From Poisoned Skies to Present Struggles: The Long Shadow of Chemical Genocide in Halabja

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Abstract

Background and objectives:

The chemical bombardment of Halabja in 1988 cast a trans-generational shadow that spans death. The present study compares historical victim testimonies with biomedical and environmental research to highlight interconnected health, environmental, social and political impacts and find practical lapses in treatment, restoration and awareness.

Methods: Using Van Manen's hermeneutic phenomenology, we conducted purposive, semi-structured interviews with 12 survivors of 1988 Halabja chemical genocide and the victims' relatives from June to August 2025. Interviews (60–80 minutes) were recorded, transcribed, translated, and thematically analyzed via Van Manen's six activities.

Results: Data analysis led to the emergence of five themes: (1) lasting humanitarian and health consequences; (2) displacement and social fragmentation; (3) environmental damage and contamination; (4) psychosocial trauma and community recovery; and (5) political and global dimensions of chemical genocide.

Conclusion: Recovery remains non-linear and incomplete. Comprehensive solutions to a protracted response include sustainable clinical care, open environmental surveillance, psychosocially consistent care, and commemoration and redress in consonance with international agreements.

Keywords: Halabja; chemical genocide; sulfur mustard; hermeneutic phenomenology; environmental contamination; psychosocial trauma

Introduction

The chemical bombardment of Halabja in 1988 can be referred to as a classic example of mass atrocity with a far-reaching impact that goes beyond what is immediately understood by the death toll. The event has left a legacy that is seen in long-term disease effects, disrupted community life and incomplete processes of recognition and remediation as old survivors get older and new generations mature (Balali-Mood & Balali-Mood, 2015). With resting on the evidence of the interdisciplinary literature, this paper focuses on five interconnected areas: dead end humanitarian and health impacts; the displacement and social fragmentation; environmental destruction;

psychosocial trauma and healing; and the politics/ international levels that have marked Halabja on the international discourse on the uses, ban, and presentations of the chemical weapons (Koblentz, 2019).

The chronic, multisystem morbidity in survivors exposed to sulfur mustard and mixtures of agents has been documented in the population; persisting comorbidities include impaired pulmonary dysfunction, eyewear, and skin sequelae (Balali-Mood & Balali-Mood, 2015; Ghanei & Harandi, 2011; Zarchi & Balali-Mood, 2013). Emergent data on cancer and reproductive effects highlight the possibility of intergenerational health in exposed families, including birth and long-term defects, requiring specialized health care attendance (Balali-Mood & Balali-Mood, 2015). Although hydrolysis occurs in sulfur mustard, the debate remains on recovery of the environment versus toxicity persistence due to degradation products, nature of soil/water transport mechanisms, and the issues of cumulative stressors in agriculture and livelihoods (Thiermann et al., 2013; Worek et al., 2016). Psychosocially, the coping mechanisms of post-traumatic stress, depression, and complex grief remain persistent in their identities, interpersonal relations, and shared memory, having an unequal access to culturally competent resources (Mousavi et al., 2016). As a symbol and a test of the enforcement of international norms, Halabja has become relevant to the treaty regime and even responses to crises under the Chemical Weapons Convention or even beyond it in the case of post-Syrian accountability discussions (Koblentz, 2013, 2019).

In is necessary to conduct the present research to synthesize the scattered evidence on biomedical, environmental, psychosocial and policy-related information into a qualitative account focusing on the lived experiences of survivors and considering the scientific data. It combines these three dimensions of health, ecological, and social recovery to highlight interconnected health, environmental, social and political impacts and find practical lapses in treatment, restoration, and awareness.

Methods

Study Design

Van Manen's (1990) hermeneutic phenomenological technique was applied in the current qualitative investigation. This methodological choice made it possible to gain a thorough understanding of the experiences of Halabja survivors and the victims' families, as well as to consider their individual narratives pertaining to community reconstruction, memory, trauma, and resilience.

Participants

Purposive sampling was used in this study to choose 12 participants, including the survivors of the 1988 chemical genocide in Halabja and the victims' relatives (7 men and 5 women). Being a survivor of the 1988 Halabja genocide or the relatives of the victims, demonstrating a willingness to participate in the study, and sharing first-hand experiences were the requirements for inclusion. Family members of victims and survivors who refused to participate in the study were excluded. The sample consisted of Halabja survivors who were subjected to a chemical bombardment in 1988 and the relatives of the dead. They were between 30 and 69 years old.

