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Title

Beyond Occupational Injury: Exploring Lived Experiences of Marginalization and Survival among Injured Coal Miners in Bangladesh

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Abstract

Background: While mining accidents are commonly documented in terms of fatalities and technical or operational failures, the long-term human costs experienced by injured miners and their families remain largely overlooked in both research and policy discourses. This study aimed to document the lived experiences of injured miners in Bangladesh in the aftermath of mining accidents, highlighting their ongoing suffering and struggles, and exploring how these experiences shape their livelihoods, mental well-being, family economic realities, and social lives over time.

Methods: A qualitative approach was employed to explore the post-injury experiences of miners who were involved in workplace accidents at the Barapukuria Coal Mine in Dinajpur, Bangladesh. Individual, in-depth, unstructured interviews were conducted using a testimonio method to capture miners' lived experiences of injury, work disruption, and the long-term socio-economic and psychological consequences. Fifteen injured miners were recruited through purposive and snowball sampling. Data were analyzed using inductive thematic analysis to identify patterns across participants' narratives.

Results: Twelve themes emerged from the testimonios of injured miners: "from miners to beggars," "the lands are all gone," "the uncertain future," "the haunting memories," "I have never seen my babies," "loss of self-worth and self-identity," "I found a new name," "social isolation," "stigma and discrimination," "demand for Occupational Safety and Health (OSH)," "society as shared responsibility," and "call for rehabilitation." These themes

were grouped into four broader aspects – economic, psychological, social, and urge to live - embedded within the social structure of the mining industry.

Conclusion: Mining accidents in Barapukuria cause prolonged physical, psychological, and socio-economic harms, exposing systemic neglect and unsafe practices, highlighting urgent OSH, rehabilitation, mental health, compensation, and social protection to break cycles of injury, vulnerability, and marginalization.

Keywords

Coal mining, Occupational rehabilitation, Accident, Injury, Sufferings, OSH, Testimonio.

Background

'*An accident brings cry for the whole life'*, a message often seen on the roads of Bangladesh, gives a sobering reminder of the long-term impacts that road accidents can have on people's lives. Although this phrase generally refers to road accidents, in a broader sense, any workplace accident can equally cause a lifetime of tears. In 2023, the International Labour Organization (ILO) projected that approximately three million people die each year as a result of work-related accidents and diseases, with the majority of these deaths attributed to occupational diseases and that 395 million workers sustain non-fatal work injuries worldwide [1]. The idea that succumbing to injury and illness are an inevitable outcome of hazardous work has never been supported by the ILO; rather, it always puts emphasis on Occupational Safety and Health (OSH), as countries with enhanced OSH have been reported to have the fewest accidents and illnesses [1, 2]. Besides, the Sustainable Development Goals 3 (Good Health and Well-being), 8 (Decent Work and Economic Growth), and 16 (Peace, Justice, and Strong Institutions) in particular also connect and advocate for safe and secure working environments for workers and the promotion of their rights [3]. Despite being

a global concern, in reality, poor safety culture, neoliberal policy, and most importantly, lack of priority result in frequent accidents that claim the lives of workers and, if survived, cause immeasurable suffering for them and their families [1]. The situation is worse in the lower-middle-income countries like Bangladesh. According to the Occupational Safety, Health, and Environment (OSHE) Foundation, in Bangladesh, unsafe working conditions contributed to the deaths of 1,432 workers in 2023 alone, representing a 48% increase over the previous year, with an additional 502 workers who incurred severe injuries [4]. The country has witnessed some of the harrowing workplace tragedies, such as the Rana Plaza collapse (2013), the Tazreen Fashions fire (2012), and the Sitakunda explosion (2022), which have claimed the lives of thousands of workers and left their families devastated, scars that remain unhealed to this day [5,6,7]. Survivors, along with their families, still have to fight with physical challenges, trauma, unemployment, and economic hardships [8,9,10].

Mining, “the selective extraction of rocks and minerals from the earth’s crust, in such a way that it is economically profitable”, is considered one of the oldest and riskiest occupations in the world [11]. Mine workers or miners, especially working in underground coal mines and hard rock mines, constantly expose themselves to hazards such as gas or dust explosions, gas intoxication, improper handling of explosives, electrical burns, fires, collapse of mine structures, rock falls from roofs and side walls, flooding, slips and falls, and accidents caused by malfunctioning or improperly used mining equipment [12]. For example, studies on artisanal and small-scale mining in Zimbabwe have similarly shown that miners are frequently exposed to multiple occupational hazards and that inadequate safety practices, limited training, and weak risk-mitigation systems significantly increase the likelihood of injuries and accidents in mining environments [13, 14] Miners typically work in conditions with hardly any lighting, up in the hills or in locations that are geographically inaccessible to health care services and

other support systems. The economic importance of mining for a country is undeniable, and from the perspective of employment generation, it employs 1% of the global workforce, which is approximately 30 million people. Besides this, a huge number of subcontracted miners are also employed. Although the workforce is not large, it accounts for about 8% of fatal workplace accidents globally (around 15,000 annually), making it one of the most accident-prone industries [15]. This disproportionate burden of fatalities relative to workforce size has made mining a critical global occupational health concern and a focal point in discussions on labour safety, industrial regulation, and workers' rights in extractive industries worldwide [16]. Consequently, understanding mining accidents is not only a local industrial issue but also part of a broader global debate on how economic development, resource extraction, and labour protection intersect in both high-income and low- and middle-income countries [16, 17]. China, the country which employs the most significant number of workers in the global coal mining industry, is responsible for the highest number of deaths (250000) in mining accidents since 1949 [12]. In 2023 alone, the country reported 57 coal mine accidents and 160 deaths [18]. Similarly, the mining sector continues to have the highest accident rates of any industry in both Australia and the United States [19]. A total of 6,565 mining accident cases were reported in Indonesia in 2021 [20]. The exact number of injuries is unknown, as many were hidden and underreported. If this is the picture of developed nations, the situation in lower-middle-income countries with hardly any legal framework or policy on OSH cannot be imagined. Such accidents often result in severe economic damage, disrupting productivity and, above all, the irreplaceable loss of life that cannot be recovered or compensated for in any way [21]. According to the study by Bayraktar et al. (2023) [21], miners usually experience their first accident (due to environmental or personal factors) within their first year of work. For survivors, such events can be extremely distressing and traumatic, producing both immediate psychological effects and lasting mental health consequences [22]. In addition to the psychological consequences of the

victim, mining accidents can also alter family economies, heighten healthcare needs, and affect family members, including children, both economically and socially [23].

However, much of the existing literature on mining accidents has primarily focused on technical causes, safety engineering, and accident-prevention mechanisms, with comparatively limited attention to the long-term socio-economic and psychological consequences experienced by injured miners and their households, particularly in the Global South [17]. Bangladesh, a country rich in natural resources such as natural gas, coal, hard rock, limestone, and white clay, began its mining journey in the late 19th century with the establishment of coal mining operations in the greater Dinajpur district [24]. The Barapukuria Coal Mine (BCM), the country's first and only active coal mine, discovered by the Geological Survey of Bangladesh (GSB) in 1985, began its operations in 2005 after an agreement made with a Chinese company, namely China National Machinery Import and Export Corporation (CMC) in 1994 [25, 26]. The agreement promised to produce 1 million tons of coal per year from about 303 tons of the reservoir over 25 years of mine life, using underground mining, with financial and technical assistance from the CMC [25]. Coal from the BCM is used in the nearby thermal power plant, which consists of two 125-MW units and one 275-MW unit, and contributes to the national energy sector, although the plant is often reported to have underperformed due to technical failures and coal shortages [27]. Miners working in the mines continue to risk their lives and pay a heavy price for the country's economic and infrastructure development.

