International Journal of Multidisciplinary Sciences and Arts
E-ISSN :2962-1658
Volume 4, Number 2, April 2025
https://doi.org/10.47709/ijmdsa.v4i2.6200

# Unsafe Actions for Occupational Accidents in Construction Workers: A Systematic Literature Review

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**Article History:**
Submitted: 21-06-2025
Accepted: 06-07-2025
**Published: 11-07-2025**

**Keywords:**
Unsafe actions; construction; knowledge; use of PPE; supervisor.

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**ABSTRACT**

The sector with a high accident rate in Indonesia is the trade and services sector (21.4%), which in this case includes construction. 32% of work accident cases that occurred in Indonesia throughout 2017 were work accidents in the construction sector. It is stated that 88% of work accidents occur due to unsafe actions so it is necessary to conduct research regarding factors related to unsafe actions on work accidents in construction workers. This research uses Systematic Review and PRISMA. The data was obtained from related research that has been collected by the author. A total of 8 journals were used in this research. Knowledge, use of PPE, and supervision are related to unsafe actions towards work accidents in construction workers. It is necessary to provide training and education to increase workers' insight into Occupational Health and Safety knowledge, procedures for using tools and PPE so that workers are able to map the dangers and risks in their work and work environment. It is necessary to create rules/policies and a commitment from supervisors and management to take firm action against workers who violate rules such as not using PPE in the form of punishment.

## INTRODUCTION

Infrastructure development in Indonesia is increasingly experiencing growth. The numerous projects from the public and private sectors, or a combination of both, create business opportunities as the main and strategic drivers for economic growth and the advancement of the construction industry, while also posing challenges for society, especially for business operators in the construction services sector such as consultants, contractors, and service providers. However, without realizing it, there is a significant potential for danger in building construction projects that can result in work accidents and occupational diseases. The increase in construction accidents that occurred at the end of 2017 and the beginning of 2018 marked a significant change in construction safety in Indonesia (Kemnaker RI, 2022).

Global data from the International Labour Organization (ILO) indicates that there are 430 million cases of work-related accidents and diseases worldwide each year, of which 270 million (62.8%) are work-related accidents and 160 million (37.2%) are work-related diseases. Every day, around 860,000 workers experience work-related accidents and occupational diseases worldwide, and 6,400 workers die due to work-related accidents and occupational diseases (ILO, 2013; Kemnaker RI, 2022).

The Social Security Agency for Employment (BPJS Ketenagakerjaan) reported that from 2019 to 2021 in Indonesia, there were recorded 210,789 people (4,007 deaths), 221,740 people (3,410 deaths), and 234,370 people (6,552 deaths) as victims of workplace accidents out of a total of 30.66 million workers (participants in the BPJS Ketenagakerjaan program), from a total of 126.51 million workers in Indonesia (Syahputra, 2022). There are 180,000 work accidents with a recovery rate of 26%, a disability rate of 3%, and a mortality rate of 3% among the total of 35.2 million workers in Indonesia (Kemnaker RI, 2022). This data shows that the rate of workplace accidents in Indonesia is still high. Based on the data, the sector with the highest accident rate in Indonesia is the trade and services sector (21.4%), with 32% of work accident cases occurring in Indonesia throughout 2017 being construction work accidents (Kemnaker RI, 2022). Construction work has a high risk of accidents, ranging from minor accidents to major (fatal) accidents that result in death or permanent partial disability. Fatal accidents occur when a construction worker falls from a height, is struck, falls, or is struck by moving objects or machinery (Noor, 2018).

Unsafe action is the biggest factor that causes workers to experience accidents while working. Henrich (1980) mentioned that 88% of workplace accidents occur due to unsafe actions such as not wearing personal protective equipment (PPE), not following work procedures, not adhering to safety regulations, and working carelessly, while 10% are due to unsafe conditions and environments, and the remaining 2% are unforeseen (Ernyasih, 2021).