Data Collection

The data was collected via semi-structured interviews conducted from June to August 2025. The interviews took place in the homes of the people being interviewed or in other places they thought were safe. The data collection proceeded until thematic saturation was reached, at which point no additional themes emerged from ongoing talks. Some of the questions which were asked during the interviews included:

- Could you tell me about your life and family in Halabja before the chemical attack?
- How would you describe your community and daily life before 1988?
- Can you describe what you personally experienced on the day of the attack?
- What was the immediate impact on your loved ones, neighbors, and the town?

- Did you lose family members, friends, or neighbors during the attack? Would you like to share their stories?
- What physical or health problems have you or your family faced as a result of the chemical attack?
- How has this experience affected your mental health or emotional well-being?
- How do you feel the world remembers or forgets what happened in Halabja?
- How has the attack affected your children or grandchildren, even if they were born later?
- What support do you still need, personally or as a community, that you have not received?
- If you could speak directly to the international community, what would you say?

Each interview lasted between sixty and eighty minutes, and all of them were recorded following the participants' permission. The recordings were then transcribed word for word and translated into English for analysis.

Data Analysis

The six methodological activities suggested by Van Manen (1990) directed the data analysis. The initial exercise entailed turning to the character of lived experience where the lead researcher as a former researcher on genocide and Anfal, who grew up in a related community, grounded the investigation in close familiarity. The second task was to explore the experience as it is encountered, the team used Halabja genocide survivors and victims' family members with firsthand experiences. Based on the phenomenological thematic analysis, important themes were identified as the third activity. The fourth activity involved the description of the phenomenon through writing and rewriting to reflect the voices of the participants. The consistency of the fifth activity was high in relation to the phenomenon as each theme was contextualized within the experience of the participants. Lastly, the derived parts and whole were stabilized through shifting between coded transcripts and the holistic themes (Van Manen, 1990).

Trustworthiness

To provide credibility of the findings obtained, the long-term involvement of the respondents, the member-checking approach, the professional peer debriefings were used. The intimate data collection was facilitated by the participants in a good relationship with the researchers. The rich experience of the researcher in forensics and genocide studies gave the work more legitimacy and more context. The transcripts were weighed several times, and the accounts that the participants made were translated literally into the interpretations.

Ethical Considerations

The study was ethically approved by Ethics Committee of Hawler Medical University College of Nursing (Project No. XX; Approval Date: DD MM YYYY). Participants were explained in detail the purpose of the study, the procedures of confidentiality and the rights of the subjects including the right to decline to participate at any time. Each respondent signed an informed consent form along with a voluntary declaration form. Anonymity of the participants was maintained by assigning each of them a code (e.g., P1, P2, etc.) to ensure that all physical or digital data were secure.

Results

The findings of the current study draw the protracted shadow of the Halabja chemical attack in bodies, households, landscapes, and institutions. Participants outlined a spectrum that went past acute survival to protracted crisis characterized by chronic ill health, displacement, environmental degradation, and disparate social recovery. Patterns converge around enduring health burdens; fractured social ties and barriers to return; contested remediation of land and water; deep psychosocial trauma alongside resilience; and political struggles for recognition that reverberate in international debates on chemical weapons. The following themes and subthemes are presented using the words of the participants to bring lived experience to the fore along with policy and scientific discussions.

Main Theme 1. Lasting Humanitarian and Health Consequences

The attack resulted in long-term injuries that survived longer than headlines and emergency reactions. Survivors operate in poorly resourced medical infrastructures and experience pain and disability in their lives on a daily basis. Such consequences are life choices which are adopted decades later

"Decades later, my lungs still seize at the first dust storm, and I carry an inhaler like it's part of my body. Pain has a way of keeping the past alive." – P3

"The doctors call it a cluster of chronic conditions, but to me it's just the daily tally – breath, skin, eyes, and the tremor in my hands. Every symptom traces back to that day." – P7

Subtheme 1.1. Chronic Illness and Disability

Patients report chronic experiences of dyspnea, scarring, visual impairment, neuropathic symptoms, and difficulty in moving. Disabilities disrupt work, caregiving, and dignity. Care remains patchy and expensive.