In addition to the adverse environmental impacts to the adjacent areas [28], a lack of adequate regulatory oversight and legal policy on safety issues has made the working conditions in the BCM hazardous for the miners who regularly face accidents resulting from roof fall, water inrush, increased temperature and humidity, poisonous gas emission, mechanical and electrical failures [29]. Thus far throughout the country, coal mining-related deaths

have claimed the lives of at least seven people. Five are either completely disabled or severely hurt. Moreover, 70-80 people have minor injuries [30]. However, according to workers and locals, the actual figures are likely to be much higher, as many accidents go unreported by the mine authorities. In the BCM, specific underground working sections, called “faces,” such as Face no. 1105 and Face no. 1108, which are designated production areas within the longwall mining operation, were reported to have experienced roof collapses, toxic gas exposure, and extremely high temperatures with humidity, leading to miners suffering life-threatening injuries or fatalities during those operations [26].

Although mining safety in Bangladesh is formally governed by legal provisions, the regulatory framework remains limited and outdated. The primary legislation regulating mine safety is the *Mines Act of 1923*, which was enacted to regulate the inspection and operation of mines and to ensure basic safety conditions for workers. The Act authorizes government-appointed inspectors to examine mine conditions, investigate accidents, and enforce compliance with safety provisions in mining operations [31]. This framework was later modified through the *Mines (Amendment) Act, 1967*, introduced during the Pakistan period before Bangladesh’s independence. The amendment largely reflected the administrative and industrial priorities of the Pakistani state and did not substantially strengthen protections for mine workers or address evolving occupational safety concerns in the sector [*32*]. After independence, mining governance was further addressed through the *Mines and Mineral Resources (Control and Development) Act, 1992*, which primarily focused on the ownership, licensing, and regulation of mineral resource exploration and extraction [*33*]. While this legislation strengthened state control over mineral resources, it paid comparatively limited attention to occupational safety issues, leaving worker protection in mining operations relatively underdeveloped within the broader regulatory framework. In practice, many labour-related issues in mining operations are

currently addressed under the *Bangladesh Labour Act, 2006*, which provides a general framework for workplace safety and labour rights across sectors [34]. As this legislation is not designed specifically for mining activities, it provides limited scope to address the unique occupational hazards faced by miners, particularly in underground operations. However, the implementation of these regulations remains weak. Inspections are often irregular, safety standards are inadequately maintained, and accident records are poorly documented, reflecting limited regulatory oversight in practice [35].

The mining industry of Bangladesh represents a stark example of neoliberal economic policies which prioritize profit at the cost of labor rights, social welfare and environmental sustainability [29, 36]. To maximize profit, these private companies pursue cost minimization, resulting in poor safety regulations, a limited emergency response system, inadequate infrastructure, and minimal worker compensation. In return, the workers pay the price through inevitable accidents and long-term suffering [37]. These accidents not only cause injuries and death of miners but also affect their families in the long run, as they are left with limited or no financial support. Although there exists a significant number of studies focusing on the immediate causes of mining accidents, such as technical failures and unsafe practices, there are hardly any studies that explore the long-term effects; the broader socio-economic and psychological consequences of mining accidents on these injured miners and their families, particularly in the context of Bangladesh.

By examining the lived experiences of injured miners and their families, this study contributes to the growing body of literature that seeks to move beyond technical explanations of mining accidents and instead foregrounds the human, social, and structural consequences of occupational hazards in extractive industries. In doing so, the study provides empirical evidence from Bangladesh that enriches global discussions on labour precarity,

occupational risk, and the hidden social costs of resource extraction in lower-middle-income countries.

Given the context, this study aims to reveal the true human costs of mining accidents in Dinajpur, Bangladesh. In particular, it focuses on the socio-economic and psychological impacts of mining accidents on the injured workers and their families. A total of 15 injured miners participated in this study, all of whom were male, as no female miners are employed at the Barapukuria coal mine.

Theoretical Framework: Biological Citizenship and Injured Workers

This section outlines the theoretical perspective used to understand the experiences of injured miners in Bangladesh, by drawing on the notion of biological citizenship, developed by Adriana Petryna (2002). The main assertion of this idea highlights on how bodily injury, illness, and exposure to risk reshape relationships between citizens, institutions, and the state [38, 39]

The concept of biological citizenship emerged from Adriana Petryna's study of populations affected by the Chernobyl nuclear disaster [38, 39]. In her analysis, Petryna showed how individuals whose bodies were damaged by radiation exposure mobilized medical evidence, disability status, and scientific categories in order to claim state recognition and social benefits [38]. Biological citizenship therefore refers to forms of citizenship in which individuals make claims to rights, resources, and protection based on biological conditions such as illness, injury, or bodily harm [39]. Rather than being defined solely by legal status, citizenship in such contexts becomes mediated through the injured or exposed body.

This framework highlights how modern governance increasingly relies on biomedical classifications to determine entitlement to compensation,

healthcare, and social protection. Individuals whose bodies have been harmed must demonstrate their injuries through medical documentation, institutional recognition, and bureaucratic procedures in order to access support [40]. As a result, biological damage becomes both a source of vulnerability and a basis for political claims.

In the context of hazardous industries, biological citizenship provides an important lens for understanding how workers who sacrifice their bodies for economic development attempt to negotiate recognition and justice. Dangerous labor environments expose workers to accidents and long-term health consequences that fundamentally reshape their lives [39]. When such injuries occur, workers often seek compensation, medical treatment, rehabilitation, and institutional acknowledgement [38, 40]. However, these claims are not always fulfilled, particularly in contexts where labor protections are weak and institutional accountability is limited [41].

The experiences of injured miners in Bangladesh reflect many of these dynamics. Mining accidents in Barapukuria resulted in severe bodily harm including amputations, blindness, spinal injuries, and other long-term disabilities. These injuries did not only affect the miners' physical abilities but also transformed their economic roles, social identities, and psychological well-being. Once primary breadwinners of their families, many participants became unable to work, pushing their households into financial hardship and long-term poverty.

Within this context, injured miners attempted to claim recognition and support from various institutions, including the mining company, labor unions, and the state. Participants repeatedly described their efforts to obtain compensation, medical treatment, rehabilitation, and alternative employment. These claims illustrate how injured workers mobilize their damaged bodies as evidence of entitlement to institutional support. However, unlike the Chernobyl disaster studied by Petryna, the Bangladeshi state largely fails to recognize these 'biological claims'; instead, workers frequently

encounter bureaucratic neglect, corruption, and institutional inaction, resulting in what can be described as a form of 'political silence'.

The framework of biological citizenship also helps explain how bodily injury reshapes social identity and belonging. Studies on biological citizenship demonstrate that when individuals experience bodily damage or illness, their social identities often become closely tied to their biological conditions and medical classifications [38]. Several participants described how their identities within their communities changed after the accident. Many were no longer recognized by their formal names but instead labeled by their disabilities, such as “lame” or “blind.” This transformation illustrates how injured bodies become socially visible markers that redefine individuals’ place within the community. Rather than being valued as productive workers, they become associated with incapacity, dependency, and stigma.

Furthermore, biological citizenship draws attention to the uneven distribution of protection and care in modern societies. While industrial development often relies on the labor and bodily risks of workers, the benefits of such development are not equally shared. In the case of the Barapukuria coal mine, participants noted that their labor contributed to national energy production and economic growth. Yet those who were injured in the process often received minimal compensation and limited institutional support. This contradiction highlights how workers’ bodies become central to economic development while the responsibility for care and protection remains unevenly distributed, often leaving injured workers marginalized despite their contributions to national progress.

At the same time, the testimonies show that injured miners do not simply remain passive victims. Instead, many participants expressed demands for occupational safety, proper compensation policies, and stronger institutional accountability. These demands represent attempts to transform their biological suffering into political claims for justice and recognition. In this

sense, the injured body becomes a site through which broader questions of rights, responsibility, and social justice are negotiated [39].

Taken together, the concept of biological citizenship provides a useful theoretical lens for interpreting the experiences of injured miners in Bangladesh. Through this framework, the study examines how bodily harm produced in hazardous labor environments becomes central to workers' negotiations with institutions and their claims for recognition, care, and compensation. It further draws attention to how injured bodies may reshape workers' social positioning, economic stability, and interactions with institutional structures. By foregrounding the injured body as a site of both vulnerability and political claim-making, this framework helps illuminate the broader structural dynamics through which inequalities are produced and sustained in the mining sector, particularly highlighting the gap between biological claims and state recognition, where 'political silence' leaves injured workers marginalized.

