

Original Article

Structural Failures and the Normalisation of Occupational Hazard in Mumbai's Construction Sector

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Abstract - Construction workers are one of the most marginalized and vulnerable workforces in India. However, there is a lack of enforcement, a lack of documentation, and a lack of reporting of construction site safety regulations. Mumbai is one of the largest cities in the world, and its construction attracts migrants from other states. Mumbai, on account of its being a metropolitan city with continuous ongoing construction, the construction workers are exposed to a variety of safety and health risks every day, including but not limited to falling from heights, electrocution, and heat stress. There are laws such as the BOCW Act 1996 and the OSH Code 2020, but accidents occur due to unsafe practices, due to gaps in enforcement and weak accountability. Almost all the information that is available and accessible about construction workers' safety in India is quantitative and has little to no coverage of the construction workers' actual experiences. This research shows that informal labor, institutional neglect, and the normalisation of working with the risk of injury all contribute to the unsafe conditions for the construction sector in Mumbai. This is a mixed-method research that has a qualitative-dominant approach. This was accomplished by conducting semi-structured interviews, focus group discussions, and a survey with around fifteen workers and safety professionals at two construction sites in Mumbai. The primary data was supplemented with secondary sources like the National Crime Records Bureau (NCRB) and the Ministry of Labor and Employment. Findings reveal that despite basic safety equipment being available across sites, the usage of these tools is still low due to discomfort, time constraints, and compliance that is externally driven rather than embedded. Post-accident responses are limited to minimal compensation and are accompanied by little evidence of systemic improvement. This research provides an evidence-based foundation to advocate for stronger enforcement of policies and transparent reporting mechanisms, keeping in mind the diverse cultural context of the workers.

Keywords - BOCW Act, Construction safety, Migrant labour, Mumbai, Occupational hazard.

1. Introduction

The construction sector of India is one of the most dangerous occupations in India, and it poses serious risks to workers' safety and well-being (Murali et al. 2025; Tripathi et al. 2024). The sector plays a strong role in urban and economic growth but nevertheless experiences high levels of injury and fatality in the workplace ("Mumbai: Labourer Falls from Third Floor..." 2025). According to conservative national estimates, tens of thousands of construction workers die in workplace-related accidents every year (National Crime Records Bureau 2023; Murali et al. 2025; "Mumbai News: Construction Worker Dies..." 2025). Countless others suffer long-term injuries and occupational illnesses (Samanta et al. 2021). However, the number of deaths is believed to be significantly higher since the vast majority of cases are not recorded, especially in the unorganised sector, which employs most construction labour in India (Murali et al. 2025; Duddukuru et al. 2019). Accidents from height,

structural collapses, electrocution, heat-associated illnesses, and machinery-causing accidents indicate systemic failures in safety enforcement and risk management (Samanta et al. 2021; Tripathi et al. 2024). This problem is further enhanced by the absence of accountability taken by the workforce authorities (Vijayan et al. 2018). Workers are continuously exposed to preventable risks due to gaps in enforcement and monitoring by construction professionals. This ongoing exposure disrupts workplace harmony and statutory protections within construction zones.

This study takes place in Mumbai, one of India's most densely populated urban areas, and a city constantly under construction. From residential construction of high-rise towers to large infrastructure projects, Mumbai employs a huge migrant and informal construction labour workforce who are forced to work under extreme time- and spatial-constraints (Chellapa et al. 2021; Murali et al. 2025). The



construction sites in the city have already seen fatalities due to such accidents, often of workers falling or being hit by falling debris, largely because of unavailability, poor quality or non-enforcement of basic safety gear such as helmets, harnesses and scaffolding (Vijayan et al. 2018; Tripathi et al. 2024). This is not merely the failure of a technology or regulation; it is a sociological problem in which occupational risk is normalised, workers' lives are made disposable and safety breaches are seen as inevitable rather than unlawful (Geordy et al. 2018; Bhagwat et al. 2021). The invisibility of workers in official data and public discussions further worsens this problem, allowing unsafe practices to continue unchecked and without consequences (Ninan et al. 2021).

This study aims to investigate construction worker safety in Mumbai with an empirical and sociological lens. Despite growing research on construction safety in India, limited attention has been given to integrating workers' lived experiences, enforcement gaps, managerial perspectives, and contemporary field-based evidence into a single empirical investigation, particularly within Mumbai's construction sector. The four main objectives of this are to:

- Analyse publicly available data on construction accidents, injuries, and fatalities in Mumbai to identify patterns of occupational risk
- Document experiences of workers' exposure to physical danger and access to safety gear
- Determine the nature, reliability and limits of available accident and safety information
- Assess enforcement gaps despite the existence of laws such as the Building and Other Construction Workers (BOCW) Act

Overall, these goals are intended to analyse one-off events that may occur in bigger construction sites, and also to reveal structural failings that cause unsafe construction sites and dangerous working conditions for workers. The structure of the paper comprises the literature review, which examines construction safety in India. This section highlights sociocultural perceptions of risk, access to protective equipment, unavailability of data, lack of enforcement and normalisation of occupational harm. The methodology section outlines the study's mixed method approach, including quantitative and qualitative data that have been triangulated and analysed against official reports. This text is about safety measures at construction sites.

