans le mois ayant suivi l'événement,** dans quelle mesure avez-vous été affecté par:

*Une seule réponse possible par ligne.*

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| **Des souvenirs répétés, pénibles et involontaires?** | ○ | ○ | ○ | ○ | ○ |
| **Des rêves/ cauchemars répétés et pénibles en lien avec l'expérience du Séisme?** | ○ | ○ | ○ | ○ | ○ |
| **Se sentir ou agir soudainement comme si vous viviez à nouveau l'expérience du Séisme?** | ○ | ○ | ○ | ○ | ○ |
| **Se sentir mal quand quelque chose vous rappelle le Séisme ?** | ○ | ○ | ○ | ○ | ○ |
| **Avoir de fortes réactions physiques lorsque quelque chose vous rappelle l'événement (accélération cardiaque, difficulté respiratoire, sudation) ?** | ○ | ○ | ○ | ○ | ○ |
| **Essayer d'ignorer les souvenirs, pensées, et sentiments liés à l'événement ?** | ○ | ○ | ○ | ○ | ○ |
| **Essayer d'éviter les personnes et les choses qui vous rappellent cet événement (lieux, personnes, activités, objets) ?** | ○ | ○ | ○ | ○ | ○ |
| **Des difficultés à vous rappeler des parties importantes de l'événement ?** | ○ | ○ | ○ | ○ | ○ |
| **Des croyances négatives sur vous-même, les autres, le monde (Ex: "je suis une mauvaise personne", "j'ai quelque chose qui cloche", "je ne peux avoir confiance en personne", "le monde est dangereux") ?** | ○ | ○ | ○ | ○ | ○ |
| **Vous blâmer ou blâmer quelqu'un d'autre pour l'événement ou ce qui s'est produit ensuite ?** | ○ | ○ | ○ | ○ | ○ |
| **Avoir des sentiments négatifs intenses tels que peur, colère, culpabilité, ou honte ?** | ○ | ○ | ○ | ○ | ○ |
| **Perdre de l'intérêt pour des activités que vous aimiez auparavant ?** | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| Vous sentir distant ou coupé des autres ? | ⬭ | ⬭ | ⬭ | ⬭ | ⬭ |
| Avoir du mal à éprouver des sentiments positifs (incapacité de ressentir de la joie ou de l'amour envers vos proches) ? | ⬭ | ⬭ | ⬭ | ⬭ | ⬭ |
| Comportement irritable, explosions de colère, ou agressivité ? | ⬭ | ⬭ | ⬭ | ⬭ | ⬭ |
| Prendre des risques inconsidérés ou avoir des conduites qui pourraient vous mettre en danger ? | ⬭ | ⬭ | ⬭ | ⬭ | ⬭ |
| Être en état de « super-alerte », hyper vigilant ou sur vos gardes ? | ⬭ | ⬭ | ⬭ | ⬭ | ⬭ |
| Sursauter facilement ? | ⬭ | ⬭ | ⬭ | ⬭ | ⬭ |
| Avoir du mal à vous concentrer ? | ⬭ | ⬭ | ⬭ | ⬭ | ⬭ |
| Avoir du mal à trouver le sommeil ou à rester endormi ? | ⬭ | ⬭ | ⬭ | ⬭ | ⬭ |

**Point sur la situation aujourd'hui**

Description (facultative)

**5.1. Avec du recul, comment vous sentez-vous aujourd'hui en repensant à cet événement ?** *

- [ ] Je me sens bien, je n'ai pas ressenti d'impact particulier.
- [ ] J'ai longtemps ressenti un peu d'inquiétude , mais celle-ci s'est atténué avec le temps.
- [ ] Je fais des cauchemars ou je repense souvent au séisme.
- [ ] Je ressens encore une peur constante qu'un autre séisme survienne.
- [ ] Je sursaute au moindre bruit ou mouvement brusque.
- [ ] Je préfère ne pas répondre
- [ ] Autre...

**5.2.** Sur une échelle de 1 à 10, **À quel point vous sentez-vous aujourd'hui capable de gérer les effets du séisme dans votre vie quotidienne ?** *

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pas du tout capable | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Tout à fait capable |

**5.3. Y a-t-il autre chose que vous souhaiteriez partager sur votre expérience du séisme ou sur la manière dont vous vous sentez aujourd'hui ?** *

- ○ Oui
- ○ Non

Après la section 10 Passer à la section suivante

**5.4. Exprimez vous!**

Réponse longue

Après la section 11 Passer à la section suivante

Section 12 sur 27

**En raison de la subjectivité des perceptions de cet événement, nous serions heureux, si vous le souhaitez, d'explorer cela en détail lors d'un entretien individuel.**

*Celui-ci sera entièrement anonyme, et vous pourrez y mettre fin à tout moment. L'entretien pourra se dérouler en présentiel ou à distance, selon vos préférences et disponibilités.*

**6.1. Aimeriez-vous être recontacté pour un entretien plus approfondi?** *

- ○ Oui
- ○ Non

Après la section 12 Passer à la section suivante

Section 13 sur 27

**Veuillez indiquer vos coordonnées afin que l'on puisse vous recontacter**

*Vous pouvez n'indiquer qu'un seul moyen de contact si vous ne disposez pas des deux. Vos coordonnées resteront strictement confidentielles.*

**Adresse Mail**

Réponse longue

**Numéro de téléphone / WhatsApp**

Réponse longue

**Nom** *( optionnel )*

Réponse longue

**Merci!**

Vos idées et expériences sont **inestimables** pour nous et jouent un rôle crucial dans **l'amélioration de notre compréhension des impacts psychologiques à long terme de ce type d'événement**.
En partageant votre point de vue, vous contribuez à une plus grande **sensibilisation aux défis auxquels sont confrontés les individus de la communauté**.
Nous vous remercions sincèrement pour votre participation à cette étude, et nous nous engageons à assurer que votre contribution soit traitée avec la plus grande confidentialité et le plus grand respect.

Hiba Touhami - *Etudiante en M2 Psychologie Clinique de la santé - Egas Moniz University*
*Contact:* ***catapsy1@gmail.com***

Après la section 14 Envoyer le formulaire

**مرحباً وشكراً لاهتمامكم بهذه الدراسة**

في إطار مشروع رسالة **الماجستير في علم النفس السريري للصحة** بجامعة Egas Moniz في لشبونة، يسرنا تقديم دراستنا بعنوان:

***«زلزال الحوز (المغرب، 2023): تحليل التأثير النفسي طويل الأمد واستراتيجيات التأقلم لدى الضحايا بناءً على بيئتهم وتجاربهم.»***

تهدف هذه الدراسة إلى فهم واستكشاف **تداعيات هذه التجربة على الحياة اليومية للأفراد**، مع تحديد **الاستراتيجيات التي اعتمدوها للتأقلم معها.**

إن الكوارث الطبيعية، وخاصة الزلازل، تترك **آثاراً عميقة** نظراً لطابعها المفاجئ وغير المتوقع؛ فهي **لا تسبب أضراراً مادية فحسب**، بل تؤثر أيضاً على **الصحة النفسية** للمصابين على المدى الطويل.

في هذا السياق، نعتقد أنه من الأساسي **استكشاف هذه الآثار** من أجل تحديد و فهم أعمق **للمشاكل النفسية** التي ينطوي عليها الأمر و**الاحتياجات** من حيث **الدعم النفسي** على المستويين **الفردي والجماعي.**