Methodology

Study Design

This study aimed to unveil the human costs of mining accidents in Dinajpur, Bangladesh, and therefore the study adopted a qualitative design, which is well-suited for capturing nuanced human experiences [42, 43, 30]. To center the lived realities of those most affected, the study engaged in collecting *testimonios* from injured miners. *Testimonio* is both a process and an approach through which marginalized individuals orally share their life experiences to highlight forms of social inequality that are often silenced or overlooked [45]. In this process, the interviewer, who can be a researcher, journalist, or advocate, works to bring the person's words and stories to a wider audience to inform efforts to address those inequalities.

This approach was particularly appropriate for the present study because, first, it validates the experiential knowledge of working-class miners, acknowledging them as critical sources of insight into the structural, institutional and socio-cultural forces that shape their health, safety, and dignity. Moreover, it departs from traditional research models that tend to objectify or marginalize participants' voices, instead positioning miners as active producers of knowledge whose testimonios reveal the social realities of marginalization and resistance [46].

In this sense, to ensure that participants' voices remained central, the study conducted data collection through an insurgent stance, which resists extractive models of research and instead values, community knowledge, oral traditions, and lived realities as self-validating systems. This approach not only enabled participants to feel respected and engaged but also situated their struggles within broader cultural and structural contexts [47]. This methodological orientation allowed participants' narratives to illuminate the social, economic, cultural, and structural forces that contribute to occupational suffering and exclusion in Bangladesh's mining sector.

We independently developed the research concepts, questions, theoretical framing, and methodological design. Artificial Intelligence (AI) assistance was limited to language editing and formatting support.

Study Area, Participants, and Sampling

This study was conducted in the Barapukuria Coal Mine, located in the Phulbari Upazila of Dinajpur district, the only active coal mine in Bangladesh since 2005 [28]. The operation of Barapukuria Coal Mine required about 300 acres of land, displacing about 2500 people from seven villages and affecting their land, homesteads, and traditional livelihoods [48]. The adjacent communities have experienced problems regarding water pollution, noise pollution, ground vibration, air pollution, changes in the economy, loss of

farmland, land subsidence, disruption of the ecosystem, and discomfort for people [28]. The loss of farmlands and homesteads has resulted in changing the profession of the adjacent communities from farming to non-farming activities. The mine has also long been associated with accidents caused by inadequate lighting, heat, dust, poisonous gases, and other hazards [49].

Participants were miners who had sustained injuries in accidents at Barapukuria. Since no official list of injured workers was available from mine authorities or labor leaders due to confidentiality and job security concerns, participants were initially identified through news reports and local contacts. Recruitment was purposive, aiming to include participants with a range of accident experiences, injuries, and long-term consequences. Potential participants were identified through local miners, union contacts, news sources, and personal networks. Using a snowball sampling technique [50], additional participants were recruited through referrals, allowing access to hidden and hard-to-reach cases. For each referral, researchers explained the study and obtained consent from interested miners before conducting interviews. While contact with some referred participants was not possible, all miners who were reached agreed to participate.

In total, 15 injured miners, all of whom were male, were interviewed using testimonios until data saturation was reached. While the sample size is small, it is consistent with qualitative research principles that prioritize depth, context-specific insight, and the role of participants as key informants [51]. The focus was not on generalizability but on capturing the lived realities and sufferings of injured miners in order to provide a deeper understanding of their experiences.

Table 1: Participants’ information table.

#	Name (Pseudonyms)	Age	Joining year at work	Year of accident	Nature of accidents	Injuries
1	Halim	45	2001	2004	Hit by a buggy	Both legs amputated
2	Sahed	43	2005	2008	Coal collapse	One leg amputated
3	Mannan	39	2005	2020	Crushed between two buggies	Damaged leg muscles; back injury
4	Faijul	34	2002	2008	Hit by a buggy	Lost both eye sights; leg injury
5	Rafiq	40	2002	2004	Collapse of the side wall	Severe back injuries; several cuts on the body
6	Limon	35	2005	2005	Electrocution	Left hand amputated
7	Salam	38	2007	2010	Roof fall	One leg amputated
8	Zamil	34	2015	2020	Machinery Failure	Head injury;

						severe cuts
9	Abdul Mabud	48	2005	2007	Hit by the road header	Teeth broken; leg injury
10	Rasel	36	2005	2008	Rock fall	Left hand amputated
11	Mokarram	42	2006	2012	Rock fall	Left leg amputated
12	Sultan	42	2012	2016	Explosive blast	Hearing loss
13	Mijan	35	2015	2020	Brakes fail (Mechanical Failure)	Leg injury; severe cuts
14	Sohidul	52	2001	2010	Roof fall	Breaks in the lower back (Spinal region)
15	Afjal	46	2015	2020	Machinery failure	Teeth broken; One toe amputated

Data Collection

In this study, oral data collection through in-depth, unstructured interviews was chosen, as the aim was to capture the “spoken voices” of participants.

Data collection occurred between May 2025 and July 2025. The study adopted the form of testimonio, a method that foregrounds marginalized voices and frames personal accounts as collectively significant [52]. It emphasizes that individual life stories extend beyond the personal to reflect broader collective realities [50]. This method enabled participants' narratives to illuminate shared struggles while situating them within community histories.

To apply the testimonio approach, an unstructured interview guide was developed to facilitate open-ended, participant-driven conversations. Guided by an insurgent methodological stance, the data collection process was designed to resist extractive research practices and instead foreground miners' own voices and lived realities as valid and self-authored sources of knowledge. The aim was to center participants' own words, descriptions, and emotions as they recounted their experiences of mining accidents, injuries, and the resulting consequences. Each interview began with a broad, open-ended prompt inviting the participant to "share your story." Subsequent follow-up topics such as work history, family life, experiences of injury, treatment, and interactions with mine authorities were used only to encourage participants to elaborate on aspects they themselves considered most important.

All interviews were conducted in Bangla, the participants' native language, and were subsequently translated into English for transcription, coding, analysis, and reporting. In line with testimonio principles, no direct or leading questions were asked about institutional negligence, compensation disputes, or workplace safety failures. Instead, participants were allowed to shape their narratives freely, ensuring that their stories emerged organically through their own language and meanings. Sensitive themes such as health, pain, fear, or loss were explored only when participants voluntarily discussed them. This approach prioritized dignity, agency, and emotional safety, giving space for miners' silenced experiences to surface authentically. Through this data collection process and the use of an insurgent stance, the study positioned

miners not as research subjects but as co-producers of knowledge, with their testimonios serving as acts of resistance against structural invisibility.

The *testimonio* method addressed key ethical concerns by informing participants that the study sought to understand the human costs of mining accidents and assuring them that they would share only what they felt comfortable disclosing, which helped build trust and minimized the risk of re-traumatization. All interviews were audio-recorded with consent, transcribed verbatim, and supplemented by detailed field notes that captured contextual observations, emotional expressions, and analytic reflections. Together, these materials provided a rich, layered understanding of the lived experiences and suffering of injured miners in Dinajpur.

Data Analysis

Following Braun and Clarke's (2008) six-step thematic analysis, this study sought to uncover the human costs of mining accidents and to understand how injured miners narrated their personal and collective experiences of suffering, revealing how they made sense of injury, loss, and survival within broader structural conditions of labor exploitation and neglect [53]. In this study, we followed this six-step thematic analysis, which involved familiarization with the data, generating initial open codes manually, searching for patterns across interviews, reviewing themes against both coded extracts and the full dataset, defining and naming themes based on analytic depth and relevance, producing the report by presenting themes derived inductively from the data. The data analysis was conducted manually to maintain a close, reflective connection with the qualitative data.