## LITERATURE REVIEW

The research conducted by Akbar (2021) found that workers did not use PPE correctly, such as not using body harnesses when working at heights and not using hand protection when using cutting machines, lifting loads with incorrect methods, and chatting and joking while working at the workplace. These unsafe actions were contributing factors to minor accidents, amounting to 3-8 accidents each month throughout 2020, which occurred due to workers

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E-ISSN :2962-1658
Volume 4, Number 2, April 2025
https://doi.org/10.47709/ijmdsa.v4i2.6200

engaging in unsafe behaviors such as human error (Akbar, 2021). Yaqub's (2022) research found that there is a relationship between supervision and unsafe actions among construction workers at the Raudah Hospital Makassar project because supervision during work was not carried out properly, leading workers to engage in unsafe actions while working (Yaqub, 2022). Panjaitan's (2019) research found that there is a relationship between the use of personal protective equipment (PPE) and workplace accidents among workers at PT. DAP Perumahan Citra Land Bagya City, Medan City. Most construction workers do not use personal protective equipment (PPE), including safety helmets, masks, non-standard work clothing, protective eyewear, boots/safety shoes, and many even wear flip-flops (Panjaitan, 2019). Supported by Handari's research (2021), it was found that 74.5% of workers experienced work accidents, indicating a significant relationship between the completeness of PPE and knowledge with work accident occurrences among workers at PT. X Serpong-Cinere Toll Road Project in 2019 (Handari, 2021). It can be concluded that unsafe actions are largely influenced by knowledge, compliance with the use of PPE, and the role of supervisors. Based on the above description, it is concluded that the purpose of writing this article is to review the literature on factors that influence construction workers to engage in unsafe actions leading to work accidents.

## METHOD

Factors that influence construction workers to engage in unsafe actions leading to workplace accidents. This study uses a systematic review design through international and national databases from three search engines, namely PubMed, Science Direct, and Google Scholar. The selected keywords in both English and Indonesian include "unsafe action" or "tindakan tidak aman" or "perilaku tidak aman" or "unsafe behaviors" or "pekerja konstruksi" or "construction workers" or "proyek" or "kecelakaan kerja" or "work accidents" or "analisis bivariat" or "bivariate analyze" or "knowledge" or "pengetahuan" or "PPE use" or "penggunaan APD" or "pengawasan" or "supervisor".

The preparation of this systematic review was carried out through the process of searching, identifying, reviewing, selecting, and choosing studies related to unsafe action factors regarding work accident incidents. The preparation of a systematic review begins with the search for articles by applying the PRISMA guidelines, which include step-by-step instructions consisting of Identification, Screening, Eligibility, and Inclusion. The collected data is imported into Mendeley software, and duplicate articles are automatically removed.

The inclusion criteria used in this study are full-text articles, open access, having an ISSN, as well as publications published in the last 5 years, specifically between 2019 and 2023, and using a cross-sectional study design with bivariate analysis. The variables studied in the unsafe action factor are knowledge, use of PPE, and supervision. The exclusion criteria used are articles published before 2018, duplicates, and those not relevant to the keywords. Then, studies other than cross-sectional design and those outside the variables being researched. After searching through the entire international and national databases of the three search engines, 2,747 articles were found. After three stages of examination; duplicate check, title and abstract check, full-text check, type of research and analysis, publication year, ISSN code, and research variables, 8 articles entered the final analysis. The research flowchart is presented in Figure 1.