This will help in highlighting the major findings about safety issues and practices on construction sites. The findings in the discussion section of this paper reveal how institutional neglect, lack of formal accountability mechanisms, and cultural attitudes toward informal labor contribute to unsafe working environments in Mumbai's construction industry. The conclusion draws together the major findings and presents evidence of systematic violation

of the rights of construction workers and legislation. The appendix elaborates on existing legislation and acts decided by the Indian government.

2. Literature Review

Globally, approximately 2.3 million employees die annually from work-related accidents and diseases, with the fatality rate increasing by 15% to 19% over the last five years (Tripathi et al. 2024). In India, the construction sector employs about 7.4% of the global workforce, resulting in 51 million jobs contributing 9% to the GDP; however, it also amounts to 16.4% of all workplace fatalities (Murali et al. 2025; Tripathi et al. 2024). Falls from height are the most lethal, accounting for 46% of all fatal incidents; other major risks include being struck by objects, electrical hazards, and fire (Tripathi et al. 2024). Studies estimate that the industry experiences around 38 fatal accidents daily in India (Murali et al. 2025), highlighting the urgent need for improved safety mechanisms.

Based on a bibliometric analysis of 64 journal articles, research on Construction Worker Health and Safety (CWHs) only gained momentum post-2013 (Chellappa et al. 2025). Most investigations were centred around the issues related to Musculoskeletal Disorders (MSDs), safety management systems, safety climate and culture, Information and Communication Technologies (ICT), and hazard recognition and risk mitigation. However, these studies have been mostly related to observational frameworks, and although they proposed broad guidelines on actionables, a well-guided action-oriented solution with demonstrable outputs has been lacking (Murali et al. 2025).

Studies within the MSD cluster highlight the physical strain associated with construction tasks such as manual material handling, plastering, granite cutting, and reinforcement work (Samanta et al. 2021; Singh et al. 2024; Chellappa et al. 2025). Researchers have employed ergonomic assessment tools such as Rapid Entire Body Assessment (REBA), Rapid Upper Limb Assessment (RULA), Electromyography (EMG), and the Nordic Musculoskeletal Questionnaire to evaluate workers' vulnerability to such injuries (Chellappa et al. 2025). There was also an attempt to develop a score to determine the maximum load limit for manual lifting for Indian adult female construction workers (Chellappa et al. 2025).

Another major theme within the literature is safety management and organisational culture. Several studies emphasise the role of management commitment, training, and safety programs in improving safety outcomes (Sivaprakash et al. 2018; Chellappa et al. 2025). Projects that incorporate safety incentive and penalty provisions performed better in terms of accident frequency, severity, and incidence rates compared to projects without such mechanisms (Hasan et al. 2013). The authors found that

developing the right attitude towards safety, employing skilled labour for specialised tasks, and delivering instructions in workers' native languages significantly alleviated the workplace safety performance (Chellappa et al. 2021; Hasan et al. 2013).

The safety culture within organisations also reveals significant perception gaps across hierarchical levels. The managers of the organizations often rate safety adherence much higher than actual ground staff (Bhagwat et al. 2021). Managerial assessments, therefore, do not accurately reflect the safety experiences of on-ground workers. Some of the main reasons for these discrepancies include inadequate financial commitment to safety, limited worker involvement in safety planning, poor communication of safety policies, and the absence of systematic monitoring frameworks such as the Plan-Do-Check-Act cycle (Bhagwat et al. 2021).

The challenges faced by migrant workers who constitute a substantial portion of the workforce also contribute towards the role and relevance of construction safety in India (Chellappa et al. 2021). The estimated migrant workforce in India has increased from 30 million in 2009–2010 to 58 million by 2017–2018, as per data from the Ministry of Labour and Employment. Many of these workers originate from states such as Bihar, Uttar Pradesh, Odisha, and West Bengal and migrate to urban centres, including Mumbai, Chennai, and Bengaluru (Chellappa et al. 2021); however, they experience linguistic differences, which create communication barriers that hinder effective safety training and compliance (Chellappa et al. 2021; Hasan et al. 2013).

An additional limitation identified during the literature review is the relative lack of recent empirical research on construction worker health and safety in India. Although some recent reviews have synthesised existing evidence (Chellappa et al. 2025; Murali et al. 2025), many frequently cited primary studies on safety culture, management practices, and regulatory compliance were published over a decade ago (Hasan et al. 2013; Sivaprakash et al. 2018; Vijayan et al. 2018). This highlights the need for updated field-based research that reflects the contemporary workplace environment. This study does this by using recent primary data.