Après la section 15 Passer à la section suivante

Section 16 sur 27

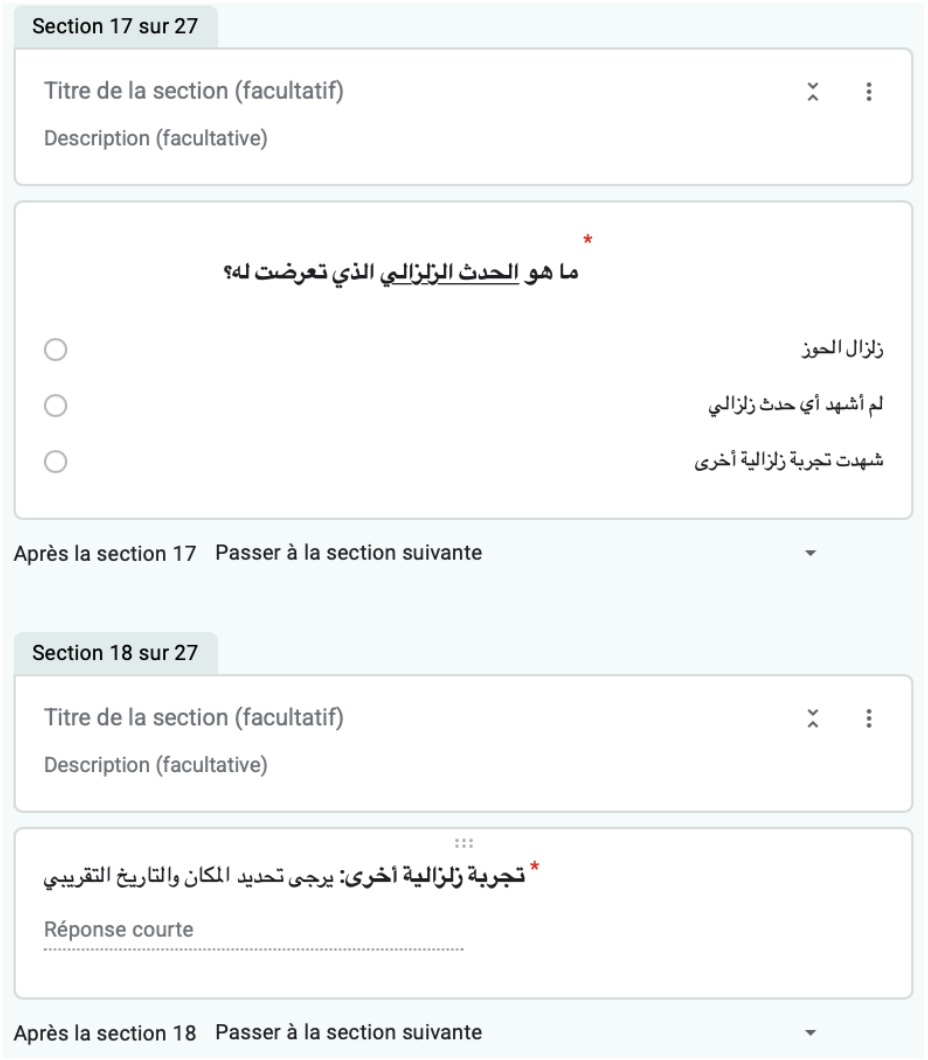
Titre de la section (facultatif)

نشكركم على تخصيص وقتكم لإكمال هذا الاستبيان **السريع والمجهول الهوية**. ليست هناك أي **إجابة صحيحة أو خاطئة**، وستبقى المعلومات التي تم جمعها **سرية** وسيتم استخدامها **حصرياً لأغراض البحث العلمي.**

* باستكمال هذا الاستبيان، أؤكد أن عمري **أكثر من 18 سنة**، وأدرك أن إجاباتي ستكون **سرية** وسيتم استخدامها لأهداف البحث فقط

- نعم
- لا

Après la section 16 Passer à la section suivante


Section 17 sur 27
Titre de la section (facultatif)
Description (facultative)
* ما هو الحدث الزلزالي الذي تعرضت له؟
زلزال الحوز
لم أشهد أي حدث زلزالي
شهدت تجربة زلزالية أخرى
Après la section 17 Passer à la section suivante
Section 18 sur 27
Titre de la section (facultatif)
Description (facultative)
* تجربة زلزالية أخرى: يرجى تحديد المكان والتاريخ التقريبي
Réponse courte
Après la section 18 Passer à la section suivante

**1. البيانات الديموغرافية**

Description (facultative)

**1.1. يرجى تحديد عمرك** *

1. 18 - 25 سنة
2. 26 - 44 سنة
3. 45 - 64 سنة
4. أكثر من 65 عامًا

**1.2. هل أنت** *

1. امرأة
2. رجل

**1.3 الموقف العائلي** *

1. أعزب
2. متزوج أو متزوجة
3. مطلق أو مطلقة
4. أرمل أو أرملة
5. أخرى

**1.4. ما هو وضعك المهني الحالي؟** *

1. طالب/عاطل عن العمل
2. عامل يدوي / موظف خدمات (تنظيف، أمن، إلخ...)
3. موظف ماهر / عامل مهني
4. مسؤول إداري / مهندس / عامل في مهنة حرة
5. مدير شركة / رجل أعمال / صاحب متجر
6. متقاعد

**1.5. ما هو أعلى مستوى تعليمي لديك؟** *

1. بدون تعليم مدرسي
2. مدرسة ثانوية
3. البكالوريا
4. الجامعة
5. شهادة الدكتوراه
6. انتقل إلى السؤال التالي

Après la section 19 Passer à la section suivante

Section 20 sur 27

**التجربة الشخصية لوقوع الزلزال**

يمكن أن تختلف ردود الفعل في مثل هذا الحدث **اختلافًا كبيرًا من شخص لآخر**، حيث أن كل .منها تمثل **استجابة طبيعية وشرعية** لمثل هذه الظروف الشديدة والمتقلبة

*نشجعك على أخذ بعض وقت **للتفكير في تجربتك الخاصة** مع هذا الحدث*

على الرغم من أن هذا قد يبدو **تمريناً صعباً بالنسبة للبعض**، إلا أنه يمكن أن يوفر **معلومات مهمة** حول **مشاعرك وطريقة تأقلمك مع الحدث**، مما يتيح **فهماً أعمق** لما تشعر به والتأثير طويل الأمد لهذه التجربة

**2.1. كم كانت المسافة التي كنت تبعد عن نقطة ارتكاز الزلزال (تلات نيعقوب) أثناء زلزال الحوز؟** *

*يُرجى الإشارة إلى المسافة التقريبية التي تبعدك عن مركز الزلزال إذا كانت تجربتك تتعلق بزلزال (آخر)*

- أقل من 10 كم (إيغيل، تلات نيعقوب، قرى أخرى قريبة من مركز الزلزال)
- بين 10 و50 كم (أمزميز، ورگان، أسني، شيشاوة، إجوكاك، ...)
- بين 50 و100 كم (مراكش، تارودانت، تحناوت ...)
- بين 100 و250 كم (ورزازات، الرباط، بني ملال، آسفي...)
- أكثر من 250 كم (الدار البيضاء، أكادير، الصويرة، فاس...)
- لا أعرف / لا أتذكر

**2.2 كيف توصف المنطقة التي كنت فيها عند وقوع الزلزال؟** *

- منطقة حضرية
- منطقة قروية

**2.3 أين كنت في وقت وقوع الزلزال؟** *

- في الخارج/ في الشارع
- في السيارة
- في وسائل النقل العام
- في المنزل / في طابق أرضي
- في طابق عالٍ من عمارة
- في مركز تسوق، سينما، مطعم...
- في مؤسسة عامة (مدرسة، مستشفى، مسجد، ...)
- Autre...

**2.4. مع من كنت خلال الحدث؟** *

- وحدك
- مع أشخاص لا تعرفهم
- مع أفراد العائلة
- مع الأصدقاء
- مع شركاء العمل
- Autre...

**2.5. ما مدى تأثرك بهذا الحدث؟** *

- أضرار "مادية بسيطة" (أشياء مكسورة، شقوق خفيفة في الجدران، أثاث...)
- أضرار "مادية متوسطة" (شقوق كبيرة، جدران متهالكة تحتاج إلى إصلاحات....)
- أضرار "مادية كبيرة " (انهيار جزئي أو كلي للبيت، تدمير سيارة، فقدان ممتلكات أساسية...)
- خسارة "مالية كبيرة" (فقدان الوظيفة أو العمل بسبب الزلزال)
- وفاة أحد الأقارب (العائلة أو الأصدقاء المقربين)
- تأثير جسدي "بسيط" (خدوش، كدمات، ...)
- تأثير جسدي "شديد" ( حدوث كسر، دخول المستشفى، الحاجة إلى إجراء عملية جراحية)
- لا ضرر أو خسارة فيما يتعلق بهذا الحدث
- أفضّل ألا أجيب
- Autre...

Après la section 20 Passer à la section suivante

Section 21 sur 27

**ما كانت استراتيجيات التأقلم التي استخدمتها؟**

**استراتيجيات التأقلم هي الطرق التي يتفاعل بها الأشخاص** مع المواقف الصعبة. وهي تختلف وفقًا لمصادر شخصية والظروف الفريدة للحدث، وهي تقدم نظرة عامة عن **كيفية تعامل كل شخص في مواجهة المواقف الصعبة**

**3.1 كيف كان رد فعلك المباشر عندما شعرت بالهزات الأرضية؟** *

*(حدد العبارات التي تعبر بأفضل شكل عن وضعك )*

- [ ] خوف شديد/فزع شديد/قلق مفاجئ
- [ ] تجمدت في مكاني، ولم أتمكن من التصرف على الفور
- [ ] صرخت أو بكيت أو كان لدي رد فعل عاطفي قوي
- [ ] جريت أو حاولت الهرب على الفور
- [ ] لجأت إلى الاختباء/ الاحتماء
- [ ] رد فعل متأخر / لحظة صدمة
- [ ] ساعدت أو طمأنت الأشخاص الآخرين من حولي
- [ ] شعرت بأعراض جسدية ( ارتجاف، دوار، غثيان، خفقان،...)
- [ ] حافظت على هدوئي وانتظرت حتى تتوقف الهزات
- [ ] لم أشعر بأي اهتزاز
- [ ] Autre...