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E-ISSN :2962-1658
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https://doi.org/10.47709/ijmdsa.v4i2.6200

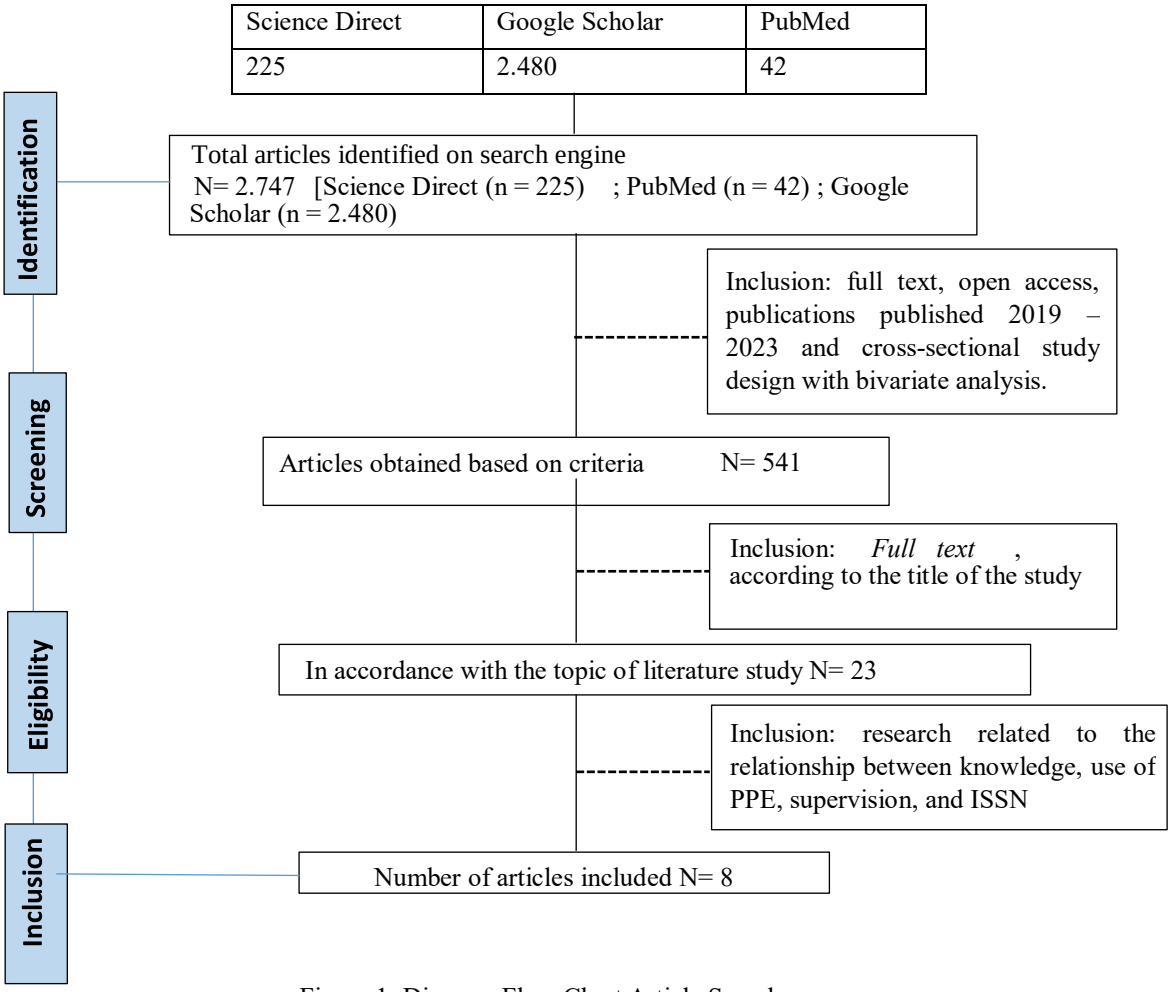



Figure 1. Diagram Flow Chart Article Search

**RESULT**

| Author/Years | Place | Title | Sample/Method | Finding |
|---|---|---|---|---|
| Clara Bota Ayu Kedang, Noorce Ch. Berek, dan Johny A.R. Salmun (2023) | Hotel Harper, Kupang (Indonesia) | The Relationship between Knowledge, Attitudes, and Motivation with Unsafe Actions on Harper Hotel Construction Workers in Kupang City | 35 sample, *Cross sectional* | Knowledge, attitude, and motivation have a significant relationship with unsafe actions among construction workers during the construction of Hotel Harper in Kupang City. |
| Ernyasih, Tiara Rahmawati, Andriyani, Munaya Fauziah, dan Nurmalia Lusida (2022) | Project The Canary Apartment PT. Abadi Prima Intikarya (Indonesia) | Factors Related to Unsafe Behavior Among Workers on The Canary Apartment Project PT. Abadi Prima Intikarya in 2022 | 70 sample, *Cross sectional* | Factors related to unsafe behavior among workers on the The Canary Apartment project by PT. Abadi Prima Intikarya are attitude, knowledge, supervision, training, and availability of PPE. |
| Muhammad Yaqub, Yuliati, dan Mansyur Solulipu (2022) | Raudah Makassar (Indonesia) Hospital | Factors Related to Unsafe Actions Among Construction Workers at Raudah Hospital Makassar | 34 sample, *Cross sectional* | There is a significant relationship between perception, supervision, and unsafe actions among construction workers at the Raudah Hospital development in Makassar. |

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E-ISSN :2962-1658
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|---|---|---|---|---|
| Noviyanti, Yessi Azwar, dan Ahmad Afif Rizky Pratama (2022) | PT. X Kota Batam penyedia kontraktor (Indonesia) | The Relationship Between Knowledge and Attitude with Unsafe Actions Among Height Workers at PT. X Batam City | 30 sample, *Cross sectional* | There is a relationship between knowledge and attitude with Unsafe Actions among Height Workers at PT. X Batam City. The results of the observation showed that accidents occurred while working at heights, resulting in fatalities. Unsafe actions identified included not using Personal Protective Equipment (PPE) such as body harnesses and gloves, and performing tasks in incorrect or improper positions. |