The government is designing more initiatives to strengthen the implementation of construction worker welfare and safety regulations. The Building and Other Construction Workers (BOCW) Act, 1996, and the Occupational Safety, Health and Working Conditions (OSH) Code, 2020, along with the Ministry of Labour and Employment's initiatives, improve monitoring and welfare delivery. In 2024, the Ministry launched the BOCW Management Information System (MIS) Portal to centralise worker registration, monitor utilisation of welfare funds, and integrate State Building and Other Construction Workers

Welfare Boards with the e-Shram database. As of June 2024, approximately 5.7 crore construction workers had been registered with State Welfare Boards, over ₹1.15 lakh crore had been collected through the BOCW welfare cess, and more than ₹66,000 crore had been utilised for worker welfare schemes (Ministry of Labour and Employment 2024). The Ministry has also encouraged States and Union Territories to accelerate integration with the e-Shram portal to improve access to health insurance, social security, and other welfare benefits. Despite these recent administrative reforms, parliamentary discussions continue to highlight gaps in implementation, particularly regarding uneven utilisation of cess funds and the effectiveness of welfare delivery across states, suggesting that strengthening enforcement remains a key policy challenge.

Despite these initiatives, the Ministry of Labour and Employment informed Parliament in 2023 that construction accidents continue to occur across the country, reinforcing concerns that stronger enforcement and implementation remain necessary (Ministry of Labour and Employment 2023). In light of the literature review, it is evident that several gap areas persist in CWHS research and policy work. Firstly, most of the research has focused on observational work identifying risks, ergonomic stressors, and cultural deficiencies; however, action-oriented interventions with measurable real-world impact are lacking. Second, studies have proposed frameworks for safety management and highlighted the importance of training, communication, and organisational commitment, but there is a lack of integrated systems that simultaneously address behavioural, technological, and contextual challenges in resource-constrained situations and small-scale unorganised sectors. Third, the gap between managerial perceptions and on-ground realities has been identified, but effective measures to bridge this gap have not been proposed. Finally, although advancements in ICT have been discussed, their practical deployment in low-literacy, high-risk settings remains underexplored.

3. Methodology

Using a qualitative-dominant mixed-methods approach, this study combines descriptive analysis of secondary data with in-depth qualitative primary investigation. The phenomenological approach, which focuses on comprehending how people experience and interpret a phenomenon in their daily lives, forms the foundation of the primary data portion of this study (Flick 2014). For this study, work-site safety is understood to be a phenomenon that is lived, structurally constructed, and shaped through precarity, subcontracting processes, weak enforcement, and asymmetrical power relations at work-sites. Through the mix-methods approach, this study is able to understand how workers understand and negotiate risk within their everyday life practices.

In order to ensure ethically sound participation of participants (given that the researcher is a high school student from Mumbai), the research takes place in Mumbai, with fieldwork being carried out at two sites. The chosen methodology retains viability and the ability to protect participants, and the focused site approach allows for an insight into the practice of safety and interactions therein. Some of the national and local secondary data sources utilized in this study include the National Crime Records Bureau (NCRB), the Labour Bureau, the Ministry of Labour and Employment, and the civil society organizations.

A total of sixteen participants filled in the structured questionnaire, while others were involved through focus groups to collect the experiences and perceptions of employees on workplace safety issues. Three semi-structured interviews were also carried out to collect the individual stories and organizational perspective. The research participants were selected based on varying degrees of experience, exposure to workplace hazards and types of task roles (manual workers, scaffold workers, machine operators, etc.). Employees who have either been involved in accidents or witnessed them are prioritized for interviewing because their testimony is critical in understanding the safety mishaps.

Organizational perspectives are provided by safety engineers and the heads of the major construction companies. Given the qualitative-dominant design, two sites, sixteen survey respondents, three interviews, and focus group discussions were considered sufficient as the study prioritises depth and triangulation across a small, purposively chosen set of roles (manual workers, scaffold workers, machine operators, safety heads) over statistical generalisation. The research uses purposive sampling and snowball sampling to access the participants. The purposive sampling (or criterion-based sampling) involves deliberate selection of participants who meet certain criteria for the research (Flick 2014). In the current study, the participants are the employees who are currently working at the chosen locations and are exposed to workplace hazards. This ensures that the data collected is relevant to the research aims. Participants were required to be actively employed at one of the selected sites and willing to discuss workplace safety based on personal experience or observation. Administrative staff without site responsibilities and individuals unwilling to provide consent were excluded. By asking initial respondents to recommend other employees who might be willing to participate, especially those who have experienced or witnessed accidents, snowball sampling is then used to collect more direct and impactful data (Flick 2014). This strategy becomes important where direct access is hard to get because of informal employment, lack of trust or fear of reprisals. Initial contact was facilitated through the site safety heads, who introduced the study to workers. Participation was entirely voluntary, and workers opted in after the study was explained.

Table 1. Participant characteristics

	Survey (16)	Interview (3)	Focus group*
Gender	All participants were male because the sampled roles (manual workers, scaffold workers, machine operators, and site safety personnel) at the selected construction sites were occupied exclusively by men during the fieldwork.		
Age range	50%: 18-25 yrs 37.5%: 26-35 yrs 12.5%: 36-45 yrs	1 was between 26-35, and 2 were between 36-45.	-
Years of experience	1-25 years	18-24 years	5-10 years
Primary role	Manual workers, scaffold workers, machine operators	Safety engineer, project head, etc.	Manual workers
* Focus group participants were drawn from the survey participants and are therefore not reported separately.			