*

**3.2. ما هي إحدى الاستراتيجيات التي قمت باعتمادها في الشهر التالي للحدث؟**
*(حدد العبارات التي تعبر بأفضل شكل عن وضعك )*

- [ ] حاولت إبقاء نفسي منشغلاً وملهياً لتجنب التفكير فيما حدث.
- [ ] شعرت بتوتر أو قلق مستمر.
- [ ] تجنبت بعض الأماكن أو المواقف التي تذكرني بما حدث.
- [ ] واجهت صعوبات في النوم ( أرق، كوابيس، استيقاظ بشكل متكرر).
- [ ] واجهت صعوبات في التركيز أو شعرت بتعب غير عادي.
- [ ] طلبت المساعدة من الأشخاص القريبين مني.
- [ ] استشرت أخصائيًا صحيًا (أخصائيًا نفسيًا أو طبيبًا أو غير ذلك).
- [ ] حاولت أن أرى الموقف من وجهة نظر إيجابية وأن أعيد الأمور إلى مسارها الطبيعي.
- [ ] واجهت صعوبة في التحكم في مشاعري (الغضب والحزن وسرعة الانفعال).
- [ ] تعلمت المزيد عن الزلازل وكيفية التعامل مع الكوارث.
- [ ] قادني ذلك إلى التفكير ومناقشة معنى الحياة.
- [ ] لجأت إلى ممارسات روحانية أكثر اعتيادية (الصلاة أو ممارسة التأمل...).
- [ ] أقنعت نفسي بأن الأمر غير واقعي وتابعت حياتي.
- [ ] حاولت أن أتعامل مع الوضع من منظور أكثر إيجابية/ بفكاهة
- [ ] حاولت أن أتقبل واقعية وضعي الجديد وحاولت التعايش معه.
- [ ] شعرتُ بتأنيب الضمير وكنت أنتقد نفسي
- [ ] أفضّل ألا أجيب
- [ ] Autre...

Après la section 21 Passer à la section suivante


Section 22 sur 27

**الأثر النفسي للزلزال**

إن تجربة الزلزال، مثل أي حدث آخر **مفاجئ وغير متوقع**، قد يكون لها **تداعيات نفسية عميقة**، بما في ذلك **الأعراض المرتبطة بالاضطراب النفسي ما بعد الصدمة** . يمكن أن تختلف هذه الأعراض من حيث **شدتها ومدتها** اعتمادًا على عدد من العوامل، مما يؤثر على **التوازن العاطفي والإدراكي والجسدي** للأفراد

**يُرجى قراءة العبارات واختيار الإجابة التي تناسبك أكثر مع أخذ الاعتبار الآتي :** *

**0: لا إطلاقاً**

**1: قليلاً**

**2: بشكل متوسط**

**3: إلى حد كبير**

**4: كثيراً**

Une seule réponse possible par ligne.

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| ذكريات متكررة، ومؤلمة ومزعجة حول تجربة الزلزال؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| احلام متكررة ومزعجة حول تجربة الزلزال؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| فجأة الشعور أو التصرف كما لو أن الزلزال قد حدث مرة أخرى؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| الشعور بالانزعاج، عندما يذكرك شيء بالحادثة؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| الشعور بردود فعل جسدية قوية عندما يذكرك شيء ما بالحدث (تسارع نبضات القلب، صعوبة في التنفس، التعرق)؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| تجنب الذكريات، الافكار، أو الاحاسيس المرتبطة بتجربة الزلزال؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| تجنب الاشياء التي تذكرك بتجربة الزلزال؟، مثال: (الناس، الاماكن، النقاش، النشاطات، الظروف)؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| صعوبة في تذكر أجزاء مهمة من الحادثة؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| وجود شعور سلبي شديد وأفكار حول نفسك أو الاخرين أو العالم (مثال:"أنا سيء ،لدي مشكلة ،لاأحد جدير بالثقة،العالم خطير جدًا"...)؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| إلقاء اللوم عن نفسك أو الاخرين للتجربة أو ما حدث بعدها؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| وجود مشاعر سلبية قوية مثل الخوف، الفزع، الغضب، الذنب، أو الخجل؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| فقدان الاهتمام بالأنشطة التي كنت معتاد على الاستمتاع بها؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| الشعور بالبعد أو الانقطاع عن الآخرين؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| صعوبة في الشعور بالمشاعر الإيجابية ( مثل عدم القدرة على الشعور بالسعادة أو بالحب نحو الناس القريبين منك)؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| سلوك مضطرب، غضب صارخ، تصرفات عدوانية؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| اتخاذ مخاطر غير واعية أو التصرف بطرق قد تعرضك للخطر؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| التوجس والتيقظ؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| الشعور بالإجفال وسرعة التهيج؟ | ☐ | ☐ | ☐ | ☐ | ☐ |
| الصعوبة في التركيز؟ | ☐ | ☐ | ☐ | ☐ | ☐ |

Section 23 sur 27

**الموقف الحالي**

Description (facultative)

* **بالنظر إلى الماضي، ما هو شعورك اليوم عندما تفكر في هذا الحدث؟ 5.1.**

- أشعر بأنني على ما يرام، ولم أشعر بأي تأثير معين.
- ما زلت أشعر بالقلق قليلاً، لكن هذا الشعور خف مع مرور الوقت.
- أعاني من الكوابيس حيث أفكر كثيرًا في الزلزال.
- لا زال لدي خوف دائم من حدوث زلزال آخر.
- أفزع عند أقل صوت أو تحرك مفاجئ.
- أعاني من صعوبات في النوم أو التركيز.
- لا أريد أن أستجيب
- Autre…

* **على مقياس من 1 إلى 10، كيف تشعر اليوم بالقدرة على التعامل مع آثار الزلزال في حياتك اليومية؟ 5.2.**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| غير قادر أبداً | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | قادر بالكامل |

* **هل هناك أي معلومات أخرى تود مشاركتها عن تجربتك مع الزلزال أو عن شعورك اليوم؟ 5.3**

- نعم
- لا

Après la section 23 Passer à la section suivante

**5.4. شارك معنا ما تريد !**

Réponse longue

Après la section 24 Passer à la section suivante

Section 25 sur 27

**ونظراً للطبيعة الموضوعية لتصورات الأفراد حول هذا الحدث، يسعدنا، إذا كنت راغبًا، استكشاف ذلك بمزيد من التفصيل في مقابلة شخصية**

*ستكون هذه المقابلة شخصية بالكامل، ويمكنك إنهاؤها في أي وقت. يمكن إجراء المقابلة وجهاً لوجه أو عن بُعد، حسب تفضيلاتك وتوافرك.*

*

**6.1. هل تريد أن يتم الاتصال بك مرة أخرى لإجراء حوار أكثر تعمقاً حول هذا الموضوع؟**

- نعم
- لا

Après la section 25 Passer à la section suivante

Section 26 sur 27

**يُرجى تقديم معلومات الاتصال الخاصة بك حتى نتمكن من الاتصال بك**

*يمكنك تحديد وسيلة اتصال واحدة فقط إذا لم تكن لديك الوسيلتان معاً. ستبقى بياناتك سرية للغاية*

**Adresse Mail / البريد الإلكتروني**

Réponse longue

**رقم الهاتف / واتساب**

Réponse longue

**الاسم (اختياري)**

Réponse longue

Après la section 26 Passer à la section suivante


Section 27 sur 27
!شكراً لك على وقتك
إن آرائك وخبراتك ذات قيمة كبيرة بالنسبة لنا وتلعب دوراً حاسماً في تحسين فهمنا للأثر النفسي طويل الأمد لهذا النوع من الأحداث
من خلال مشاركتك، تساعدنا في رفع مستوى الوعي بالتحديات التي يواجهها الأفراد والمجتمع
نشكرك على مشاركتك في هذه الدراسة، ونؤكد لك أننا سنضمن لك معاملة هذه المعلومات بأقصى سرية واحترام
الآنسة هبة التهامي - طالبة ماجستير في علم النفس الصحي - Egas Moniz University
catapsy1@gmail.com

## D. Interview Guide

### 1. French Version

***Identification de l'interviewé***

***Vecu du séisme***

- Contexte et réactions immédiates
- Où étiez-vous au moment du séisme ?
- Comment avez-vous réagi sur le moment ? Qu'avez-vous ressenti, pensé ou fait ?
- Étiez-vous seul(e) ou accompagné(e) ? Comment ont réagi les personnes autour de vous ?
- Quelle a été votre première action une fois les secousses terminées ?