In detail, the process began with repeated readings of the transcribed testimonios to immerse the researchers in the data, during which emerging insights, silences, contradictions, and affective responses were noted. Subsequently, initial codes were generated inductively through line-by-line

engagement with the transcripts. Phrases, metaphors, and repeated expressions capturing pain, resistance, and loss such as “burnt lungs,” “fear of darkness,” or “the silence of the company” were marked as potential codes. These codes were then collated to identify patterns across testimonios, grouping similar codes to form preliminary clusters reflecting shared experiences. Each preliminary theme was further refined through constant comparison between coded extracts and the full dataset. Thereafter, higher-order analytical themes were defined to capture deeper meanings of injury, suffering, and collective struggles within economic hardship, structural neglect, and psychological distress. Reflexive discussions were maintained throughout the research team to clarify the researcher's positionality and ensure alignment with the study’s insurgent and testimonio frameworks. Finally, twelve themes were developed using representative quotations to preserve participants’ voices, thereby situating individual experiences within the broader socio-institutional context of mining labor in Bangladesh.

Findings

This study sought to uncover the human costs of mining accidents in Dinajpur, Bangladesh. This section draws on the lived experiences and heartfelt testimonies of injured miners to illustrate both the immediate and long-term consequences of mining-related accidents. The analysis identifies twelve dominant themes, which are organized into four major sections: Economic Impacts, Psychological Impacts, Social Impacts, and Urge to Live. The discussion begins by examining the most direct and tangible consequences of mining accidents, namely the economic impacts reported by participants. It then proceeds to explore the social and psychological effects, dimensions that are often overlooked in policy and scholarly discourse. The section concludes by foregrounding the miners’ expressed desire for rehabilitation and their call for greater emphasis on occupational safety and health (OSH).

To improve the flow of the findings section, we present a summary table outlining the key themes alongside supporting quotations before the detailed thematic presentation of the findings (see Table 2).

Table 2: Key Themes and Illustrative Quotations from Thematic Analysis

Section	**Themes**	**Examples of quotes from the testimonios**
1. Economic Impacts	***(I)*** From miners to beggars	*"I used to go to work each day as if it were my last. Finally, the day came and I lost everything. Now I wander the streets of Dhaka, begging to survive"* (Halim, 45)
		"*I tried for other jobs but no one was ready to give job to a person with one leg."* (Halim, 45)
		"I couldn't find work anywhere. Whenever I tried to start something, I fell sick within days. Poverty made the house unbearable." (Sahed, 43)
	(II) The lands are all gone	*"We had a farming land enough to live a decent life […] The company acquired our land at a very low price.".* (Mannan, 39)
		"[…] we thought that establishing mine would improve the area's economy and our life. But nothing like that happened. Now, I am disabled, I have no farming land and

		also out of native home in search of livelihood" (Sahed, 43)
		"After providing initial treatment, they didn't follow up with me […] In trying to save my life, I've ruined one bigha (amount of land) of my father's land." (Rasel, 36)
	(III) The uncertain future	*"I have three children […] But I am a father who cannot even provide them something that costs five tk., let alone education."* (Faijul, 34)
		"In mining accident, I have disrupted my future along with my families" (Salam, 38)
		"If I receive treatment, my children won't have enough to eat. The medicines are too expensive. I have to choose between the two" (Sohidul, 52)
2. Psychological Impacts	***(I)*** The haunting memories	*"Have you ever watched an English horror movie? Inside the mine, it is much terrifying […] I try not to remember the day. But my constant physical pain and economic hardships remind of it repeatedly."* (Mannan, 39)
		"I face difficulties while sleeping at night. My wife says that I often

		blather at night and sometimes shouts 'help, help'." (Zamil, 34)
	(II) I have never seen my babies	*"You are in-front of me and I am unable to see you[…] The fact that breaks me most is that I have three daughters and I have not even seen single of them"* (Faizul, 34)
	(III) Loss of self-worth and self-identity	*"It would be better if the Almighty had taken my life instead in the accident."* (Salam, 38)
		"After the accident, I left no longer the guy that I used to be that time. I avoid facing people as they started to talk again about the issue. I feel very frustrated sometimes." (Rasel, 36)
3.Social Impacts	***(I)*** I found a new name	*"I cannot walk like before. People has named me Khora (Lame)[…]When I heard of this, I feel bad"* (Mijan, 35)
		"As I have turned into a blind after the accident, the villagers just relate me with this." (Faijul, 34)
	(II) Social isolation	*"I was forced to move to Dhaka. Because the family turned into an entity with daily conflicts. I understood this was due to the loss of income."* (Mokarram, 42)

		"In the early days, they (neighbors) used to treat us with such empathy. As days went away, everyone became busy in their own life" (Limon, 35)
	(III) Stigma and discrimination	*"They (the mine authority) denied what they promised. It is a clear discrimination to me and my family".* (Mannan, 39)
		"In my presence, my wife needs to go to outside for income is pathetic for me. The society does not take it as good and obviously blames me". (Rafiq, 40)
4.Urge to Live	***(I)*** Demand for Occupational Safety and Health (OSH)	*"They need to improve the safety measures".* (Rafiq, 40)
		"I was received a small training, but truly I could not make that understandable […] Miners (Bangladeshi) do not understand the commands and the Chinese do not understand what the local says." (Zamil, 34)
	(II) Society as shared responsibility	*"If I am member of these societies, they should have some responsibilities to me…My rights should be protected and given*

		properly, my child should not be deprived." (Afjal, 46)
		"The houses of those remain unlighted who light the whole country. The government must take necessary steps to ensure justice for us." (Limon, 35)
	(III) Call for rehabilitation	*"[…]they denied to bear the medical costs. If I got proper treatment, I might be able to see you".* (Faijul, 34)
		"I went to each and every doorstep; mining officials, union leaders, political faces, government officials. Everyone showed empathy and promised to take a step. I have still got nothing." (Sultan, 42)
		"As my legs were gone, I was no longer able to rejoin mining. They did not give anything to rehabilitate me." (Sahed, 43)

1. Economic Impacts

By economic impacts, the analysis captures the severe financial challenges miners faced both immediately and in the long run after accidents, mainly arising from long-term or permanent disabilities such as the loss of legs, hands, eyesight, hearing, teeth, or fingers, which stripped them of their ability to work and led to unemployment. Once family breadwinners, they

became burdens without compensation or income, often forced to migrate, adopt desperate survival strategies, and bear exorbitant medical costs that drove many into bankruptcy. This financial instability trapped them in a vicious cycle of poverty, making it impossible to provide basic needs for their families or send their children to school, as the following themes reveal.

(I) From Miners to Beggars

This theme illustrates the severe consequences of mining injuries, showing how once-respected miners were pushed into extreme poverty and, in some cases, forced into begging for survival. The testimonies of Halim and Sahed, two severely injured miners, highlight how disability and lack of institutional support turned breadwinners into beggars in urban streets.

Among the injured miners we spoke with, Halim's (45) story stood out for the way everything in his life collapsed after the accident, eventually pushing him into begging on the streets of Dhaka. He recalled:

> "It was 2004. I was working underground of the Coal Mine. It was dark inside, scary as usual. Suddenly, a buggy (a coal-carrying trolley) rushed in a full speed and hit my legs. I lost my sense. I got my sense back after seven consecutive days. I found myself in a hospital in Dhaka, unable to feel my legs. My wife said they had to amputate the left one. It felt like the sky collapsed on my head. The first question which hits me was what will happen to my family now?"