The two main data collection methods used are semi-structured interviews and survey-based data collection. Focus group discussions were also conducted as a complementary method to explore group dynamics, shared safety practices, and common perceptions among workers. The focus group discussion was particularly helpful to understand the risk normalisation by the workers and their on-site behaviour. The purpose of the survey is to collect standardised, comparable data on workers' experiences with risk, reporting behaviors, awareness of safety procedures, and access to safety equipment. The interviews helped with understanding the management's perception and perspective of workplace safety. Data collection was carried out over the course of three weeks.

The structured questionnaire comprised 21 questions, primarily multiple-choice with a small number of open-ended items. The semi-structured interview guide consisted of 10-12 open-ended questions and was conducted on-site, allowing participants to elaborate on their experiences and perceptions of workplace safety. The process struck a balance between the practical and ethical limitations of field access and the requirement for adequate engagement. The questionnaire was administered in person using a paper-based format and conducted primarily in Hindi, with clarification provided where required. The results were then manually entered by the researcher on Google Forms for easy data visualisation and record-keeping.

The study uses descriptive analysis for quantitative data and thematic analysis for qualitative data. The process of finding, examining, and interpreting recurrent patterns (themes) in qualitative data is known as thematic analysis (Flick 2014). Key themes, including the lack or poor quality of safety equipment, underreporting of accidents, job insecurity, lack of training, and the normalisation of occupational risk, are extracted from interview transcripts and open-ended survey responses. Both overt narratives and underlying structural patterns can be found using this method.

The recurring frequencies of workers' opinions on workplace safety and challenges constitute the quantitative data. Given the small survey sample ($n = 16$), quantitative findings are presented descriptively using frequencies and percentages rather than inferential statistical tests, as the objective was to complement the qualitative findings rather than achieve statistical generalisation. Triangulation, which compares and integrates various data sources and techniques to improve validity, is a significant methodological component of this research. The study aims to find differences between reported safety conditions and on-ground realities by comparing official statistics with workers' lived experiences and management's claims, particularly when it comes to underreporting and informal labor practices.

Given the socio-legal relevance of the research, the study follows certain documentation practices, including maintaining audio recordings of data collection and analysis, archiving secondary data sources with retrieval dates, and ensuring transparency in methodological decisions. To protect participant identities, consent records were stored separately and safely on the cloud data storage. Before each interview began, participants provided oral consent, including permission to record the conversation. The research has been supervised by a doctoral researcher trained in Sociology, with ten years of global experience in qualitative research. Confidentiality is ensured through rigorous de-identification procedures, which include the use of pseudonyms, removal of site-specific identifiers, and reporting of findings only in aggregated or non-identifiable formats. All data is stored securely, with access restricted to the researcher.

4. Discussion

4.1. Structural Safety Systems and Their Gaps

The findings of this study suggest that the effectiveness of the proposed safety measures varies across different construction sites in Mumbai despite the claims and their presence in the paper. Instead of being inherently integrated into the system, safety comes across as functioning via enforcement or supervision (like by governmental bodies), which becomes a form of external control that clearly reflects organisational priorities.

4.1.1. Organisational Safety Measures

The results of both interviews and surveys reveal that the provision of basic safety equipment (helmets, safety shoes, jackets, etc.) is mandatory for any site. According to the Project Head at a reputable construction company,

“Basic for workmen - jacket, safety shoes, helmet. Every company needs to have these. There are different kinds of shoes depending on the level of risk, gloves for welding work, face and eye protection... all of this is expected on site.”

This is confirmed by the findings from the survey, where 100% of participants noted the provision of helmets and safety gear at their sites. Nevertheless, it was found that mere availability does not mean that this equipment is used properly. In addition, all the workers interviewed noted that they do not have an opportunity to keep their helmets with them, which means that access to this equipment is not provided freely but is controlled. Restricted access reduces the regularity of helmet use, especially in conditions that are less supervised (where most accidents usually occur).

Similar is the case with the 50% of respondents claimed having access to harnesses, ropes, and pulleys, but only 31.3% reported having access to basic first aid kits, which suggests that there is an unequal distribution of safety equipment beyond the minimum safety requirements. All of these safety facilities are stated to be mandatory in the booklet issued by the Government of India (DGFASLI n.d.) for construction workers.