***Impact émotionnel et psychologique du séisme***

- Comment vous êtes-vous senti(e) dans les heures et jours qui ont suivi ?
- Avez-vous ressenti de la peur, de l'angoisse, de la tristesse, ou d'autres émotions ?
- Y a-t-il eu des changements dans votre sommeil, votre humeur, votre concentration, votre mode de vie dans les mois qui ont suivi ?
- Quels souvenirs sont les plus marquants pour vous après le séisme ?

***Stratégies d'adaptation***

- Comment avez-vous essayé de faire face à la situation ? Qu'est-ce qui vous a le plus aidé ?
- Avez-vous eu recours à des stratégies personnelles (prière, distraction, action, isolement…) ?
- Avez-vous reçu de l'aide (famille, voisins, associations, professionnels…) ?

- Comment a réagi votre entourage? Avez-vous ressenti de la solidarité?

***Effets à long terme et rétablissement***

- Ressentez-vous encore aujourd'hui des conséquences de cette expérience ?
- Vos réactions ont-elles changé avec le temps ?
- Vous sentez-vous guéri(e) ou en cours de rétablissement ?
- Qu'est-ce qui vous a aidé (ou vous aide encore) à vous en remettre ?

***Sens et réflexions***

- Cette expérience a-t-elle changé votre façon de voir la vie ou vos priorités ?
- Avez-vous tiré des leçons de cet événement ?
- Vos croyances (religieuses, spirituelles, existentielles) ont-elles joué un rôle ?
- Que diriez-vous à une personne qui vivrait une situation similaire?

***Autres éléments***

- Y a-t-il autre chose que vous aimeriez ajouter ou partager ?
- Y a-t-il un aspect que vous aimeriez approfondir ou que nous avons oublié ?

## 2. Arabic Version

**معلومات المشارك**

**تجربة الزلزال**

- أين كنتَ/كنتِ عند حدوث الزلزال؟
- كيف كانت ردة فعلك في تلك اللحظة؟ ماذا شعرتَ، فكّرتَ، أو فعلتَ؟
- هل كنتَ/كنتِ بمفردك أم برفقة أحد؟ كيف كانت ردود فعل من كانوا معك؟
- ما هو أول شيء قمتَ به بعد توقف الهزات؟

**التأثير النفسي والعاطفي**

- كيف شعرتَ في الساعات والأيام التي تلت الزلزال؟
- هل شعرت بالخوف، القلق، الحزن أو مشاعر أخرى؟
- هل حدثت تغييرات في نومك، مزاجك، تركيزك أو أسلوب حياتك؟
- ما هي الذكريات التي بقيت محفورة في ذهنك بعد الزلزال؟

**استراتيجيات التكيّف**

- كيف تعاملتَ مع الوضع؟ ما الذي ساعدك أكثر شيء؟
- هل استخدمتَ استراتيجيات شخصية (الصلاة، الانشغال، العزلة،... إلخ)؟
- هل حصلتَ على دعم من أحد (العائلة، الجيران، الجمعيات، مختصين...)؟
- كيف تفاعل من حولك؟ هل شعرت بروح التضامن؟

**الآثار الطويلة الأمد والتعافي**

- هل لا زلتَ تشعر بتأثيرات هذه التجربة حتى اليوم؟
- هل تغيّرت ردود فعلك مع مرور الوقت؟
- هل تشعر أنك تعافيت، أم أنك ما زلت في مرحلة التعافي؟
- ما الذي ساعدك (أو لا يزال يساعدك) على التحسن؟

**المعنى والتأملات**

- هل غيّرت هذه التجربة نظرتك إلى الحياة أو أولوياتك؟
- هل تعلمتَ شيئاً منها؟
- هل كان لمعتقداتك (الدينية، الروحية...) دور في تجاوزها؟
- ماذا تقول لشخص يمرّ بتجربة مماثلة؟

**عناصر أخرى**

- هل هناك شيء آخر تود إضافته أو مشاركته؟
- هل هناك جانب تشعر أننا لم نتطرّق إليه وتود مناقشته؟

## E. Qualitative Results

***Question 3.1. Comment avez-vous réagi dans l'immédiat lorsque vous avez perçu l'arrivée des secousses ? (Cochez la/les affirmations qui correspondent le mieux à votre situation)***

| Participant | Other Immediate Reaction | English Translation |
|---|---|---|
| 108 | Je suis partie récupère ma mere et mes animaux pour sortir de la maison, par peur de secousses secondaires j'ai rempli la voiture avec nos sacs d'urgences et on a attendu dehors dans la voiture que le tout passe | I went to get my mother and my pets to leave the house; fearing aftershocks, I packed the car with our emergency bags, and we waited outside in the car until everything calmed down. |
| 121 | Je suis d'abord restée figée, puis j'ai réagi à la vue des petits enfants présents avec nous (les mettre à l'abri) | I was initially frozen, then I reacted when I saw the small children with us (to get them to safety). |
| 265 | J'ai fermé la porte à clé | I locked the door. |
| 273 | J'ai cru que c'était un camion | I thought it was a truck. |

***Question 3.2. Quelles stratégies avez-vous adoptées dans le mois qui a suivi l'événement ? (Cochez la/les affirmations qui correspondent le mieux à votre situation)***

| Participant | Other Long Term Strategies | English Translation |
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| 35 | J'ai essayé d'oublier ce qui s'est passé | I tried to forget what happened |
| 59 | Pendant très longtemps j'avais des diarrhées et une grosse peur du bruit | For a very long time I had diarrhea and a strong fear of noise |
| 108 | Forte critique du gouvernement face à son incompétence totale sur le point humain ou infrastructure, 2 ans après des gens n'on toujours pas retrouvé leurs foyers, forte envie d'aller aider | Strong criticism of the government for its total failure in terms of human support or infrastructure; two years later, many still haven't found their homes; I had a strong desire to help |
| 110 | N'ayant rien ressentit j'ai eu peur de ne pas ressentir la prochaine secousse | Since I didn't feel anything, I was afraid I wouldn't feel the next tremor |
| 122 | Réaménagement des chambres afin d'éloigner les gros meubles des lits qui pourraient nous tomber dessus la nuit en cas de séisme | Rearranged the bedrooms to move heavy furniture away from beds in case of another quake |
| 128 | Tous les sons inconnus autour de moi étaient des triggers | All unfamiliar sounds around me were triggers |
| 138 | Vie normale continue | Life went on as usual |
| 147 | Rien, c'était normal. J'ai paniqué la première heure. | Nothing really, it felt normal. I panicked during the first hour. |
| 165 | Beaucoup de tristesse pour les personnes affectées | A lot of sadness for those affected |
| 168 | Je me suis impliquée dans l'aide envoyée aux zones sinistrées | I got involved in delivering aid to the affected areas |
| 174 | Je me suis informé sur la gestion de catastrophe et je me suis déplacée vers l'épicentre pour porter assistance aux sinistrés (vécu comme une obligation) | I educated myself on disaster management and went to the epicenter to assist the victims (felt like a duty) |
| 177 | État normal | Normal state |
| 214 | J'ai accepté la fatalité du moment et des choses qui peuvent se produire dans la vie | I accepted the fate of the moment and the things that can happen in life |
| 223 | Je me suis rendu au Haouz pour être utile | I went to Al Haouz to be helpful |

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| 245 | Rentrer chez moi et aider les personnes touchées par le séisme | Went back home and helped the people affected by the earthquake |
| 261 | Après le premier jour si ce n'est pas les premières heures aucun impact | After the first day, or even just the first few hours, no impact |
| 270 | J'ai été dans les endroits sinistrés le lendemain du séisme | I went to the disaster zones the day after the earthquake |
| 297 | J'ai travaillé avec une organisation pour subvenir au besoin de nourriture dans toute la région de El Haouz | I worked with an organization to provide food aid across the entire El Haouz region |
| 311 | تركت المصباح مضيئا ثم راقبت حركاته فلم اشعر الا و قد نمت | I left the lamp on and kept watching it shake until I eventually fell asleep |
| 312 | من المهم توضيح أنه بالنسبة لي ولزوجتي ولكثير ممن أعرفهم … لم يكن توجهنا للتمسك والالتزام أكثر بالصلاة وصلة الأرحام والدين عموما، لم يكن ذلك من أجل أن يساعدنا ذلك على تجاوز صدمة الزلزال … ولكم كان رجوعنا للتمسك بالصلاة والدين والأهل ناتجا عن كون الزلزال أعاد ضبط بوصلتنا وذكرنا بالأهم في هذه الحياة وبما يجب أن نجعله فعلا أولوية لنا قبل أن يدركنا الموت ونحن في غفلة ولم نكن قد أنجزنا كل ما كنا نحب أن ننجزه خصوصا في علاقاتنا مع الله ومع الأقارب، ولا نضيع أعمارنا في الإسراف باللهو والمُتَع وملاحقة طموحات مادية أو مهنية لا قيمة حقيقية لها بالمقاييس الكبرى | It is important to clarify that for me, my wife, and many others I know… our return to prayer, family bonds, and religion was not simply a way to cope with the earthquake trauma. Rather, it realigned our compass and reminded us of what truly matters in life—what should be our priority before death finds us while we're distracted, having not accomplished what really matters, especially in our relationships with God and loved ones. We shouldn't waste our lives chasing distractions, pleasures, or empty material or professional ambitions. |
| 319 | Autant que rotarienne : on s'est déplacé vers le lieu, on a su quand même faire notre mieux pour aider une partie de cette région annoncée dans votre recherche et celle que l'entoure | As a Rotarian, we went to the location, and we managed to do our best to help part of the area mentioned in your research and its surroundings |
| 332 | Aucune | None |
| 334 | احساس محايد و عادي | A neutral and ordinary feeling |
| 336 | فكرت في المصابين الذين تشردوا وحاولت العمل على مساعتهم | I thought of those who were displaced and tried to help them |