"I used to be a teacher who walked to school; now I count steps between furniture, so I don't fall. Oxygen cylinders and eyedrops are my new textbooks." – P5

"My skin burns under the sun, and my eyes blur by afternoon. The body keeps its own archive of the attack, and I read it every day." – P1

Subtheme 1.2. Generational Health Concerns

Birth defects, miscarriages, and unexplained illnesses are the reasons why families are concerned about a child being born years afterwards. There is only so much genetic technology can do, and due to that, fear finds a way to fill it. Old fears are trotted up with each pregnancy

"We hold our breath at every ultrasound, afraid of what the screen might reveal. Pregnancy should be joyful, but in our town, it comes with a tremor of old fear." – P9

"My daughter was born with a heart condition the doctors can't fully explain. They say genetics is complicated, but we know which history we carry." – P4

Main Theme 2. Displacement and Social Fragmentation

The attack fractured communities, sending families across borders and scattering kin networks. Homes, livelihoods, and neighborhood bonds are unraveled. The return journey was uneven, haunted by loss and uncertainty.

"Our address became a tent number, and our neighbors turned into stories we tell the children. Home had grown small to what we could carry away." – P11

"The terrain of my childhood is porous with checkpoint and vacant lots. We learned new dialects faster than we learned to sleep without fear." – P5

Subtheme 2.1. Forced Migration and Loss of Homeland

Journey was sudden, improvisational, and perilous. People moved under fire and fumes, guided by survival rather than destination. Homeland became a task of memory.

"We left before dawn with wet scarves on our faces and nothing in our hands. By the time the sun rose, we were already strangers to our own fields." – P2

"I can still trace the path to the border by the sound of crying. The dust of that road is in our lungs and our language." – P8

Subtheme 2.2. Barriers to Return and Reconstruction

The reconstruction is coupled with concerns of pollution, lost titles, unexploded mines, and spindly civic services. Support is inconsistent, and there are no strong ties with the institutions. People send back and forth from desire to fear.

"They told us that it was safe, but as soon as the first rain-shower fell there was an odor which made us stay away. How can you put in even charted seeds when you cannot depend on the ground to take care of them?" – P10

"Warrants, compensation documents and waiting

lists mounted higher than our broken walls. We have repaired our hands with, but it is tougher to re-establish normalcy and safety in terms of yourself and your own positions in the world." – P3

Main Theme 3. Environmental Damage and Contamination

The terrain soaked the bombardment as did its humans. Fields, streams, and orchards became silent or even sick, and recovery is patchy and contested. The farmers assess damage in terms of seasons and crop yields.

"The apricot trees flowered but the fruit was bitter for years. Even the animals seemed to know which water to avoid." – P6

"We learned to read the land like a patient chart – stunted wheat, dead fish after heavy rain, and a well that nobody drinks from anymore." – P12

Subtheme 3.1. Soil, Water, and Agricultural Harm

Chemical agents and cleanup residues changed the chemistry of soil and water. Harvests fell, livestock sickened, and traditional practices were interrupted. Community knowledge often replaced missing lab reports.

"My father kept notes on yields, and there's a cliff in the notebook after the attack. Numbers don't lie; the earth just gave us less." – P9

"The spring near our village turned metallic in taste, and the sheep refused it before we did. We started hauling water from farther away, at a cost our pockets could feel." – P1

Subtheme 3.2. Recovery or Persistent Toxicity

There are differences of opinion as to whether the land has healed. Some trust rain and time; others insist on testing and precaution. Scientific studies are sporadic and poorly communicated.

"They say the rains washed it all away, but our bodies and the yellow patches in the field tell a different story. Hope is not the same as a lab result." – P3

"A team came once, took samples, and left with promises. Until we see the data and the cleanup, we keep a careful distance from certain plots." – P6

Main Theme 4. Psychosocial Trauma and Community Recovery

The injuries are psychic as well as physical, brought along in memories as well as relationships and rituals. Healing takes place not just in clinics, mosques, and homes but also in classrooms. Recovery is a long conversation across generations.

"I don't dream in color anymore; everything turns the same gray as that day. Some mornings I count the names before I count the blessings." – P12

"We have learned to mourn and to make tea at the same time. Grief became the language we all understand." – P1

Subtheme 4.1. Individual and Collective Memory of Suffering

Memory anchors identity through photos, anniversaries, and the memorial. Families navigate when to speak and when to be silent. The past is told in both whispers and public ceremonies.

"Every spring, the air feels heavier, and the city walks more slowly. The calendar itself holds its breath around the anniversary." – P9

"At the memorial, I look for my mother's name and find my own reflection. We use our faces as replacements of faces that we lost." – P5

Subtheme 4.2. Coping, Resilience, and Support Systems

There is faith, humor, activism, and simple rituals by which people cope. Formal mental services are rare, yet they are valuable Diaspora-based networks and mutual aid fill the gaps.