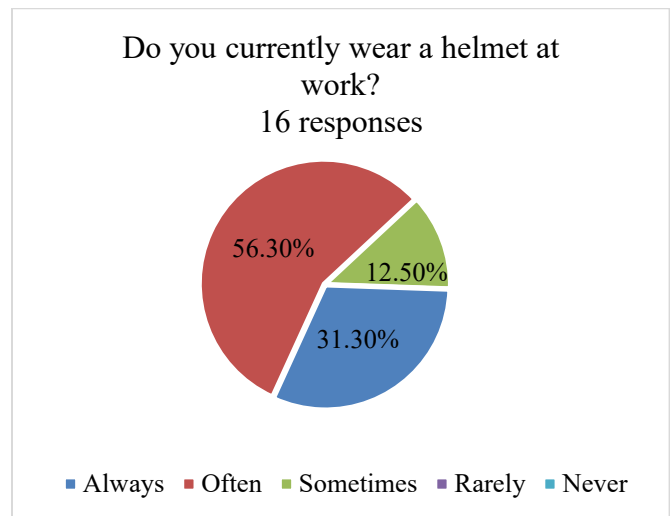


Fig. 1 Wearing a helmet at the workplace

Inconsistency in welfare facilities is another thing that was pointed out. Around 62.5% workers said that they have access to running water or toilets, but 37.5% workers said that this access was irregular. This is similar to the general trend (discussed informally during field interactions): larger

and organized construction sites provide such facilities, but smaller sites do not.

A second example of the training practice given to the workers brings to light the structural weaknesses. Though 93.8% of the respondents stated that they have had some training, it was also pointed out during interviews that these trainings are usually restricted to induction and also happen periodically. As revealed by the interview with the safety head of the organization,

"We do safety induction for the staff. Safety week is going on currently. It is to create awareness about what safety should be. The bar is getting raised slowly."

However, there is no indication of any mechanisms for continuous or repetitive training, as can be seen from the survey findings. So, as far as the issue of turnover and the migratory nature of the workers is concerned, the one-time awareness campaign might not be effective enough for making sustainable changes in behaviour.

Monitoring, Audit, and Preventive Mechanisms

As can be seen from the interviews carried out, the monitoring and preventive measures are quite well developed at organized construction sites. Some of the measures include AQI monitoring, dust suppression (through sprinklers, etc.), and safety audits. From the interviews of some of the construction workers carried out during the focus group discussion,

"Water sprinklers are used at 9 am, 12 pm, 4 pm and 6 pm for dust control. Monthly checking is done for earthing values. Machines have safety precautions, and if there is a deviation, they stop automatically."

These measures indicate an increasing shift towards preventive safety. However, their implementation is hard to scale because of some limitations. The safety head said,

"It is difficult to monitor 250-300 labour at a time. Basement mein kya ho raha hai... jab tak main jaoonga, kya lapse ho gaya, mujhe nahi pata." [I will not know if there has been an accident in the basement until I go there]

This leads to loopholes within which hazardous activities can go unnoticed (this includes practices like improper scaffolding, lack of usage of the harness, etc). Furthermore, enforcement of the regulations is very important when it comes to ensuring compliance with the rules. According to the head of the project,

"MCGM checks everything - AQI, debris management, sprinklers... they will give notice if compliance is not there."

Both of these people (both have high positions in the management structure) realized that these systems could be circumvented in the absence of proper enforcement. As a result, an atmosphere in which safety is only temporary is created.

Safety Measures for the Environment and Occupation

This survey revealed that the main environmental hazards faced by employees include exposure to dust and heat. Many employees are affected by these factors, as 62.5% of the employees mentioned that heat is a major hazard at work. Some measures that have been taken, according to the survey and interviews, include the use of water sprinklers and dust collectors. However, their effectiveness will depend a lot on their consistent application. As stated by the project head,

"We are using self-dust-collecting grinders... and monitoring AQI as per MCGM requirements."

Similarly, the dangers associated with heat hazards have not been given their due attention. In contrast to dust control measures, there are no specific intervention strategies concerning the heat hazard, even though it has direct impacts on workers' well-being and performance. Dust and particulate matter exposure have become normalised. This was seen from the workers' perspectives during fieldwork when it was considered routine rather than an exception.

4.2. Accountability, Reporting, and On-Ground Reality

Another important element is the stark contrast between accountability and the reality of accident reporting and management.

Accountability Around Accidents

From the management perspective, accidents are generally viewed as avoidable. As stated by the safety head,

"Accidents happen because of a lack of plan. Every accident is avoidable. When we go to the root cause, it is because something or someone didn't do something correctly... some checking or cross-checking was missed."

He further emphasised:

"Accidents happen when someone takes a shortcut... any deviation from SOP [standard operating procedure] can result in an accident."

As is also highlighted in the secondary sources in the literature review and the appendix, it is the developers, contractors, and the project managers who are responsible for the accident. However, according to the management, the main responsibility for dealing with the consequences falls on the contractor,

"The contractor is supposed to handle it... Until compensation happens, the builder holds the contractor responsible."

Despite this, there is hardly any compensation. As highlighted by the project head,

“The worker’s family... gets a very small amount, like Rs 2 lakhs for compensation.”

As observed from the analysis of primary and secondary information, there is a huge disparity between formal accountability systems and workers’ safety because in many cases, the death or injury of a worker can deprive an entire family of their primary, and most of the time, only source of income.

Critical Review of Safety Systems and On-Ground Reality

Though there are systems to ensure worker safety, there are differences in the adoption of these systems across different work-sites. As mentioned earlier, the organised work-sites have higher adoption rates while unorganised sites lack even the basics of safety measures. According to the project head,

“Unorganised sites will not even have a gate. Everything is disorganised... safety is nothing for them.”