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| 346 | j'ai plus pensé aux gens plus proches de la catastrophe et j'ai appelé la famille pour s'assurer que rien de grave ne s'est arrivé | I mostly thought of those closer to the disaster and called family to make sure nothing serious had happened |

### *Question 5.3. Y a-t-il autre chose que vous souhaiteriez partager sur votre expérience du séisme ou sur la manière dont vous vous sentez aujourd'hui ?*

| Participant | Post Quake Development | English Translation |
|---|---|---|
| 53 | بنتي مزال متأثرة بشكل كبير وتخاف حتى من صوت جرس الباب تضع يديها على اذنيها وتصرخ من الخوف كلما دق جرس الباب | "My daughter is still deeply affected and is afraid even of the doorbell. She covers her ears and screams in fear every time it rings." |
| 59 | Je pense que je ne supporterai pas de vivre une deuxième fois cet évènement très douloureux. | "I don't think I could endure going through such a painful event again." |
| 82 | Je me sens un peu plus forte face aux difficultés | "I feel a bit stronger when facing difficulties now." |
| 106 | J'ai bien réagi pendant la secousse et j'ai tout de suite cherché à me protéger et protéger ma famille . On a un peu rigolé mais après des mois je suis restée traumatisée car je ressentais toutes les secousses suivants le séisme même pendant mon sommeil. Mon corps était en alerte , j'ai eu des vertiges de l'oreille interne et je suis sur que c'était des symptômes post traumatiques. | "I reacted well during the tremor and immediately tried to protect myself and my family. We even laughed a little, but months later I remained traumatized because I kept feeling aftershocks, even during sleep. My body was on alert; I had inner ear dizziness and I'm sure these were post-traumatic symptoms." |
| 108 | Il est essentiel de s'interroger sur la manière dont notre gouvernement s'est organisé pour protéger et soutenir sa population. Dans bien des cas, des initiatives humanitaires improvisées se sont révélées plus efficaces. Pendant cette période, de nombreux enfants ont été victimes de crimes pédocriminels, et les arnaques se sont multipliées. Deux ans plus tard, les séquelles sont toujours visibles, tant dans les zones rurales qu'urbaines, sans réelle prise en charge de l'État. La priorité donnée à l'image du gouvernement, au détriment du bien-être de son peuple, s'est manifestée de façon flagrante. | "It is essential to question how our government organized itself to protect and support its people. In many cases, improvised humanitarian initiatives proved more effective. During this time, many children were victims of abuse, and scams multiplied. Two years later, the consequences are still visible in both rural and urban areas, with no real state support. The government's image was prioritized over the well-being of its people, and this was obvious." |
| 109 | Je trouve que l'experience du seisme a reclarifié au monde que les choses et les plaisirs matériels ne sont qu'éphémères et que l'experience du | "I believe the earthquake reminded the world that material things and pleasures are ephemeral, and that we must restore the values |

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| | seisme nous a remontrée que nous devons reinstaurer les valeurs et les principes que nous avions autrefois ; l'entre aide, l'inconsideration des classes sociales et le jugement qui y suit. Finalement, tout peut etre perdu en une seconde, donc il faudrait faire de chaque seconde de sa vie, une seconde de non regrets et preuve de bonté. | we once had: mutual aid, disregard for social class, and non-judgment. Everything can be lost in one second, so every second of life should be lived without regret and with kindness." |
| 127 | 5-10 min après le séisme, j'ai eu des symptômes physiques (vomissements, diarrhée), mais après la première nuit tout est revenu à la normale | "5–10 minutes after the earthquake, I had physical symptoms (vomiting, diarrhea), but after the first night, everything returned to normal." |
| 139 | J'ai eu honte au début d'avoir instinctivement cherché à me mettre à l'abri avant d'être allé aider les autres | "At first I was ashamed that I instinctively sought shelter before going to help others." |
| 141 | Le séisme n'a pas laissé de séquelles psychologiques lourdes en moi. J'ai réussi à passer outre assez rapidement. Dans les jours/mois qui suivent, en étant toujours dans le même ville où j'ai vécu le séisme d'Al-Haouz, c'était difficile de passer rapidement à autres choses, car les dégâts matériels étaient visibles dans les rues, et tout le monde en parlait à la radio et à la télé, autour de moi. La tristesse pour la situation générale était inévitable. Aujourd'hui cela reste un souvenir dont je me souviens très bien. Le moment du tremblement, bien que bref, était fort en émotions, mes muscles sont restés contractés pendant toute la soirée suite à la peur ressentie. J'étais au rez-de-chaussée, dans un restaurant sur une chaise haute au moment du séisme, quelques secondes se sont écoulés avant de comprendre ce qu'il se passait. Ma chaise tremblait et j'ai réalisé après quelques secondes qu'il s'agissait d'un séisme, et j'ai suivi le mouvement de foule qui allait vers la sortie. Des verres sont tombés par terre. Je pense que le ressenti en étages plus hauts a dû être plus intense, accompagné d'une peur de ne pas être proche de l'extérieur. Aujourd'hui, les séquelles psychologiques sont sous forme de souvenirs qui ressurgissent lorsque ma chaise tremble quand quelqu'un agite son pied sur une chaise voisine, et qui fait trembler la mienne. En général, lorsque je sens ma chaise trembler, je me remémore ce qui s'est passé pendant le séisme, accompagné d'une légère peur que cela ne se reproduise. Je pense que cela est un indice qui me permettra de discerner un séisme dans le futur! | "The earthquake didn't leave serious psychological marks on me. I was able to move on fairly quickly. However, in the following days/months, still living in the city where the Al Haouz earthquake occurred, it was hard to move on because the material damage was visible, and everyone talked about it on the radio, TV, and around me. The sadness was unavoidable. Today, I remember it very clearly. Although brief, the moment of the tremor was intense, and my muscles remained tense all evening. I was on the ground floor, in a restaurant on a high stool. A few seconds passed before I understood what was happening. My chair shook and I realized it was an earthquake. I followed the crowd to the exit. Glasses fell to the floor. I think those on higher floors felt it more intensely and feared not being near an exit. Today, the psychological effects come back as memories when my chair shakes, even from someone tapping nearby. It triggers a mild fear that it might happen again. I think it's something that will help me recognize an earthquake in the future!" |
| 150 | J'étais fière de la solidarité des marocains entre eux | "I was proud of the solidarity among Moroccans." |

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| 160 | مررت بتجارب زلزالية عديدة في اسيا واصبحت أتعامل معها طبيعيا وبهدوء | “I’ve lived through many earthquakes in Asia and have learned to respond to them calmly and naturally.” |
| 162 | C’était une mauvaise expérience: je pense que Dieu nous a épargné et que la vie est trop fragile | “It was a bad experience. I believe God spared us and that life is extremely fragile.” |
| 166 | Ma fille de 9 ans a très mal vécu l’expérience. Elle faisait souvent des cauchemars et avait peur de nous perdre. Elle me demandait toujours de rester avec elle au lit.<br>Elle a suivi quelques séances chez un pédopsychiatre, et maintenant elle se sent mieux. | “My 9-year-old daughter had a very hard time. She often had nightmares and was afraid of losing us. She constantly asked me to stay in bed with her. She had a few sessions with a child psychiatrist, and now she feels better.” |
| 196 | Je tiens à construire dans un futur proche une maison équipé contre toutes sortes de séisme. | “I plan to build a house in the near future that is equipped against all kinds of earthquakes.” |
| 201 | Développer des cellules d écoute en psychologie pour les citoyens en zone à risque sismique afin d optimiser leur réaction au moment et en poste séisme | “Develop psychological listening centers in seismic risk zones to help optimize reactions during and after an earthquake.” |
| 202 | Pour gerer la situation il faut y penser bien avant et se préparer mentalement et s’yattendre à tout moment comme ca le stress au cours du séisme sera moins important. | “To manage the situation, you have to prepare mentally in advance and expect it at any moment so the stress is lower during the earthquake.” |
| 223 | Le séisme d’Al Haouz a perturbé notre vie quotidienne durant une longue durée ainsi que le moindre bruit me fait peur ! | “The Al Haouz earthquake disrupted our daily life for a long time. Even the slightest noise scares me!” |
| 225 | *Prodiguer des formations sur la manière d'agir pendant les catastrophes naturelles<br>*accompagnement pendant les premiers jours après le séisme<br>* soutien psychique après le séisme | “Provide training on how to act during natural disasters, support during the first days after an earthquake, and psychological support afterward.” |
| 229 | La vie est belle et quand on aime on hésite pas | “Life is beautiful, and when you love, you don’t hesitate.” |
| 240 | Je me suis occupée à reconstruire les parties détruites de la maison. Cela m'a aidé à ne pas trop penser aux difficultés tout en pensant qu'il y a des personnes qui sont dans des situations pires, des gens qui ont perdu la vie | “I kept busy rebuilding the damaged parts of my home. It helped me not dwell too much on the hardship, and I reminded myself that others were worse off, some lost their lives.” |
| 241 | J'étais bénévole en tant que secouriste lors du séisme al haouz c'était un honneur de travailler | “I volunteered as a first-aid responder during the Al Haouz earthquake. It was an honor to |