The injury left him permanently disabled, unable to work, and with no savings. As he described:

> "Working as a miner feels like digging my own grave every day. I used to go to work each day as if it were my last. Finally, the day came and I lost everything. Now I wander the streets of Dhaka, begging to survive." (Halim,45)

Although the mining authority initially covered his treatment and provided 2,500 BDT (20$) per month in compensation, the amount was grossly inadequate to support a family of four. Requests for stable employment or meaningful assistance were ignored. He shared as:

> “After taking medical treatment one and a half month, I returned to my home without a leg, without a job and with no savings. I could not understand what to do. The mine authority initially started compensating me with 2500 tk (20$). each month. I still get the same amount money. It is unimaginable that a family of four members need to survive with this amount. I requested them several time to help me with arranging a stable income source. All the time they just ignored. I tried for other jobs but no one was ready to give job to a person with one leg. Once, the leaders promised me to give a job at mine for my son but they claimed a huge amount of money, I mean bribe”. (Halim,45)

Unable to sustain his family, Halim arranged an early marriage for his daughter, struggled to keep his son in school, and eventually migrated to Dhaka during the COVID-19 pandemic when even the small allowance stopped. He uttered emotionally:

> “During the Corona (Covid-19), they stopped compensating. I had no other way rather migrated to the Dhaka city. In the beginning, I thought that it would be easy to find a job to survive in this big city. But I was wrong. I ended up begging. I really hate this but I had no other choice”. (Halim, 45)

A similar case was Sahed (43), absent from his home in Kajipara when we searched for him. Neighbors reported that he had lost his leg in a mining accident and later migrated to escape extreme poverty. We eventually located him in Narayanganj (approximately 361 km from his original locality), living in a small rented shanty. His frail body and weary eyes reflected years of struggle. He illustrated as:

> “I can’t recall the year all I know is I was cutting coal when a huge chunk collapsed on my leg, smashing it like a road roller. They took me first to Good Health Hospital in Rangpur, then referred me to Dhaka PG Hospital, where doctors amputated my leg. They fitted me with an artificial one, but I begged the company for a safer job or compensation to open a grocery shop. They never responded.”

One participant claimed that, in such cases, companies often replaced the injured miner with a family member. But with only a daughter, Sahed (43) was excluded from this option. He narrated as:

> “I lost everything. I didn’t have a single penny. The company said they replace injured miners with a family member, but I had only a daughter, so I didn’t get that chance. Somehow, I managed my daughter’s marriage, but I couldn’t find work anywhere. Whenever I tried to start something, I fell sick within days. Poverty made the house unbearable. I was forced to move to the city. At first, I begged. Later, I managed to rent an auto-rickshaw and began driving it.”

Together, the stories of Halim and Sahed reveal how mining injuries, compounded by institutional neglect, forced once self-reliant workers into begging and precarious survival, exposing how injury and neglect collapse livelihoods into poverty and dependence.

(II) The Lands Are All Gone

Participants explained how mining not only destroyed their livelihoods but also deprived them of ancestral lands. Many rural families, previously dependent on agriculture, were left landless after the mining company acquired their farms for low compensation and without proper resettlement. With agriculture no longer an option and few alternative jobs available, many were forced to join the mine, often without proper training or knowledge of its hazards.

Illustrating this process of land loss and forced entry into mining, Mannan (39) explained as:

> "We had a farming land enough to live a decent life. The mine was needed a heavy road for its vehicles. The company acquired our land at a very low price. We did not understand that time. This place lacks industries and income sources. The mining salary was very attractive. People were crazy to get a job in the mine at that time. I neither knew that it was these much risk nor I got a proper training".

One participant reported that they had little awareness of the risks associated with mining before experiencing an accident, and their perceptions changed drastically afterward. In Sahed's (43) words:

> "At first my father refused to sell the land but they (mine company) forced us and offered a job in mining. My father had to agree because we were in need of a job. I started working and saw hundreds of accidents in front of my eyes. Initially, we thought that establishing mine would improve the area's economy and our life. But nothing like that happened. Now, I am disabled, I have no farming land and also out of native home in search of livelihood".

The mining company gave primary treatment and covered initial medical costs for all the injured miners involved in this study. But the injuries for many were so severe that they had to undergo long-term medical treatments, some miners still bear ongoing medical expenses due to lifelong injuries. In order to continue their treatment, some had to sell their lands, while others have fallen into debt. Some injured miners are now living on borrowed money after becoming destitute. Rasel (36) said with frustration:

> They (mine company) promised that if someone falls ill or has an accident, they would be responsible for their treatment. They would provide medical care at the highest level until the person recovered, and as long as the person didn't recover, they would take responsibility

> for the family. But they didn't keep their promise. After providing initial treatment, they didn't follow up with me. Look, I'm still taking medicine (showing the medicine). In trying to save my life, I've ruined one bigha (amount of land) of my father's land. I had also spoken to the local administration, and they had said that this was your right to receive. I got nothing".

In sum, these narratives show that dispossession and injury are not isolated hardships but interconnected processes, where land loss, hazardous labor, and institutional neglect converge to reproduce long-term poverty and vulnerability in mining communities.

(III) The Uncertain Future

The economic consequences resulted from this accident extended across generations, limiting opportunities and leaving the families of the injured miners struggling in the long run. The injured miners along with their families found themselves into the vicious cycle of poverty. Changes in family dynamics, impact on children's education and healthcare were mainly experienced by our participants and pronounced repeatedly.

All of our participants in this study were the primary breadwinner for their families. After the accident, they became unable to contribute to their families financially which forced their partners even children to take out the role. Mokarram (42) shared as:

> "After the accident, I couldn't even sit properly. My wife had to take me to the toilet. In such a condition, how could I earn a living? I had to take expensive medicines every day. Our household was falling apart. My wife was then forced to start working as a housemaid in other people's homes. There was nothing I could do. She went through immense hardship. Whenever I remember these times, I pray that Allah never gives such suffering to anyone in their life".

The financial strains made it impossible for their children to continue their study and many miners' (Faijul, Limon, Salam, Halim) children joined working as a child labor in different sectors. Injured miners arranged an early marriage (discussed earlier in the theme *'From Miners to Beggars'*) for his daughter. Meanwhile Faijul (34) felt hopeless and uncertain about their children's future. He said that:

> "I have three children. Little children often demand for things to their father. It is pretty normal. But I am a father who cannot even provide them something that costs five tk., let alone education. Education is a luxury for us".

Salam (38) discussed how his son once a brilliant student had to left over his education just for his accident and forced to engaged in labor. He described as:

> "He (son) was a brilliant student. I had an aspiration about him. I wanted to see him as a big man. But my fate led him to leave his school. He works as a helper at the construction site. I think he hates me as a father. In mining accident, I have disrupted my future along with my families".

Some (Mannan, Jhangir, Sohidul) injured miners who still require ongoing treatment have shared how their poverty and the exorbitant medical costs prevent them from accessing proper food and healthcare for themselves, as well as ensuring proper nutrition for their children. They had to take difficult decisions among food, treatment and education. Sohidul (52) mentioned as:

> "My backbone was severely damaged in the accident. I need to take medicine every day. I require proper treatment. If I go to a good doctor, my children will be impacted. If I receive treatment, my children won't have enough to eat. If I buy medicine in any given week, we won't have enough food for that week. The medicines are too expensive. I have to choose between the two"

2. Psychological impacts

Mining accidents have triggered a range of emotional and psychological impacts on the affected miners. While the economic impacts were mostly visible, the psychological effects were invisible and experienced uniquely by each participant marked by their *testimonios*. Injured miners are unable to forget the horrible memories of their accidents, while others experience guiltiness and depression mostly arising from the economic ruptures. The research also revealed that the disabilities resulted from the accidents have not only snatched away their ability to work but also posed severe long lasting emotional challenges that cannot be measured or compensated with any means. With no institutional and mental health support their sufferings remain unheard and deepen day by day.

(I) The haunting memories

All our *testimonios* with the injured miners began with requesting them to share what happened that day and how the accident took place. We were aware and well-prepared of the emotional laces the stories could bring with. They took long pauses and heavy sighs. Each participant marked the event as traumatic and something that continues to haunt them. They shared that it is the inherent condition underground that makes the miners nervous and instils a constant sense of fear while working. Each day they witnessed small-scale accidents and just waited for theirs to come. But the experiences of their one were more horrible that they could ever expect or imagine. One participant, Mannan (39), recalled his accident in vivid detail:

> “Have you ever watched an English horror movie? Inside the mine, it is much terrifying. There are narrow tunnels, dark all around, and extreme temperature. I have both seen and experienced couple of small accidents. Look at my hands and legs. Such cuts are common for all. But the major accident that I faced in the year 2020 took my everything. I was crushed between two buggies. I just screamed and screamed. The

> controller escaped away in fear. My leg muscles were heavily damaged, and it gave me indefinable pains which I still carry out. In general, I try not to remember the day. But my constant physical pain and economic hardships remind of it repeatedly."