Further, he said that such safety systems are easily bypassed, especially when time or pressure is involved. In situations where inspections are done by government authorities, one common perception shared in the interview was that,

“Everything in India is manageable.”

This shows the cultural tendency in India where rules can be negotiated depending upon the urgency and cost involved.

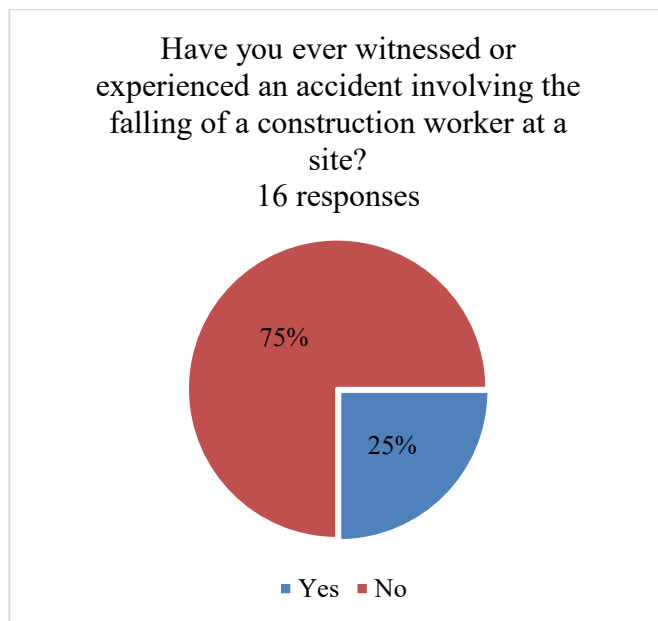


Fig. 2 Witnessing an accident at the workplace

Further evidence from surveys also supports the findings. Despite the presence of systems, 75% of workers interviewed had never seen any falling accidents occur. This may reflect either under-reporting or poor awareness about the accidents, other than what is happening right in front.

This finding confirms the managerial perception gap identified (Bhagwat et al. 2021), which reported that managers consistently rate safety adherence more positively than on-ground workers. While their conclusions were based on a large organisational survey, the present study extends this evidence through qualitative interviews and field observations in Mumbai, demonstrating how this disconnect is reflected in everyday safety practices and workers’ lived experiences.

Responses on procedure in cases of emergencies indicate that immediate help is usually provided by co-workers or supervisors instead of through the formal emergency system(s), suggesting that real-time response mechanisms become informal.

Post-Accident Analysis

Post-accident processes are largely procedural and reactive. As described by one of the interviewees,

“After an accident happens, it is only damage handling... You have to take care of the person and the reputation of the company.”

Formal processes such as police documentation (panchnama) are followed, but these occur after harm has already taken place. There is limited evidence of systematic feedback where accident analysis leads to structural improvements. Instead, the focus remains on legal compliance and compensation, rather than prevention of recurrence.

4.3. Workforce Experience, Risk Normalisation, and Safety Culture

4.3.1. Workforce Behaviour and Safety Culture

Survey findings show that only 31.3% of workers reported always wearing a helmet, while 56.3% reported wearing it only sometimes, despite universal availability.

The reasons for inconsistent usage are clearly reflected in the data:

These responses, including the helmet being uncomfortable (54.5%), too hot (63.6%), hard to breathe in (18.2%), among others, indicate that non-compliance is not due to lack of access, but due to usability and working conditions. Also to note, the question presented in Figure 3 was answered only by respondents who did not report always wearing a helmet (n = 11), explaining the smaller number of responses.