| M Fadli Sheh Akbar, Eka Cempaka Putri, Fierdania Yusvita, dan Mirta Dwi Rahmah Rusdy (2021) | PT Beton Konstruksi Wijaksana (Indonesia) | The Relationship Between Knowledge and Supervision with Unsafe Behavior Among Formwork Workers at PT Beton Konstruksi Wijaksana in 2020 | 46 sample, *Cross sectional* | There is a relationship between knowledge and supervision with unsafe behavior among workers in the Formwork Operational Department at PT Beton Konstruksi Wijaksana. |
| Sempurna Bangun dan Indriasari (2021) | Evencho Margonda Apartment Development Project (Indonesia) | Factors Related to Unsafe Actions Among Workers in the Evencho Margonda Apartment Construction Project | 75 sample, *Cross sectional* | 70 workers found unsafe actions performed by 44% of the workers. The knowledge factor is lacking 18.7%, the motivation factor is low 46.7%, the supervision factor is lacking 9.3%, the factor of workers not attending OHS training is 17.3%, and the factor of insufficient availability of personal protective equipment. Equipment accounts for 10.7% of all factors with the strongest relationship to unsafe actions. |
| Jumardi, Arum Dian Pratiwi, Nurmaladewi (2021) | Project of the Bank Indonesia Representative Office (KPwBI) Kendari | Factors Related to Unsafe Behavior Among Construction Workers (KPwBI) in Kendari | 83 sample, *Cross sectional* | There is a relationship between attitudes and supervision with unsafe actions among workers on the Bank Indonesia representative office project (KPwBI) in Kendari. |
| Sonatha Sapta Utami Panjaitan dan Marlinang Isabella Silalahi (2019) | PT. DAP Perumahan Citra Land Bagya City Kota Medan (Indonesia) | The influence of unsafe actions on work accidents among construction workers at PT. DAP Perumahan Citra Land Bagya City, Medan City | 30 sample, *Cross sectional* | There is a relationship between the use of personal protective equipment (PPE) and workplace accidents. |

## DISCUSSION

Work accidents in the construction or project sector often occur and can result in the cessation of operations and a decrease in productivity. Research shows that 80–85% of workplace accidents are caused by human factors (Su'mamur, 2018). Most research findings indicate that workplace accidents in the construction sector fall into the minor category or result in injuries or disabilities, such as being hit by a grinder, punctured by a nail, cut by metal, head injuries from falling tools/materials, and inhaling building material particles (Ernyasih, 2022; Panjaitan, 2019). Various broad factors, including management system levels, social, psychological, and human-machine environment systems, can impact the development of unsafe actions (Noviyanti, 2022).