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| | auprès de ces gens de les faire comprendre ce que le séisme aussi de les soigner soulager un peu leur peur et choc juste un point c'est très décevant que le gouvernement a tardé le sauvetage et le suivi psychologique cette population pire encore les soins vétérinaires dans quelques régions al haouz | work with these people, help them understand the earthquake, treat them, and ease their fear and shock. However, I was deeply disappointed by the government's delay in rescue efforts and psychological support, and even more so by the lack of veterinary care in some areas." |
| 242 | J espère pour ceux qui ont été affectés par cette catastrophe de trouvé leur vie normale et un bon rétablissement et que dieu ait mesirecorde pour ceux qui ont perdus la vie dans cette catastrophe.. | "I hope those affected by this disaster recover and find normal life again, and may God have mercy on those who died." |
| 256 | زلزال الحوزة إبان عن اللحمة التي توحد المغاربة عند الشدة والمبادرة التي قام بها عامة الشعب كانت ملحمة في حد ذاتها مع تخلف الحكومة عن الموعد | "The Al Haouz earthquake revealed the unity of Moroccans in times of hardship. The people's initiatives were heroic, especially compared to the government's delay." |
| 257 | الحمد لله على لطف الله | "Praise be to God for His mercy." |
| 264 | Je fais toujours ma prière avant de coucher | "I always say my prayers before going to bed." |
| 270 | Aider les gens avec le moindre des choses la vie n a pas de valeur nous sommes rien dans ce monde.... | "Help people with whatever you can. Life has no value, we are nothing in this world." |
| 284 | زلزال الحوز ليس التجربة الاولى. فقد سبقتها تجارب سابقة 3 او 4 على ما اذكر بمدينة اكادير. الاولى خلال السبعينات من القرن الماضي والثانية والثالثة خلال الثمانينات و التسعينات. كنت تلميذا بثانويتي ولي العهد ثم بثانوية يوسف بن تاشفين والمرة الثالثة كنا في المسجد خلال صلاة الجمعة. | "The Al Haouz earthquake wasn't my first experience. I lived through three or four in Agadir, one in the 1970s and others in the 1980s and 1990s. I was a student back then. During the third one, I was in the mosque for Friday prayers." |
| 288 | Je me suis libere de tout lien | "I have freed myself from all attachments." |
| 290 | Après le séisme précédent j'ai vécu un autre séisme dernièrement avec une intensité bien plus faible mais cette fois en étant loin de ma famille . Ma réaction était la plus excessive de tous : crise d'angoisse, peur , pleur , difficultés à respirer... Encore aujourd'hui je suis en panique totale à tel point que je ressens les moindres vibrations réels soit-elle ou imaginaire . Ça me hante encore aujourd'hui ... | "After the previous earthquake, I experienced another minor one recently while away from my family. My reaction was extreme: panic attack, fear, crying, difficulty breathing. Even now, I panic at the slightest vibration, real or imagined. It still haunts me today." |
| 306 | ايماني بالقضاء و القدر خفف من مخاوفي و توتري | "My faith in fate and divine will eased my fear and anxiety." |
| 311 | تجربة توقظ فيك الإحساس بالأولويات وتحفز على اغتنام ما تقدمه الحياة من فرص لا تعوض ليجعل من نفسه شخصا أفضل ولينفع الآخرين ويترك أثرا طيبا من الخير ما استطاع ... الحمد لله على كل حال ... قد يأسف المرأ حين يلاحظ أن هذه العزيمة قد تخبو وتتناقص مع مرور الوقت ليعود الإنسان إلى كثير من عاداته السيئة إلا إذا كان قد شرع في اتخاذ خطوات عملية حقيقية (وإن صغيرة او قليلة لكن وستمرة | "It's an experience that awakens your sense of priorities and encourages you to seize life's irreplaceable opportunities, to become a better person, benefit others, and leave a trace of goodness. Praise be to God in all circumstances. One may regret that this determination fades with time unless one |

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| | ومستدامة) لكي يحافظ على همة العالية ويَثبُت على الطريق القويم الذي يرضاه لنفسه | commits to small but sustainable changes to stay on the right path.” |
| 316 | يجب ان نستشعر ان مثل هذه الأحداث ممكن ان تقع في كل وقت وحين. وعلينا دائما أن نستحضر قوة الخالق واننا لا نسأل رد القضاء ولكن نساله سبحانه وتعالى اللطف فيه. | “We must realize that such events can occur at any time. We should always remember the Creator’s power. We cannot ask to avoid fate, but we can ask God for gentleness in how it unfolds.” |
| 333 | انتقاد الطريقة التي تعاملت بها الدولة مع تسيير الفاجعة | “Criticism of how the state managed the disaster response.” |
| 335 | آثار الزلزال ما تزال تؤثر على الناس وعلى مناطق واسعة في المدينة والبادية على السواء والمتضررون لا يستطيعون إعادة بناء مساكنهم لا يسمح لهم بذلك ولا يتلقون المساعدات الموعود بها وصعوبة الحصول على التصاميم. باختصار مشاكل كثيرة ما زالت مطروحة | “The effects of the earthquake are still impacting people across both urban and rural areas. Many victims still cannot rebuild or receive promised aid. In short, many issues remain unresolved.” |
| 344 | هذا الزلزال غير فينا الكثير | “This earthquake changed many things in us.” |
| 345 | en fait c'est la réaction des gens autour de nous et son impact sur sois meme , pour moi j 'étais dans un lieu d'estivage et dans le meme bâtiment une femme enceinte avec un enfant en bas âge et son mari , la femme n 'était pas du tout bien surtout elle est de la région d'agadir et surement à des souvenirs douloureux du grand seisme d'agadir . | “Actually, it’s the way people around us reacted that left an impact. I was in a vacation building with a pregnant woman, her baby, and husband. The woman wasn’t well she’s from Agadir and must have painful memories from the big earthquake there.” |
| 350 | الكثير من المعلومات التي تساعد على مواجهة مثل هذه المواقف بافضل صورة | “A lot of information is needed to help people face such events in the best way possible.” |

# F. Proposta de Tese

## Proposta de Tese

### Dados do Aluno

| | | | |
|---|---|---|---|
| Nome do proponente | **Hiba Touhami** | | |
| Nº do Aluno | 118339 | Data do pedido | 06/03/2025 |
| Email do Aluno | 118339@alunos.egasmoniz.edu.pt | | |
| Nº do telemóvel | 0033623288448 | Nome do Curso | MPCS |
| Unidade Orgânica | IUEM | CNAEF | 311 (Psicologia) |

### Dados da Tese

Ano letivo de defesa da tese 2024/2025

Título da tese (PT) Terremoto de Al Haouz (Morocco, 2023): Análise do impacto psicológico de longo prazo e estratégias de Coping entre os residentes da região de acordo com seu ambiente e experiência.

Título da tese (EN) Al Haouz earthquake (Morocco, 2023): Analysis of the long-term psychological impact and coping strategies among residents of the region according to their environment and experience.

Resumo da tese

Natural disasters, such as earthquakes, can have a profound impact on affected individuals and communities. These unpredictable and often destructive events trigger a series of psychological reactions that can be long-term and influence everyone's own cope strategies. Among the disorders frequently observed following a major trauma such as this one is post-traumatic stress disorder (PTSD), a pathology known for its long-term effects on mental health. In addition, the traumatic experience of a natural disaster such as this one can also have a lasting effect on their psychological well-being and impact their quality of life in the long term.