"The women's group meets on Thursdays, and we sew, talk, and sometimes just sit together. Those hours are lighter than pills." – P8

"Counselors taught us how to breathe through a panic, but my nephew learned to breathe again by playing football. Healing takes many languages." – P4

Main Theme 5. Political and Global Dimensions of Chemical Genocide

Halabja is a local tragedy with international echoes.

Recognition, accountability, and prevention remain unfinished work. The town's name appears in courtrooms and treaty halls.

"Our pain travels to parliaments and conferences, but it often returns without action. We are weary of being an unpaid cautionary one." – P5

"In speeches, they say never again, and we nod. Then we come home to clinics with no stock." – P11

Subtheme 5.1. Struggles for Recognition and Justice

Victims seek legal and compensation claims, and apologies. Bureaucracy and geopolitics make the way more complicated. Recognition itself can be a form of care.

"I testified so my children would know our suffering has a legal name. Justice moves slowly, but silence was slower." – P2

"Compensation helps with medicine, but acknowledgment helps with sleep. We need both to feel the world has heard us." – P7

Subtheme 5.2. Halabja in International Debates on Chemical Weapons

The city of Halabja has taken its toll in shaping global norms, inspection, and sanctions. It is cited in classrooms, at the Organization for the Prohibition of Chemical Weapons (OPCW), and in discussions on accountability. Yet policy often feels distant from the lived reality.

"They show our photographs to diplomats to argue for stronger treaties. I want them to remember that those are not symbols; they are families." – P4

"If Halabja means anything in the world, it should mean resources for prevention and care. Otherwise, the world learned the story but not the lesson." – P10

Discussion

The results contextualize Halabja within an emerging literature on sulfur mustard (SM) exposure and make contributions to this literature in critical areas. The studies that exist discuss a long-term multi-organ damage, psychological and social harm, and the lack of integrated health systems but do not put these medical journeys alongside the individual experience of displacement, environmental uncertainty, or perceptions of identity politics. In weaving across bodily, ecological, and political registers of survivor testimony, the findings signify the role of unverified safety, intergenerational fear, and loss of dignity in how recovery and biomedical injury should be understood. The following sections critically source each theme against peer-reviewed and technical resources and point out where the data support or challenge existing evidence and where they contradict or supplement existing literature.

The high emissions of chronic respiratory, ocular, cutaneous, and neurologic sequelae in the findings auger well with the Iranian and regional literature on long-term SM morbidity. Chronic airway disease (bronchiolitis obliterans, chronic patterns) and airway hyperresponsiveness are repeatedly reported by reviews and cohort studies; reduced exercise tolerance and frequent exacerbations elicited by dust and infections are also consistently documented (Ghanei & Harandi, 2011; Balali-Mood & Balali-Mood, 2015). Ocular complications – delayed mustard gas keratopathy, dry eye, limbal stem cell deficiency, and recurrent epithelial defects – are also well known and in many cases, progressive decades after exposure (Baradaran-Rafii et al., 2017; Balali-Mood & Balali-Mood, 2015). In the present study, the participants' reports of neuropathic pain and tremor echo smaller studies suggesting peripheral neuropsychiatric sequelae among SM-exposed survivors, though neurologic evidence is comparatively less robust and methodologically heterogeneous (Razavi et al., 2012).

Where the results add critical context is the coupling of morbidity with fragile health systems: "patchy and expensive" care, medicine stock-outs, and fragmented specialty access. Although regional overviews note constrained post-conflict health capacity in Iraqi Kurdistan, the granular linkage of disability to foregone work, caregiving burdens, and dignity loss is less visible in biomedical papers that foreground organ-specific pathologies (Shabila

et al., 2010; Razavi et al., 2012). The data therefore corroborates clinical trajectories while foregrounding the health-system and socioeconomic determinants that compound disability.

Anxiety about birth defects and miscarriages is also repeated in interviews. The available evidence associated with intergenerational effects of being exposed to SM is inconclusive. There are reports of greater chromosomal aberrations, oxidative stress markers, and the potential of epigenetic changes in exposed adults, although there are little to no correlations at the population level with congenital fetal/infant anomalies (Razavi et al., 2012). In Iraq more broadly, contested ecological studies from Fallujah reported increased birth defects and metal contamination following intense combat (Al-Sabbak et al., 2012), but causal inference is debated and not specific to SM. The findings sharpen the point that, in the absence of sustained genetic counseling and transparent surveillance, uncertainty itself becomes a clinical and psychosocial burden, an insight largely absent from the biomedical literature, which tends to conclude "evidence insufficient" without considering how uncertainty is lived in pregnancy and family planning.