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E-ISSN :2962-1658
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Unsafe actions and human errors are significant contributors to hazardous incidents and direct work-related injuries (Harsini, 2020). The actions or behavior of workers in carrying out their jobs will affect their safety. When workers neglect to protect themselves from hazards in the workplace, the risk of work-related accidents increases. Increasing workers' awareness about the use of PPE, always maintaining cleanliness and order, the importance of always being careful while working, not smoking or joking while working, and always checking the condition of tools and placing them properly when not in use can help minimize the risk of workplace accidents (Huda, 2021).

Workers must know and be aware of how to stay safe while working and the risks that will occur if they do not work safely according to the established procedures. Insufficient knowledge about safety and health practices is one of the causes of workers engaging in unsafe actions that lead to workplace accidents (Dodoo, 2019). When someone with insufficient knowledge causes them to ignore the dangers around them, it results in failure to perform tasks according to the applicable regulations and ignorance of the risks involved.

Ernyasih's (2022) research states that a score of 3.5 means that workers with poor knowledge are 3.5 times more likely to engage in high-risk unsafe behavior compared to workers with good knowledge (Ernyasih, 2022). Someone with a low level of knowledge is more likely to engage in risky behavior at the workplace (Larasatie, 2022). However, on the contrary, someone with a good level of knowledge will always act appropriately and prevent workplace accidents (Utami, 2021).

Workers must have sufficient knowledge of Occupational Health and Safety (OHS) to be able to identify hazards in the workplace that may threaten them, conduct risk assessments, and estimate the severity of potential outcomes if a worker becomes a victim of a workplace accident. After analyzing and assessing the risks, workers can make decisions regarding preventive measures to avoid workplace accidents (Martiwi, 2017). In addition to knowledge related to Occupational Health and Safety (OHS), knowledge related to work execution methods and knowledge related to Personal Protective Equipment (PPE) is also important to minimize the risk of work accidents (Noor, 2018). There are two sides to a person's knowledge of an object, namely the positive side and the negative side. These two factors will influence a person's attitude because the attitude towards a certain object will become more positive as more positive aspects and objects are known, in this case, to take safe actions while working (Aprilianti, 2022).

One of the most effective ways to change worker behavior and help form safe work habits is through training. Providing education in the form of toolbox meetings and regular safety talks can enhance workers' knowledge (Huda, 2021). For workers who already have a strong understanding of OHS, this can further enhance their knowledge and skills, making them ready to face unexpected situations in the workplace (Panjaitan, 2019).

Protecting workers through location security techniques, work environment, and equipment is the top priority. However, sometimes hazardous situations cannot be fully controlled, so the use of personal protective equipment (PPE) is very important. Personal Protective Equipment (PPE) must be used while working and adjusted to the needs of the workforce to ensure the safety of workers and those around them, prevent the onset of work-related diseases, and prevent work-related accidents (Handari, 2021). Risk factors that arise if workers do not use PPE can endanger the workers' bodies, resulting in physical disabilities or even death, such as not wearing safety shoes, safety helmets, gloves, and body harnesses tailored to each type of work because each job has its own PPE standards. For example, safety shoes for construction workers are used to protect the feet from the potential danger of being pierced by sharp objects, and body harnesses are used to prevent workers from falling from heights. Although each piece of PPE is not related to one another, it is very important to use them all at once to protect the body while working.