Others (Sultan, Halim, Zamil) mentioned of flashbacks, sleep issues, and depression. The accident memories let not them allow to live a normal and peaceful life anymore. For instance, Zamil (34), described as:

> "I can still hear the sound of explosion. After getting back consciousness at the hospital, I found my both legs amputated. It felt as if the sky had collapsed on me. I looked at my families and thought what would happen to them. I face difficulties while sleeping at night. My wife says that I often blather at night and sometimes shouts 'help, help'."

Apart from the unforgettable memories of the accident day, what broke these injured miners mentally were the financial challenges they had to go through after the mining accident. Their disabilities turned into their greatest enemies as they left them physically unable to work, either permanently or for a long period. During those treatment and recovery times, the spouses of many injured miners had no choice but to engage in different types of labor, such as domestic work, which fostered feelings of being a burden, guilt, and powerlessness. In this context, Rafiq (40) shared:

> "Immediate after the accident, the company took me to the Good Health hospital where I received treatment for three consecutive days. The company paid the hospital bill. But after that, they never looked after me and not even compensated me. I had to take further treatments for which we sold our land. It was hard days, very hard. My wife was forced to work as domestic helper to the neighboring homes. Though after my rejoining to the work, she left the job. But I can never forgive myself. For me, they had to go through lot of troubles."

(II) I have never seen my babies

Some psychological consequences of mining accidents that the study found were far deeper than expected and imagined. Depression, flashbacks, and frustration were commonly mentioned by most of the participants, but what was more heart-wrenching was someone's inability to see his own children. This reflects how worst consequences of mining accidents can be as in most of the cases, the injuries are either ignored by the mine authorities, minimally treated, or not properly compensated. Faijul was identified difficulties with his eyes after a couple of months of his accident in 2007. Immediate after the accident, the authority took the responsibility of his leg injuries and he recovered. Later, doctors marked his cornea damaged when Faijul (34) reported his vision problems. They said to him that he also got a head injury that time but was undiagnosed or just ignored. Due to the high cost of treatment and with no support from the authority, he lost his both eyesight gradually. Since then, he became unable to visualize everything and had seen not even one of his three child. He shared as:

> "I was young when I joined mining. Doctors advised me to visit Singapore or Australia for my eye treatment by which I might bring back my visions. But I was poor and helpless. I went to the mine company and mine leaders but all ignored. My eyes left untreated. You are in-front of me and I am unable to see you. I work nothing and do not go outside of my home. After couple of years of the accident, I got married and since then my wife became my support. The fact that breaks me most is that I have three daughters and I have not even seen single of them. I touch their faces and just feel them, listen to them. My heart aches to see them".

(III) Loss of self-worth and self-identity

The study found that loss of employment due to mining accidents has resulted in a profound loss of self-worth and identity among the participants. The

localities surrounding the mines are economically disadvantaged with hardly any employment opportunities what has offered later by the mine. Therefore, despite being a hazardous and precarious occupation, mining became the only source of livelihood for hundreds of families from the adjacent villages. After encountering such accidents, sufferers have either been permanently or temporarily disabled. Their inability to feed their families anymore, providing a good life for child, and becoming a burden for other members in the family foster themselves in frustration and reduced self-esteem. They no longer perceive themselves as productive members of society which marked an absence of mental health support after these accidents. As Salam (38) explained:

> "I am disabled. I am no longer able to perform everyday functioning. My wife helps me in bathing, and eating. I feel very sad and ashamed when I saw the misery of my family but could not but help. The Childs are deprived of good food and clothing. My father until his death supported a lot both economically and mentally. But now that he has died, I am all alone. It would be better if the Almighty had taken my life instead in the accident."

Besides, individuals with severe injuries have undergone significant changes in their physical appearance, daily functioning, and social roles, all of which have deeply affected their sense of identity, self-worth, and how they perceive themselves. To illustrate this experience, one participant, Rasel (36), recounted:

> "The mine company used to employ those individuals who were physically strong. This is because mining is a hard labor. I was young, good-looking, and a muscle man. They selected me from a line of hundreds. After the accident, I left no longer the guy that I used to be that time. I avoid facing people as they started to talk again about the issue. I feel very frustrated sometimes. But still, I keep faith in Allah."

3. Social Impacts

This study has also explored how mining accidents have reshaped the social world for injured miners. Once lived with dignity and sense of belonging, the life of these injured miners has been subjected to pity, negligence, and a loss of social value. Participants described how they often face discriminatory practices in securing further employment and also in accessing essential public services including healthcare. Their identity has been stigmatized and some were forced to conceal their new settlement due to perceived shame. Besides, due to the lack of rehabilitation and a proper authority to listen their sufferings, they feel socially disconnected and marginalized.

(I) I found a new name

It was very difficult to reach out the intended participants for this study as there hardly existed any official document regarding the detailed information of mining accidents and affected miners though they were significant in number. We had a list of injured miners compiled through local miners, union contacts, news sources, and personal networks. When we entered each village to collect the testimonios of injured miners and asked the locals for the address of the injured miner, they initially failed to recognize the name. When we elaborated a more on the individual, they gave us one of the most unsettling findings of this study. It discovered that these injured miners are no more identified by their formal name at the locality. Rather, their identities have been overshadowed by the disabilities caused by the mining accidents. For example, when we went to found Mijan to his village Rosulpur, we asked to the locals by his name, father name and formally employed as miners. The villagers in return inquired us that *"which Mijan? Khora (Lame) Mijan?"*. This almost happened to every participant. For instance, Mijan (35) shared as:

> "I cannot walk like before. People has named me Khora (Lame). Did not get any support but at least got a new nickname. When I heard of this,

> I feel bad. But what can I do? This was in my fortune. I have to admit it."

Similarly, the study found Faijul (34) with his new identity *kana* (blind) Faijul. We understood that his type of use in language is very much common in the rural part of Bangladesh, but this has been a real challenge for these injured miners to reintegrate socially. They have been labeled in such a way that erodes their dignity and respect. He stated as:

> "If I go outside, strangers sometimes unable to identify me as a blind at first. It's a trouble. This village has at least three Faijul. Each are identified by their separate characteristics in particular. As I have turned into a blind after the accident, the villagers just relate me with this."

(II) Social isolation

It is evident from the study that mining accidents have come to these miners with significant damages to different body parts, exorbitant medical costs, loss of income, zero or minimal compensation, and financial hardships which have strain their personal and social relationships. Injured miners reported distancing themselves from social interactions, choose isolation, or find it difficult to express their emotions clearly. While some marked emotional support from their families as the main force of recovery from the injury, others emphasized that increased economic challenges often cause family feud and worsen the emotional stress. In this context, Mokarram (42) mentioned that:

> "I was forced to move to Dhaka. Because the family turned into an entity with daily conflicts. I understood this was due to the loss of income. I had no education and only one leg left. No one was ready to give a job to a one-leg man. I found begging at the beginning. I could not return to my native home due to shame. A little of them knew the

> fact. My daughters in law house are also nearby. I do not want her to fall in troubles for me".

Participants (Limon, Faijul, Rafiq) also highlighted their changing relationships with neighbors and relatives due to their changing abilities and arising limits. In return, they avoid family gatherings, social events, and also formal places such as schools of their child. Their withdrawal marked a feeling of frustration. Limon (35) illustrated as:

> "In the early days, they (neighbors) used to treat us with such empathy. As days went away, everyone became busy in their own life. I approached to the community leaders as well as to the political to talk about my economic sufferings. They had much to do. At least, they could have given me the disability card for government allowance. I stopped visiting them. No one have time to listen us".