The earthquake of September 8, 2023, which hit the Al Haouz region of Morocco, marked one of the worst natural disasters in the country's recent history. With a magnitude of 6.8 on the Richter scale, it caused thousands of deaths and injuries, and destroyed a large number of homes and infrastructure in the region, especially in disadvantaged areas located in the city of Marrakech or in the Great Atlas Mountains. According to recent data from UNICEF (2023), the number of victims amounts to 3,000 deaths, not counting the innumerable material damage that has impacted the country's economy. The immediate intervention of local, national and international aid but also of the populations to help the most disadvantaged, made it possible to manage emergencies, but the consequences left by this disaster, especially from a psychological point of view, remain to be examined. Thus, the long-term psychological consequences of such an event deserve special attention, especially in some disadvantaged environments where mental health is left in the background, whether because of a lack of accessible resources or simply the underestimation of its importance.

This research has several interests. Initially, it will help to enrich the literature on PTSD and the coping strategies used in the context of natural disasters, especially in a developing country like Morocco, where psychological resources are sometimes uneven or even limited in certain areas. It will also highlight disparities between settings, as well as cultural and social specificities in responses to trauma, by studying defense mechanisms, coping strategies and resources that have facilitated resilience (e.g. social support, religious faith, community engagement). Because indeed, apart from the intensity of the symptoms of PTSD and the coping strategies adopted, several other factors can also come into play. Such as, for example, the living environment, the lived experience, the type of losses suffered, sex, age, cognitive resources or socio-economic status. It would therefore be essential to evaluate these elements more closely in order to acquire a more in-depth understanding of the psychological impact suffered by individuals. Finally, by identifying the differences in response to trauma according to socio-economic environments, this research could encourage a better understanding of needs and thus a better distribution of resources in often neglected rural areas, by setting up psychological support services accessible on a regular basis.

Metodologias

1. Problem and research questions:

## Proposta de Tese

How did the earthquake of September 8 2023 influence the onset and evolution of symptoms of post-traumatic stress disorder (PTSD) in the population of AL Haouz region, and what differences can be observed according to sex, age, living environment, losses suffered and the coping strategies used?

⇒ Which populations are most psychologically vulnerable to the development of long-term PTSD symptoms?

⇒ What are the risk factors associated with the development of PTSD after the earthquake?

⇒ Which populations are most psychologically vulnerable to the development of long-term PTSD symptoms?

⇒ What are the dominant coping strategies and what are the factors influencing them?

2. Population:

The population studied will be composed of adults (18 years and over) who lived through the earthquake of September 8, 2023, whether they live in urban areas (Marrakech) or in rural areas (mountainous regions of Al Haouz).

A total sample of about 500 participants will be targeted, divided between urban and rural areas to ensure sufficient representativeness. A stratification according to age, sex, and socio-economic level will be carried out in order to have relevant subgroups for the analysis.

3. Procedure:

The study will be conducted according to an explanatory sequential plan with a quantitative part followed by a qualitative part. Initially, a snowball sampling will be used to collect quantitative data using online questionnaires with demographic data, the place of life, the experience of the event and the coping strategies used by individuals but also with a scale assessing the level of post-traumatic stress (PTSD). Subsequently, a convenience sample will be applied to select the people who responded favorably in order to conduct more in-depth interviews. Finally, a trial sample will be carried out in order to obtain about 25 participants for these interviews. These participants will be chosen based on their specific characteristics deemed relevant and previously collected data such as losses suffered, post-traumatic stress level or coping strategies.

Data collection will be done mainly online, but will be possible in person according to the needs and availability of the participants. In rural areas, where a large part of the population does not have access to the Internet and may have reading and comprehension difficulties, field teams will be mobilized to administer the questionnaires in person. This will collect more accurate information and avoid any bias of understanding. A partnership with local associations could thus facilitate access to these populations and allow more significant results. In urban areas, especially in Marrakech and in the suburbs, the collection will be done mainly online, thus allowing rapid and expanded access to the target population.

3.1. Quantitative data

The quantitative phase involves the transmission of standardized questionnaires to assess the symptoms of PTSD and other associated variables such as coping strategies, the participant's experience and perceived social support. The questionnaires will be administered in person or online, depending on the location and availability of the participants.

Online questionnaire requesting socio-demographic data, including variables such as age, sex, living environment, socio-economic status, level of education and losses suffered (human and material) and the experience of the experience. The latter will include scales evaluating the PTSD (PCL-5) and the Coping (Brief COPE).

The PTSD Checklist for DSM-5 (PCL-5): Weathers, F.W., Litz, B.T., Keane, T.M., Palmieri, P.A., Marx, B.P., & Schnurr, P.P. (2013). The PTSD Checklist for DSM-5 (PCL-5). Scale available from the National Center for PTSD at www.ptsd.va.gov.

Carver, C. S. (1997) You want to measure coping but your protocol is too long: Consider the brief cope. International journal of behavioral medicine, 4(1), 92-100.

3.2. Qualitative data

The qualitative phase will complement the quantitative data through semi-directive interviews. This will allow in-depth exploration of the victims' subjective experiences, their perception of the earthquake, and the strategies they have put in place to cope with the trauma. A sample of 25 participants will be selected for in-depth individual interviews. These participants will be chosen to represent a variety of profiles, including different ages, genders, places of residence, types of losses suffered and professions (doctors, rescuers, construction workers, members of associations, psychologists, pharmacists, engineers, community leaders, journalists, residents, police officers, etc.). These interviews will focus more deeply on the experience of the event, the psychological symptoms observed after the earthquake, and the perceived support. They will also include open questions to allow a deeper and more subjective look at the situation.

4. Data analysis

4.1 Quantitative data

Analysis of descriptive statistics to summarize the main characteristics of each type of population (level of PTSD, distribution of coping strategies).

Multivariate regression analyses to examine the relative influence of each variable on the development of PTSD and on the type of coping adopted by the person.

Comparison of groups to identify significant differences between groups (urban vs rural, men vs women, socio-economic status...)

4.2 Qualitative data

The interviews and focus groups will be transcribed and then analyzed using a thematic analysis. The answers will be coded according to the most emerging themes (types of coping, experience in the face of the situation, perceived social support, perceptions of PTSD symptoms).

Palavras-Chave Earthquake, Post-traumatic stress disorder, Coping, living environment, resilience, vulnerability, Morocco, Al-Haouz, Social disparities

Bibliografia

Aldrich, D. P. (2012). Building resilience: Social capital in post-disaster recovery. University of Chicago Press. https://www.researchgate.net/publication/245024251_Building_Resilience_Social_Capital_in_Post-Disaster_Recovery

AlloDocteurs Africa. (2023). Séisme au Maroc : la difficile prise en charge des blessures mentales. AlloDocteurs Africa. https://www.allodocteurs.africa/seisme-au-maroc-la-difficile-prise-en-charge-des-blessures-mentales-8233.html

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). American Psychiatric Publishing.

Baumann, M., & Teasdale, T. W. (2018). Mental health and vulnerability: Addressing disparities in disaster response.

Brooks, R., et al. (2017). Long-term psychological outcomes of natural disasters: A systematic review and meta-analysis. Journal of Affective Disorders, 220, 97-105.

Bryant, R. A., et al. (2011). The DSM-5 acute stress disorder diagnosis and posttraumatic stress disorder. Psychological Medicine, 41(10), 2141-2150.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. International Journal of Behavioral Medicine, 4, 92-100.

Carr, V. J., Lewin, T. J., Kenardy, J. A., Webster, R. A., Hazell, P. L., Carter, G. L., & Williamson, M. (1995). Psychological sequelae of the 1989 Newcastle earthquake: III. Role of vulnerability factors in post-disaster

morbidity. Psychological Medicine, 27(1), 179-190.

Carr, V. J., Lewin, T. J., Webster, R. A., Hazell, P. L., Kenardy, J. A., & Carter, G. L. (1997). Psychological sequelae of the 1989 Newcastle earthquake: I. Community disaster experiences and psychological morbidity 6 months post-disaster. Psychological Medicine, 27(1), 167-178.

Carmassi, C., et al. (2014). Post-traumatic stress disorder in the L'Aquila 2009 earthquake survivors: A follow-up study. Journal of Affective Disorders, 149(1-3), 320-326.

Cavallo, E., & Noy, I. (2011). The economics of natural disasters: A survey. International Review of Environmental and Resource Economics, 5(1), 63-102.

Foa, E. B., & Rothbaum, B. O. (1998). Treating the trauma of rape: Cognitive-behavioral therapy for PTSD. Guilford Press.

Foa, E. B., Keane, T. M., Friedman, M. J., & Cohen, J. A. (2009). Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies. Guilford Press.

Foa, E. B., et al. (2019). Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies. Guilford Press.