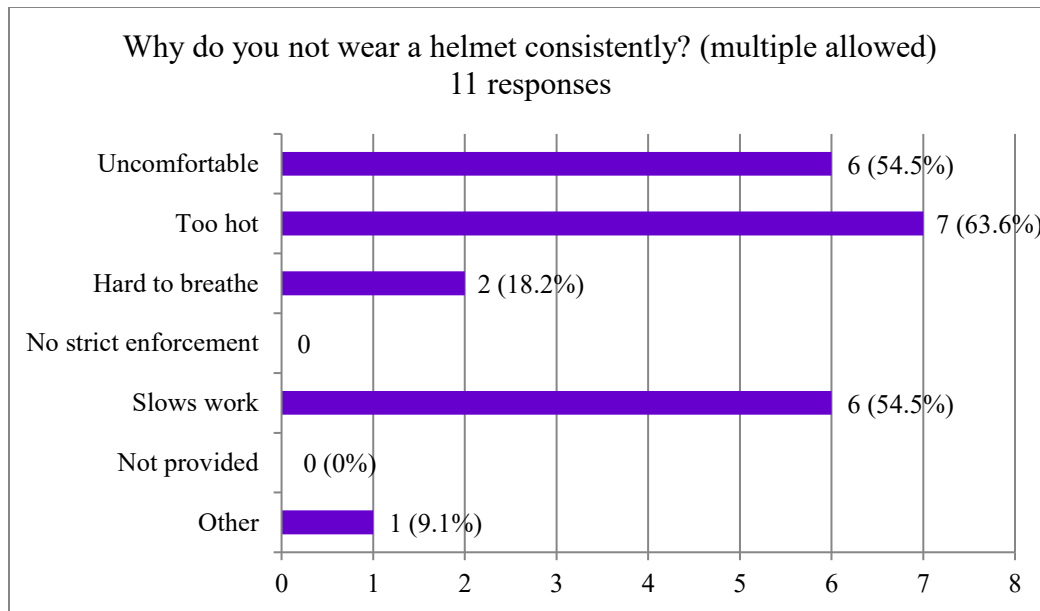


Fig. 3 Reasons for irregular helmet wearing

Interview insights elucidate that compliance is externally driven. Workers tend to follow safety protocols when monitored, but are likely to bypass them otherwise. When investigating further during the conversations with the key informants, it was found that risk is normalised as part of everyday work. This is not framed as negligence but as inevitability. Workers operate within constraints where speed, output, and income often take priority over safety. Time pressure plays a significant role here. As highlighted in interviews by the project head,

“You bypass something as you need to go home early... that might result in an accident.”

Furthermore, the diversity of migrants in the workforce creates more challenges. As was mentioned during the focus group discussion, workers belong to different linguistic and regional communities, which influences communication and the effectiveness of training and compliance. According to some workers, misunderstanding may occur due to cultural differences related to the working style and modes of instruction.

In summary, despite the fact that there is some safety in the construction sector in Mumbai, there are still significant inconsistencies that differ based on context, something that broad regulations do not account for. There are systems, regulations, and technologies, especially within organised construction sites. However, their effectiveness is affected by the issues related to enforcement, economic conditions, and behaviour patterns. Such problems may create problems for effective safety and cause ineffective systems depending on the type of work site, degree of supervision, and personal circumstances of workers.

This shows us, once again, that the core argument of this research is more complicated and can't be understood in a generalised way. This problem is connected with organisational practices, working conditions, and socio-economic contexts. Addressing this problem requires good communication, transparency, and constant check-ups across levels.

5. Conclusion

This paper shows that construction workers' safety in Mumbai is significantly dependent on policy enforcement, cost-cutting pressures, and organisational practices rather than guaranteed protections by the government bodies. By combining academic arguments with primary insights from workers and industry professionals, the research addresses its core objectives by identifying patterns of occupational risk, documenting lived experiences of safety and exposure, and critically evaluating the reliability of the reported safety data.

The findings reveal a significant disconnect between policy, practice and execution. Compliance is often externally driven and dependent on organizational practices rather than embedded within everyday professional ethos. This reinforces the argument that safety failures are not isolated incidents, but outcomes of systemic conditions, including informal labour structures, weak accountability, and the normalisation of risk by both the workers and the management.

This study also has some limitations. The research is based on field studies of limited sites (two sites), which may not fully capture the diversity of construction environments across Mumbai or other cities. The narrow sample size, while providing valuable insights and narratives, may limit the

generalisability of findings. Additionally, reliance on self-reported data introduces the possibility of recall bias and response bias. Workers may have underreported unsafe practices, near misses, or criticism of site safety, particularly when interviews and surveys were conducted through management-linked contacts or in the presence of supervisors, despite efforts to ensure voluntary participation and confidentiality. Constraints related to time, access, and administrative permissions further restricted prolonged observation and longitudinal analysis of safety practices. Despite these limitations, the use of triangulation strengthens the validity of the findings. Workers' testimonies are aligned with secondary data and institutional perspectives to present a holistic understanding of the safety issues.

Future research can build on this study by expanding to multiple sites in Maharashtra and the rest of the country. Longitudinal tracking of safety practices and targeted interventions can be incorporated to address both behavioural and structural dimensions of safety. There is a particular scope for developing integrated systems that combine technology-enabled monitoring, worker-centric design of safety equipment, and multilingual, continuous training models suited to informal and migrant labour contexts. One promising avenue would be to evaluate the effectiveness of a multilingual safety-training programme specific to migrant construction workers. A quasi-experimental or pre-test/post-test study could assess whether multilingual training

improves safety knowledge, PPE compliance, hazard reporting, and workers' perceptions of workplace safety over time. At the policy level, the findings highlight the need for stronger enforcement mechanisms, transparent reporting systems, and accountability frameworks that move beyond post-accident compensation towards prevention. Overall, this research provides an evidence-based foundation for advancing both academic inquiry and civic inquiry aimed at strengthening construction worker safety in Mumbai.

Author Contribution Statement

The author, Navya Agarwal, came up with the research question and study design. She has conducted the literature review and collected all primary data through semi-structured interviews, focus group discussions, and a structured survey at two Mumbai construction sites. Navya performed thematic analysis of qualitative data and descriptive analysis of quantitative data, and has triangulated primary findings with secondary data from national sources, including the NCRB and Ministry of Labour and Employment. Navya has written the manuscript in its entirety.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this paper.

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Appendix 1

There are already some laws and acts in place in India, set by the government, which are followed by construction companies and building agencies nationally.