(III) Stigma and discrimination

The consequences of mining accidents reported by the participants in this study were deep and mostly long term in nature. The accident not just caused physical impairments, but have had cascading effects on their life. Social bias associated with such impairments made it harder for them to secure a job, accessing public services, and lacking basic rights. For example, Mannan (39), after got a severe back and leg injury were told to rejoin work. The physical pain was too heavy for him to rejoin mining. He waited and searched for alternatives, but failed to secure one as everyone thought that with such physical complexities he would not perform well. He found no such rehabilitation interventions from the government for his type of individuals. Therefore, with increased economic pressure he was forced to return to the hazardous world of mining. He expressed as:

> "I am not in a physical condition to carry out heavy workload. I told them (the mine company) to give me a light job. They gave me two conditions; leaving the job with no compensation, or to replace the work

> position in the mine. I had to choose the second but it is still heavier. Each day I return back home with extreme pain and still I need to take medicine. A significant portion of the salary went into the medicine. They denied what they promised. It is a clear discrimination to me and my family".

What exacerbate their sufferings is not having the access of tools and services they need in public places. The participants mentioned their unaffordability to buy a wheelchair (Halim), a prosthesis (Sahed), or eye transplant (Faijul). Reflecting on these challenges, Halim (45) explained: "I could not afford a wheelchair, so moving around every day was exhausting and painful. Simple tasks like going to the market or visiting the clinic became a struggle I had to endure alone."

Similarly, Sahed (43) shared his experience: "I desperately needed a prosthesis, but it was completely out of reach financially. Without it, even basic walking was difficult, and I felt trapped in my own home, unable to live independently."

Besides, another issue noted from the *testimonies*. The social structure of the region expects the male member to fulfill the duties as a breadwinner of the family. Due to their long-term disabilities, they became unable to do so. This shift in role has been stigmatized rather than understood. They have been placed in social judgements, commentary, and a sense of failure. Within this context, Rafiq (40) reflected: "In my presence, my wife needs to go to outside for income is pathetic for me. The society does not take it as good and obviously blames me".

4.Urge to live

Apart from stating a wide range of economic, social, and psychological consequences of mining accidents, participants of this study clearly marked some places of concern that either directly or indirectly are responsible for their ongoing suffering and called for change. Their *testimonies* represented

systemic issues like exploitative and unsafe working environments, lack of proper training and safety measures, fight for compensation, absent of legal support, and limited role of government. Therefore, they urged for greater accountability, regulatory oversights, importance of occupational safety and health, clear compensation policy, and the broader role of society can play to rehabilitate them in better human life.

(I) Demand for Occupational Safety and Health (OSH)

Participants reiterated that accidents are common for mining due to the hazardous environments in which miners need to expose them on a regular basis. The dark, hot, cramped, suffocating and dusty underground environment cause continuous accidents and countless injuries for miners. What made them more vulnerable to such accidents were the poorly maintained work safety by the mine authority. Some workers had undergone a token training and most not, even they came to understand the danger of mining only after their very first working day. The safety equipment provided are mostly outdated and unreliable.

In this context, participants, Rafiq (40), highlighted the harsh working conditions and stressed the need for proper safety measures. He said:

> “Inside the mine, we can’t even breath properly. The roads are so narrow that in some places we just need to crawl to reach out other side. You can hardly see anything because of the darkness. Before entering into the mine, the company gives us a small headlight, and a small oxygen canister but the batteries remain dead most of the time. They need to improve the safety measures”.

Similarly, Abdul Mabud (48) pointed out the lack of proper emergency and safety measures in the mines, emphasizing the risks faced by workers. He mentioned:

> “When accidents occur, it sometimes becomes impossible to identify and reach out the affected workers. There was no emergency response system. The phones and water system were often subjected to systemic failure. They need to wait for the lift to come. It requires a long time. It is obvious that if someone gets injured, he is just remained untreated for a long hour before reaching a hospital above ground”.

In addition to the lack of proper training, participants also mentioned a communication gap between the Chinese and local workers. Language works as a barrier in understanding the commands and directions. Zamil (34) described:

> “I was received a small training, but truly I could not make that understandable. Most accidents occur between the buggies. They are automated control. Miners do not understand the commands and the Chinese do not understand what the local says. Sometimes conflict arises. Chinese workers used to often exploit and punish the local workers”.

The voices of participants were clearly demanding occupational safety and health (OSH) in the mining industry of Bangladesh. They saw the accidents as a result of negligence of the institutions and a lack of accountability.

(II) Society as Shared Responsibility

The testimonios of miners reflect on the essence of society and the responsibilities embedded within it. The accounts highlighted that, society was not only their immediate family or community but also the company, unions, and the state all of which were expected to uphold their duties toward those who labored for the collective good. This perception of society as shared responsibility emerged strongly in Afjal’s (46) testimony:

> "You guys (the researchers) are educated and thus can know better about this. To me, the mining company is a society. Though I was a small miner, I was a member of that society. Similarly, I was a member of the labor groups or unions which is also a society. I belong to this territory (home), neighbors, and village which is also a society. If I am member of these societies, they should have some responsibilities to me. I was a productive man. My rights should be protected and given properly, my child should not be deprived."

At the same time, one participant expressed frustration over the paradox of national progress and local suffering. They acknowledged that coal from their labor powered the nation, yet their sacrifices remained unrecognized and uncompensated. Limon's (35) testimony captured this contradiction:

> "I have come to know that the coal extracted from the mines is being used to produce energy that will light the country. Obviously, it's a matter of pride for miners that they are contributors to the country's progress. But what happens to the miners who got affected, injured and deceased in the process? No one cares about them or their families. The houses of those remain unlighted who light the whole country. The government must take necessary steps to ensure justice for us."

Through these accounts, miners demanded justice, fairness, and inclusivity. They called for recognition of their role as equal partners in development, urging institutions and the government to bridge the gap between economic growth and human well-being. Their voices expose a broader neglected rights within social institutions, where miners remain invisible despite their central role in powering the nation.

(III) Call for rehabilitation

Participants explained how they have been denied compensation aftermath of the mining accidents. Some are still fighting with the complex process and some gave up with frustration. Participants also mentioned bribery, corruption and power imbalances between the officials and miners played significant role in reaching or missing compensation. In line with these experiences, Sultan (42) reported:

> "At the beginning they said that enough economic support would be offered to the miners and their families if anyone affected while working. After the accident, they changed their voices. I went to each and every doorstep; mining officials, union leaders, political faces, government officials. Everyone showed empathy and promised to take a step. I have still got nothing. Once a leader told me that he would help me to provide the compensation money if I shared a percentage of that to him".

Miners faced accidents though got immediate treatments free of cost, the long-term medical costs were not covered by the mining company and sometimes denied. A number of individuals stated that the company either downplayed the seriousness of their injuries or denied outright that the mishaps happened at work. Faijul (34) explained:

> "They could not believe that I also got a head injury during the mining accident that damaged my visions. This was just because the problem with my eyes appeared a couple of months later after the accident. Thus, they denied to bear the medical costs. If I got proper treatment, I might be able to see you".

The study also found that the mine has an unstated and informal policy of compensating affected miners who have been injured permanently by offering the same job to their adult male child. Some has taken the risk again in extreme economic pressures while others rejected (participants' information shown in the Table 1). This reflected a pass down of

vulnerabilities over generation. Some injured miners themselves have rejoined mining without finding a better way. Those who rejected the proposal further got no economic support from the company, let alone psychosocial support. Reflecting on this experience, Sahed (43) shared as:

> "I did not have any male child. Therefore, I could not take the proposal. If I had so, I might not send him to the mine. I have seen many injured miners' children now working in the mine in their parents' place. As my legs were gone, I was no longer able to rejoin mining. They did not give anything to rehabilitate me. I got no governmental support during Covid-19 pandemic. The family struggled a lot economically. I sold the job of mine in 50000 BDT (408$) to a person from the other village".

Discussion

It is often said that 'the darkest place is under the candle'. The testimonios of the participants of this study remind us of this proverb. Before the onset of operating the mining activities at the Barapukuria Coal Mine, the local community was asked if they wanted the coal mine. At that time, they chose to have the mine since it was supposed to provide better infrastructure and employment facilities for them [54]. Who knew that this mine would produce light for others but would bring utter darkness to their lives? The adjacent community of the Barapukuria coal mine aspired to a life full of light and prosperity by working at the mine. Hence, the tragic fate of *Faijul* reflects that not all the so-called 'development' lights up everyone's life, rather extinguishes the light for some people forever. What James Ferguson (1999) and Tania Murray Li (2007) describe as the uneven distribution of risk and benefit, where marginalized workers bear the bodily costs of national progress while remaining excluded from its gains [55, 56].