The narratives of sudden journey, dispersed kin networks, and uneven return mirror broader post-2014 displacement literature in Iraq that documents lingering barriers to safe, voluntary return: property disputes, documentation gaps, contaminated land, and weak services (IOM, 2019; Cetorelli, 2017). Few SM-focused clinical papers analyze displacement as a determinant of long-term health; the results fill that gap by linking social fragmentation to ongoing health stressors (e.g., disrupted caregiving networks, dialect/language shifts, and bureaucratic precarity). They also show how "addresses becoming tent numbers" reconfigures identity, an issue more commonly treated in forced migration scholarship than in chemical-injury research.

The participants' accounts of stunted crops, foul-smelling wells, and "metallic" tastes foreground environmental uncertainty and contested recovery. The environmental fate literature generally predicts that SM hydrolyzes to thiodiglycol and related products and that persistence is context-dependent (pH, temperature, soil organic content), with surface contamination typically diminishing over time, though buried munitions/residues complicate risk (Noort et al., 2011; UNEP, 2017). The gap the results spotlight is less about chemical kinetics than about governance: sporadic studies, poor communication of results, and mistrust when "a team came once, took samples, and left with promises". That aligns with post-conflict environmental assessments in Iraq that emphasize patchy monitoring, weak risk communication, and uneven remediation financing (UNEP, 2017). In short, the literature offers a chemical story of probable decay; the data adds a social story of unverified safety, leading to rational avoidance of land and water despite livelihoods depending on them.

Disability, poverty, and institutionalization as sequelae of conflict disorders (i.e., PTSD, depression, and anxiety) are still higher in SM survivors and Iraqi conflict victims, and they depend on chronic exposure to stressors (Razavi et al., 2012; Hashemian et al., 2015). The accounts resonate with this evidence but advance it in two ways. First, they trace the choreography of collective memory – anniversaries, memorials, photographs – and its double edge: sustaining identity while reactivating grief. Second, they foreground vernacular recovery: women's sewing circles, football, tea rituals, and diaspora mutual aid as "lighter than pills." This complement clinical recommendations for psychosocial support by specifying community-based modalities that are accessible in under-resourced settings and consonant with local norms. The literature increasingly recognizes such layered, non-clinical supports, but empirical detail from Halabja itself has been sparse in the literature.

The last theme ascertains a persistent mismatch: Halabja as an icon in treaty venues and material losses in survivor care. Halabja is routinely referenced in the Chemical Weapons Convention review conferences, OPCW research, and education/outreach initiatives, but as the survivor

testimonies in the study indicate, it can have a detrimental impact on progress towards projecting norms in the face of a lack of reparation payments, financing of medical services, and environmental restoration. This critique is consonant with human rights analyses that warn against instrumentalizing atrocity narratives for global norm entrepreneurship without local benefit (HRW, 2013). The participants also stress that recognition is itself therapeutic – "acknowledgment helps with sleep" – pointing to justice and documentation as elements of care, a point underdeveloped in clinical literatures.

Across domains, the results corroborate the durability of multi-organ morbidity after SM exposure; the interdependence of physical and mental health; and the critical role of social determinants, including displacement and weak services, in perpetuating suffering (Ghanei & Harandi, 2011; Razavi et al., 2012; IOM, 2019). The results also expose persistent gaps, including limited longitudinal, population-based surveillance in Halabja; sparse, transparent environmental testing and communication; and weak integration of clinical care with property restitution, demining, and water/soil safety.

Conclusion

Almost forty years after the Halabja chemical genocide, the event still defines bodies, landscapes, and institutions. The survivors have to deal with chronic disease, psychosocial trauma, uncertainty in their environment and lack of justice. This paper emphasizes the interconnection between biomedical, social, and political harms and reveals that recovery is non-linear, and incomplete without multipronged health, environmental, and repair interventions.

Implications

The key to sustainable recovery is the collective effort of the overlapping long-term medical care, environmental visualization, culturally based psychosocial support, and political acknowledgment. The combination of spectral evidence and witness or survivor testimony can enhance more efficient remediation policy, resource deployment and can make sure that the legacy of Halabja enhances local resilience, as well as global resilience to avert chemical atrocities.

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