Goenjian, A. K., et al. (2001). Posttraumatic stress and depressive reactions among Nicaraguan adolescents after Hurricane Mitch. American Journal of Psychiatry, 158(5), 788-794.

International Federation of Red Cross and Red Crescent Societies (IFRC). (2023). Response to Al Haouz earthquake.

International Labour Organization (ILO). (2011). Pakistan floods 2010: Recovery and reconstruction needs assessment. https://www.ilo.org/publications/pakistan-floods-2022-post-disaster-needs-assessment-supplemental-report

Kessler, R. C., et al. (2017). Trauma and PTSD in the WHO World Mental Health Surveys. European Journal of Psychotraumatology, 8(5), 1353383.

Marmar, C. R., Weiss, D. S., Metzler, T. J., & Delucchi, K. L. (1996). Longitudinal course and predictors of continuing distress following critical incident exposure in emergency services personnel. Journal of Nervous and Mental Disease, 184(6), 408-414.

Médecins du Monde. (2023). Séisme au Maroc : Le soutien psychologique aux victimes est indispensable dès maintenant. Médecins du Monde. https://medecinsdumonde.ch/news/seisme-au-maroc-le-soutien-psychologique-aux-victimes-est-indispensable-des-maintenant/

Medi1TV. (2023, September 13). Séisme d'Al Haouz: un travail extraordinaire des forces de l'ordre. Medi1TV. https://medi1tv.com/fr/episode/89628/Séisme-d-Al-Haouz--un-travail-extraordinaire-des-forces-de-l-ordre

Medi1News. (2023, September 12). Séisme au Maroc : Les initiatives solidaires se multiplient pour venir en aide aux sinistrés. Medi1News. https://www.medi1news.com/fr/article/293278.html

Medi1News. (2023). Séisme : Quel suivi psychologique des sinistrés ? Medi1News. https://medi1news.com/fr/article/295475.html

Münich, R. E. (2013). Haiti earthquake 2010: The long-term economic and psychological impact. Journal of Disaster Research, 8(4), 500-512.

Neria, Y., Nandi, A., & Galea, S. (2008). Post-traumatic stress disorder following disasters: A systematic review. Psychological Medicine, 38(4), 467-480.

Neria, Y., et al. (2010). Post-traumatic stress disorder following disasters: A systematic review. Psychological Medicine, 40(10), 345-367.

Neria, Y., et al. (2018). Trauma and mental health in the context of natural disasters.

Norris, F. H., et al. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. Psychiatry, 65(3), 207-239.

Outaleb, A. (2023). Psychological responses to the Al Haouz earthquake: Challenges and interventions.

Shinfuku, N. (2012). Disaster mental health: Lessons learned from the Great East Japan Earthquake.

United Nations International Children's Emergency Fund (UNICEF). (2023). Morocco earthquake situation report.

United Nations News (UN News). (2023). Solidarity and resilience in Morocco after the earthquake.

World Health Organization (WHO). (2013). Building resilience: A key to disaster prevention and recovery.

Zhang, Z., et al. (2015). Longitudinal trajectories of posttraumatic stress disorder symptoms among adolescents after the Wenchuan earthquake in China. Journal of Traumatic Stress, 28(3), 272-279.

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment, 52(1), 30-41. https://doi.org/10.1207/s15327752jpa5201_2

Local de Realização do Estudo Online Questionnaire for Moroccan Population of Al Haouz Region (Morocco)

Objetivo de trabalho

Research into the psychological impact of natural disasters has intensified in recent decades. However, each event has its own cultural, geographical and socio-economic specificities, making a localized, in-depth analysis crucial. The earthquake of September 8, 2023, which struck the Al Haouz region of Morocco, caused significant human and material losses, eliciting not only subjective resilience responses but also a heavy emotional impact. It also affected individuals differently, depending on their age, sex, place of residence, socio-economic situation and the direct or indirect losses suffered.
To date, there are few scientific studies analyzing the long-term psychological impact of this event on victims. This study therefore aims to understand the mechanisms by which post-traumatic stress disorder (PTSD) develops in this particular context,
while analyzing the differences in the experience of and response to trauma, including coping strategies as a function of several individual and collective variables.

# Proposta de Tese

Alinhamento estratégico da tese

N/A

Transferência de conhecimento pra sociedade

N/A

## Dados da Instituição

Dados da Instituição **Egas Moniz**

## Tipo de Trabalho

Tipo de investigação **Primária** Investigação primária **Aplicada**

Metodologia de investigação **Mista**

Desenho estudo **Descritivo**

Grupo de investigação **Não Aplicável**

Enquadramento nos ODS

☑ 3. Saúde de qualidade

☑ 4. Educação de qualidade

## Comissão de Ética

O trabalho submetido nesta proposta requer aprovação pela Comissão de Ética? **Sim**

## Projeto Científico

Dissertação / Investigação Associada a Projeto Científico? **Não**

## Clinica Dentária

Necessita de utilizar a clínica dentária Egas Moniz? **Não**

Necessita de utilizar o banco de dentes? **Não**

## Clínica Fisioterapia

Necessita de utilizar a clínica fisioterapia Egas Moniz? **Não**

Necessita de consultar os registos clínicos? **Não**

# Proposta de Tese

## Clínica Almada

Necessita de utilizar a clínica Almada? Não

Necessita de consultar os registos clínicos? Não

## Laboratórios Egas Moniz

O trabalho requer utilização de Laboratórios Internos? Não

## Cronograma

| | | | | | |
|---|---|---|---|---|---|
| 1- | Atividade: | Bibliographical Research | Mês: | Setembro | Ano: 2024 |
| 2- | Atividade: | Bibliographical Research | Mês: | Outubro | Ano: 2024 |
| 3- | Atividade: | Preparation of the Project Proposal | Mês: | Setembro | Ano: 2024 |
| 4- | Atividade: | Preparation of the Project Proposal | Mês: | Outubro | Ano: 2024 |
| 5- | Atividade: | Project Proposal input | Mês: | Outubro | Ano: 2024 |
| 6- | Atividade: | Narrative revision of Literature | Mês: | Outubro | Ano: 2024 |
| 7- | Atividade: | Narrative revision of Literature | Mês: | Novembro | Ano: 2024 |
| 8- | Atividade: | Narrative revision of Literature | Mês: | Dezembro | Ano: 2024 |
| 9- | Atividade: | Drawing up the Intervention Protocol (Questionnaire) | Mês: | Novembro | Ano: 2024 |
| 10- | Atividade: | Drawing up the Intervention Protocol (Questionnaire) | Mês: | Dezembro | Ano: 2024 |
| 11- | Atividade: | Submission of the First Report | Mês: | Dezembro | Ano: 2024 |
| 12- | Atividade: | Application of the Online Questionnaire with Collection of Answers | Mês: | Dezembro | Ano: 2024 |
| 13- | Atividade: | Application of the Online Questionnaire with Collection of Answers | Mês: | Janeiro | Ano: 2025 |
| 14- | Atividade: | Application of the Online Questionnaire with Collection of Answers | Mês: | Fevereiro | Ano: 2025 |
| 15- | Atividade: | Statistical Analysis | Mês: | Março | Ano: 2025 |
| 16- | Atividade: | Statistical Analysis | Mês: | Abril | Ano: 2025 |

## Proposta de Tese

| | | | | |
|---|---|---|---|---|
| 17- | Atividade: Submission of the second report | Mês: Março | Ano: 2025 |
| 18- | Atividade: Elaboration of results | Mês: Abril | Ano: 2025 |
| 19- | Atividade: Elaboration of results | Mês: Maio | Ano: 2025 |
| 20- | Atividade: Elaboration of the discussion and conclusion | Mês: Maio | Ano: 2025 |
| 21- | Atividade: Elaboration of the discussion and conclusion | Mês: Junho | Ano: 2025 |
| 22- | Atividade: Submission to scientific committee | Mês: Julho | Ano: 2025 |
| 23- | Atividade: Dissertation submission | Mês: Julho | Ano: 2025 |
| 24- | Atividade: Estimated date of completion | Mês: Julho | Ano: 2025 |

### Financiamento

Custos Não Estimativa de Custos 0,00€ Fonte de Financiamento? Não

### Dados dos Orientadores

Orientador Marta Sofia Reis

Nº de Co-orientadores 0

☐ Tem co-orientador externo

### Parecer Orientação

Lista de pareceres dos Orientadores

| | Tipo de parecer | Orientador | Data | Atual | Estado |
|---|---|---|---|---|---|
| 1- | Orientador | Marta Sofia Reis | 21/10/2024 | Sim | Parecer positivo |

### PC

Aprovado por José Grillo Data 28/10/2024

Proposta aprovada? Sim

# Proposta de Tese

## Comissão de Ética

Aprovado por Filipa Vicente Data 06/03/2025

Proposta aprovada? Sim