This study demonstrates the profound and long-lasting human costs of mining accidents in the Barapukuria Coal Mine, exposing how neoliberal labor regimes, institutional neglect, and unsafe working conditions combine to

reproduce cycles of injury, vulnerability, and socio-economic marginalization. Through miners' testimonios, the findings illuminate how accidents are not isolated events but structural outcomes produced over time through poor safety culture, weak regulatory enforcement, and the prioritization of profit over workers' well-being. These lived experiences challenge dominant narratives that attribute accidents solely to technical failures or individual error and instead underscore the role of broader political–economic forces that shape miners' lives both inside and outside the workplace [17]. In this regard, the findings of this study reflect a broader global pattern in extractive industries, where occupational hazards are not accidental but are produced and sustained through profit-driven labor regimes and weak regulatory oversight [57].

A central contribution of this study is the application of Biological Citizenship [38, 39], through which these injuries are understood not merely as physical events but as transformative moments that reshape workers' relationships with institutions, as injured bodies become the primary basis through which claims to compensation, care, and recognition are articulated [40]. In this study, such dynamics are reflected in how injured miners' bodies become central to negotiating access to livelihoods, healthcare, and institutional support, particularly in contexts where pre-existing economic vulnerability intensifies the consequences of bodily harm. The findings further demonstrate that bodily injury not only undermines miners' capacity to work but also redefines their position within households and communities, turning them from providers into dependents, a shift that exemplifies how biological damage reshapes social and economic relations, exposing miners to marginalization and uneven institutional attention, central concerns of biological citizenship. At the same time, the findings show that access to compensation, medical treatment, and rehabilitation is highly inconsistent, as similarly injured miners receive different levels of institutional support depending on their ability to navigate bureaucratic processes, personal connections, and financial capacity, thereby reinforcing existing social and

economic inequalities [38, 39].

However, despite international frameworks such as the ILO Occupational Safety and Health Conventions (No. 155, 1981; No. 176, 1995), participants reported frequent accidents, inadequate safety equipment, limited training, and insufficient post-accident treatment and rehabilitation [58]. This persistent gap between policy and practice illustrates how structural neglect and unsafe work practices continue to expose miners to significant occupational hazards.

Similar gaps between formal labor protections and everyday practices have been widely documented in Global South contexts, where regulatory enforcement remains weak and workers' rights are often undermined by informal power structures [59].

The testimonios also reveal how mining accidents generate severe economic hardship, pushing entire households into deep precarity. Injured miners often became dependent on spouses or children, disrupting traditional gender and family roles and creating emotional and social strain within households. These economic hardships, compounded by long-term disabilities, loss of livelihood, and minimal institutional support, frequently forced families into debt, asset depletion, or migration, creating a vicious cycle of poverty. Similar patterns have been observed in prior research where mining injuries imposed economic burdens on miners' households and contributed to downward socioeconomic mobility [60].

Many participants expressed guilt for "becoming a burden," highlighting that the consequences of injury extend beyond financial loss to psychosocial suffering. These experiences also reflected a loss of self-identity and self-worth, as injured miners were constantly exposed to nightmares, depression, and guiltiness. Such patterns align with evidence showing that occupational injuries often generate long-term psychological distress and social dislocation [61, 62].

Within the framework of biological citizenship, this reflects how bodily

damage not only produces claims to rights but also reconfigures subjectivity, where individuals come to understand themselves through injury, incapacity, and dependency [38].

Moreover, participants described enduring stigma and discrimination due to their disabilities, which disrupted family dynamics, limited social engagement, and further harmed their mental health, revealing how injury reshapes their social standing and everyday interactions.

The finding that miners are renamed according to their disabilities (e.g., “lame” or “blind”) demonstrates how injured bodies become socially visible markers that redefine identity and belonging, a process also noted in studies of disability and stigma [63]

These social consequences align with critical labor scholarship, which views such institutional neglect not as isolated workplace issues but as manifestations of systemic violence embedded within neoliberal extractive industries [64, 65].

Importantly, the findings also highlight how injured miners actively attempt to claim recognition and support from institutions, including mining authorities, unions, and the state. Participants repeatedly described efforts to obtain compensation, healthcare, and rehabilitation, often navigating complex bureaucratic processes marked by corruption, delay, and denial.

This reflects the core dynamic of biological citizenship, where individuals mobilize their injured bodies as evidence to claim rights, yet frequently encounter what can be described as ‘political silence’ when institutions fail to respond [41]. Unlike contexts such as Chernobyl, where biological claims were institutionalized through state recognition, the Bangladeshi case reveals a fragmented and unequal system in which such claims remain largely unmet.

Study Limitations

This study draws on testimonios from 15 injured miners from the Barapukuria Coal Mine. Although these accounts provide in-depth insights into the lived experiences of injured miners, the actual number of miners who have experienced workplace injuries in this setting is likely to be considerably higher than those captured in this sample. In addition, the study focused primarily on severe and life-altering injuries, while many minor or less severe injuries experienced by miners were not included in the analysis. Moreover, access to official mine records and accident documentation was not available, which limited the ability to verify reported incidents or to assess the overall pattern of accidents within the mining operation. Furthermore, the study relies on self-reported testimonios, and although participants provided detailed narratives of their experiences, the possibility of recall bias cannot be excluded, as some accounts refer to events that occurred several years prior to the interviews.

Conclusion

The sufferings of injured miners not only illustrate how they face the wide-ranging and long-term challenges after being injured in a mining accident that often remains unheard, but also compel us to critically rethinking mining-led development models, that should certainly uphold occupational health and safety first, and would never be stuck in neoliberal logics. Taken together, the testimonios highlight that these findings are rooted in the workers' own experiences and expressed needs, underscoring the urgent need for a comprehensive policy response that goes beyond technical fixes. Enhanced OSH regulations, independent monitoring systems, and improved emergency response protocols are essential components of such a response. Equally important are long-term rehabilitation services, mental health support, guaranteed compensation schemes, and social protection programs for injured workers and their families. Without such measures, mining accidents will continue to reproduce cycles of suffering, invisibility, and inequality.

List of Abbreviations

ILO: International Labour Organization

OSHE: Occupational Safety, Health, and Environment

OSH: Occupational safety and health

BCM: Barapukuria Coal Mine

GSB: Geological Survey of Bangladesh

CMC: China National Machinery Import and Export Corporation

BCML: Barapukuria Coal Mining Limited

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Author contribution

Md Abdur Rashid, Dr. Tauhid Hossain Khan, Md Mridul Hossain, and Abir Mahmud developed the research concept and study design. Md Mridul Hossain, Most Suraiya Akter, and Tajnin Nahar Tonny conducted data collection. Md Abdur Rashid, Abir Mahmud, Most Suraiya Akter, and Tajnin Nahar Tonny performed data analysis and interpretation. Dr. Tauhid Hossain Khan provided critical intellectual input and supervised the study. All authors contributed to manuscript drafting and revision, approved the final version, and agreed to be accountable for the work.

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Data availability

The data generated and analyzed during the current study are not publicly available due to confidentiality and ethical considerations but are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

This study received ethics approval from Research Ethics Review Committee of the Department of Sociology, Jagannath University, Dhaka (file number:

0002A on May 7, 2025). The authors confirmed that informed consent was obtained from all participants in this research. The informed consent was verbal and was asked from each participant before the interviews started; the ethics committee approved this. The authors also confirmed that all methods were carried out in accordance with the declaration of Helsinki, which was approved by the Jagannath University Research Ethics Board. This includes the study design, data collection methods, data analysis, and the method of reporting results, maintaining the confidentiality and anonymity of the participants.

Consent for publication

Not applicable.

Conflicts of interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.