The implementation of PPE usage in the workplace requires special attention to reduce the impact of workplace accidents. The lack of PPE usage is a routine violation committed by workers. Bangun's (2021) research found that helmets, which are supposed to be used to protect the head, are misused as places to put nails, and workers prefer to work barefoot rather than wearing shoes (Bangun, 2021). This indicates that many construction workers still neglect the provisions of Law Number 1 of 1970 and the Minister of Manpower and Transmigration Number PER.01/MEN/1980 regarding the Use of Personal Protective Equipment (PPE) (Panjaitan, 2019).

Several studies have found that the reasons for workers' non-compliance in using PPE are discomfort while using it, interference with work activities, lack of knowledge about the importance of using PPE, PPE maintenance, and low supervision (Yaqub, 2022). Workers believe that the work they do is not high-risk. There are no punishments or sanctions for not using PPE correctly, and the supervisor does not reprimand workers for not wearing PPE (Alfidyani, 2020). Therefore, it is necessary to establish regulations that mandate or enforce the use of personal protective equipment (PPE) in the workplace to encourage workers to use PPE as much as possible. By doing this, they will eventually get used to and feel comfortable wearing personal protective equipment (Panjaitan, 2019).

One of the factors contributing to unsafe behavior identified is the lack of supervision and safety management. Unsafe behavior is a consequence of the violation of standard procedures by workers, which reflects system weaknesses (Dodoo, 2019). This can be divided into two categories, namely inadequate safety monitoring and an inefficient safety system (Harsini, 2020). When supervision in the work area is inadequate, the likelihood of workers engaging in unsafe actions increases. The Indonesian Government Regulation Number 50 of 2012 concerning the K3 Management System states that supervision is conducted to ensure that every job is carried out safely and in accordance with the established procedures and work instructions. Thus, supervision can motivate workers to perform their tasks according to the established processes and procedures, enabling them to carry out their duties safely, effectively, and efficiently, and to

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E-ISSN :2962-1658
Volume 4, Number 2, April 2025
https://doi.org/10.47709/ijmdsa.v4i2.6200

avoid potential hazards (Larasatie, 2022).

One form of negligence is when the supervisor does not consistently remind workers about the SOP Workers often do not comply with or respect the established regulations, such as not using personal protective equipment (PPE) and joking with colleagues while working, which poses a risk of workplace accidents. This is due to the company's weak and incompetent supervision (Noor, 2018). Workers who lack safety awareness and the company fails to provide procedures, reprimands, or warnings to those who continue to act unsafely reflect the weakness of the company's management in providing guidance to workers (Noviyanti, 2022). Supervisory factors include the implementation of effective safety measures, supervisory style, commitment to safety, technical communication, and emphasis on competence and performance. The role of the supervisor in Akbar's (2021) research is that if an employee commits a violation, for example, imposing sanctions such as suspension and lowering the employee's rating, which will affect the salary increase and bonus in the following year (Akbar, 2021). Supervision in the form of an unsafe report program will produce continuous reports that can visualize safe worker actions and changes in worker behavior over time, which will help management conduct evaluations.

Emphasis on unsafe actions can be achieved by improving the quality of supervision by project managers while construction workers are performing their tasks. It is hoped that supervisors will not only pay attention to their workers' actions but also to the work environment, materials, and tools, as these can cause accidents for the workers. They should also ensure the use of personal protective equipment while working and take strict action if workers violate the rules (Wulandari, 2023).

## CONCLUSION

The construction sector has significant potential hazards and risks for workplace accidents. Most work accidents fall under the classification of minor accidents. Most studies related to workplace accidents in the construction sector mention that knowledge, the use of PPE, and supervision influence workers to engage in unsafe actions. Knowledge related to occupational health and safety (OHS), equipment/material procedures and PPE, compliance with PPE usage, and weak supervision are the causes of workers engaging in unsafe actions.

Training and education are needed to enhance workers' awareness of occupational health and safety (OHS) knowledge, tool usage procedures, and personal protective equipment (PPE) so that workers can map out hazards and risks in their jobs and work environments. It is necessary to establish policy rules and commitments from supervisors and management to take strict action against workers who violate regulations, such as not using PPE, in the form of sanctions.

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E-ISSN :2962-1658
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