The Building & Construction Workers Act, 1996

Worker Safety

If a construction site employs 500+ workers, the employer must form a Safety Committee where workers have at least equal (or more) representation than management. A qualified Safety Officer must also be appointed.

Accident Reporting

Any accident causing death or preventing someone from working for 48+ hours must be reported to the authorities. If 5 or more people die in one accident, an inquiry must happen within a month.

Employer Responsibilities

- Ensure constant safety supervision on site
- Pay wages on time
- If a contractor fails to compensate an injured/deceased worker, the employer must pay first and recover the money from the contractor later

- Give at least 30 days' written notice before starting construction

Penalties for Violations

Breaking safety rules can lead to up to 3 months in jail and/or a ₹2,000 fine. Repeat offenders face up to 6 months imprisonment and a minimum ₹500 fine.

In short, this law ensures construction workers are protected, fairly paid, and that employers are held accountable for safety.

The Buildings and Other Construction Workers (Regulation of Employment and Conditions of Service) Kerala Rules, 1998

This Act implements the central 1996 Act, regulating safety, health, and welfare for construction workers in Kerala. They mandate employer registration, welfare fund contributions, and safety protocols. Recent amendments (2024) note that if a beneficiary defaults on contributions for over three years, membership cannot be resumed.

Key Aspects of the 1998 Kerala Rules:

- Registration: Mandatory for establishments, including reporting commencement and completion of work.

- Welfare Board: Establishments must register with the Kerala Building and Other Construction Workers' Welfare Board, CAG.
- Safety and Health: Rules outline necessary safety gear, health facilities, and, in some cases, accommodation for workers.
- Cess Collection: Rules for levying and collecting a 1% cess on construction costs to fund the welfare board.

Amendments

The rules are subject to updates, with a 2024 amendment modifying rules related to membership resumption after payment defaults.

The Inter-State Migrant Workmen Act, 1979

This Act is primarily focused on employment regulation, wages, and the welfare of migrant workers rather than occupational safety. Any establishment or contractor employing 5 or more interstate migrant workers is covered under this Act.

- Registration & Licensing - Employers must register their establishments with the appropriate government authority. Contractors must obtain a licence before recruiting or deploying migrant workers across states. Licences can be revoked if conditions are violated.
- Worker Entitlements - Migrant workers are entitled to equal pay for equal work, and wages must never fall below the minimum wage. They also receive a displacement allowance (50% of monthly wages or ₹75, whichever is higher) at the time of recruitment, and a journey allowance covering travel costs both ways, with wages paid during travel.
- Employer & Contractor Duties - Contractors must issue a passbook to every worker, provide free medical facilities, suitable housing, and protective clothing. If a contractor defaults on wages or allowances, the principal employer becomes liable to pay and can later recover the amount from the contractor. Any loans given to workers must be cleared before their employment ends.
- Dispute Resolution - Workers can raise industrial disputes either in the state where they work or the state where they were recruited, especially after returning home.
- Penalties - Violations attract imprisonment up to 1–2 years and/or fines. Obstructing inspectors is also a punishable offence.

Indirectly Coverage of the Safety Angle

- Contractors must provide suitable conditions of work, considering that workers are operating in a state different from their own (Section 16c)
- Medical facilities must be provided free of charge to workers (Section 16e)
- Protective clothing must be provided as prescribed (Section 16f)

- In case of fatal accident or serious bodily injury, the contractor must report it to authorities in both states and inform the worker's next of kin (Section 16g)

The Occupational Safety, Health and Working Conditions (OSH) Code, 2020

This code consolidates 13 central labour laws into a single framework to regulate safety, health, and the work environment for employees in India. Key features include mandatory registration for establishments with 10+ workers, uniform working hours (max 8-12 hours/day), expanded women's employment rights in night shifts, and specific provisions for gig/platform workers and inter-state migrants.

Key Features and Aspects of the OSH Code 2020: Consolidation

The code replaces 13 major labor acts, including the Factories Act 1948, Mines Act 1952, and Contract Labour Act 1970.

Applicability

Applies to all factories, mines, dock work, building/construction, and establishments with 10 or more employees.

Working Conditions

- Hours: Maximum daily working hours are limited to 8-12 hours, with mandatory overtime pay at twice the rate of wages for work beyond 8 hours a day or 48 hours a week.
- Women Employees: Women are permitted to work in all establishments for all types of work, including night shifts (7 pm to 6 am), provided they consent, and employers ensure safety, security, and transportation.
- Facilities: Mandatory provision of hygienic working environments, including separate toilets, urinals, and washing areas for men, women, and transgenders.

Employer Responsibilities

- Safety Standards: Employers must provide a hazard-free workplace, necessary personal protective equipment (PPE), and free annual health check-ups for employees in certain establishments.
- Registration: A single electronic registration is required for establishments.
- Gig and Contract Workers: The Code introduces regulations for gig workers, platform workers, and inter-state migrant workers, enabling government-funded social security schemes.
- Health and Safety Committees: Mandatory for establishments with 500 or more workers to ensure employee participation in safety management.

The Code aims to simplify compliance, enhance worker safety, and streamline administrative procedures.