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CONSTRUCTION SAFETY IN JAPAN AND MALAYSIA: A COMPARATIVE STUDY OF REGULATORY SYSTEMS AND ON-SITE IMPLEMENTATION

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Abstract:

The construction industry remains one of the most hazardous sectors worldwide, with high rates of occupational accidents and fatalities in both developed and developing countries. Although construction safety in Japan and Malaysia has been examined separately, limited comparative research has systematically examined how differences in regulatory implementation, safety management systems, and on-site practices relate to safety outcomes. This study compares construction occupational safety governance and management practices in Japan and Malaysia, focusing on accident trends, fatality types, regulatory frameworks, contractor responsibilities, safety management systems, and worker training. A comparative documentary analysis was conducted using occupational safety statistics, legislation, regulatory guidelines, government reports, and peer-reviewed literature. Given differences in accident definitions, reporting systems, classification practices, and data completeness, the analysis emphasises relative trends and proportions rather than direct comparison of absolute accident numbers. The findings indicate that both countries have broadly similar regulatory principles and major categories of fatal construction accidents, with falls from height emerging as a prominent category. However, differences are more evident at the implementation level. From a macro perspective, both countries have established formal legal and institutional frameworks for construction occupational safety. At the micro level, Japan demonstrates a more systematic and proactive approach through detailed operational guidelines, structured safety training, continuous improvement mechanisms, and stronger

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integration of safety responsibilities into contractor management. In contrast, Malaysia remains comparatively compliance-oriented, with greater challenges in consistent implementation, structured training, and workforce competency, particularly among foreign workers. The findings suggest that Japan's sustained improvement in construction safety performance is associated with the integration of regulatory requirements with practical code of conduct that guide on-site safety behaviour and decision-making. The study highlights the importance of strengthening implementation mechanisms, safety education, and industry-led initiatives to improve construction safety outcomes in Malaysia and other rapidly developing countries.

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Keyword:

Comparative Study, Construction Safety, Japan, Malaysia, Regulatory Framework

Introduction

The construction industry plays a significant role in economic development, contributing approximately 5-7% of Gross Domestic Product (GDP) and accounting for 5-10% of total employment in many countries (Alaloul et al., 2021; Buckley et al., 2016; Statistics Bureau of Japan, 2025). Globalisation has further expanded the industry through international investment and collaboration, including the involvement of Japanese construction firms in Malaysia since the 1970s, which was further strengthened under the Look East Policy in the 1980s (Ibrahim et al., 2010; Asan & Akasah, 2015). However, these developments have also increased the complexity of construction workplaces and safety management particularly as projects involve diverse organisational structures and workforces.

The construction sector remains one of the most hazardous industries, characterised by high rates of occupational accidents and fatalities arising from complex operations, hazardous working environments, and labour-intensive processes (Hino et al., 2011; Hamid et al., 2019). Previous studies have reported notable differences in safety performance between developed and developing countries, with developing countries generally experiencing higher accident rates (Teo et al., 2008; Surasak, 2015). These accidents can result in productivity losses and significant financial impacts on construction organisations (Hasan et al., 2018).

In both developed and developing countries, differences in construction safety performance remain evident. Japan has achieved substantial improvements in construction safety through systematic regulatory frameworks and long-term accident prevention programmes. In contrast, Malaysia continues to experience relatively high construction accident rates, alongside a strong reliance on foreign labour within the construction workforce (Lode et al., 2023).

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This study aims to examine differences in construction occupational safety governance and management practices between Japan and Malaysia, with particular emphasis on fatal accidents. By analysing accident trends, regulatory frameworks, and safety management practices, the study evaluates how Japan's safety approaches may inform the improvement of construction safety performance in developing countries, particularly Malaysia.

Definition of Occupational Accident Rates in Japan and Malaysia

Occupational accident rates are generally expressed in relation to the size of the workforce; however, the definitions, reporting criteria, and statistical methods used in Japan and Malaysia differ. These differences are important when comparing occupational accident data between the two countries.

In Japan, occupational accident data are based on official reports submitted to the relevant Labour Standards Inspection Offices. Fatal accidents are confirmed through formal investigations, while non-fatal cases generally include occupational injuries resulting in four or more days of absence from work. In Malaysia, occupational accidents are reported to the Department of Occupational Safety and Health (DOSH) based on the definitions and reporting requirements established under the relevant occupational safety and health regulations.

Overall, Japan applies more detailed and standardised criteria for the classification and reporting of occupational accidents, whereas Malaysia adopts a comparatively broader reporting framework. These differences in accident definitions, reporting requirements, and investigation practices limit direct comparison of absolute accident figures between the two countries and should therefore be considered when interpreting comparative accident trends and rates.

Research Methodology

This study adopts a document-based comparative research approach using occupational safety data, regulatory documents, and safety-related publications from government agencies and relevant organisations in Japan and Malaysia. Malaysian data were obtained from the Department of Occupational Safety and Health (DOSH), Social Security Organisation (SOCSO), Institute of Labour Market Information and Analysis (ILMIA), and Department of Statistics Malaysia. Japanese data were obtained from the Japan Industrial Safety and Health Association (JISHA) and the Ministry of Health, Labour and Welfare (MHLW).

Content analysis and frequency distribution analysis were used to examine accident trends, fatal accident types, regulatory frameworks, and safety management practices. The findings were subsequently interpreted through a comparative analysis to identify differences in occupational safety governance, contractor responsibilities, training systems and accident prevention measures between the two countries.

The analysis covers the period from 2000 to 2020. The 2020 cut-off was adopted to maintain a consistent pre-pandemic observation period, as the COVID-19 pandemic substantially disrupted construction activities, workforce deployment, working arrangements, and accident exposure in both countries after 2020. Focusing on the 2000-2020 period therefore provides a more consistent basis for examining long-term construction safety trends without conflating pandemic-related disruptions with changes in occupational safety performance.

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Construction Accident Trends in Japan and Malaysia

Japan has experienced a sustained decline in construction casualties over time, whereas Malaysia has shown no consistent reduction. Although the proportion of construction casualties relative to total industrial casualties is approximately three to four times higher in Japan than in Malaysia, the absolute number of reported construction casualties in Malaysia is considerably lower. This apparent difference should be interpreted with caution, as the two countries apply different reporting and classification systems (Table 1).

Differences in the classification and recording of non-fatal injuries, investigation practices, and data collection procedures may affect the comparability of accident statistics between the two countries. Therefore, the analysis focuses primarily on relative trends and proportions rather than absolute accident numbers, providing a more meaningful basis for comparing construction safety performance within the respective national contexts.

Table 1: Accident Trends in Malaysia and Japan Between 2000-2020

	Malaysia (DOSH)				Japan (JISHA)			
	All Industries		Construction		All Industries		Construction	
Year	Number of Accidents	Number of Fatalities	Number of Accidents	Number of Fatalities	Number of Accidents	Number of Fatalities	Number of Accidents	Number of Fatalities
2000	-	-	-	-	139,974	1,889	29,747	731
2001	-	-	-	-	140,149	1,790	28,284	644
2002	-	-	-	-	132,399	1,658	26,299	607
2003	-	-	-	-	132,936	1,628	24,543	548
2004	-	-	-	-	132,248	1,620	23,809	594
2005	-	-	-	-	133,050	1,514	22,869	497
2006	-	-	-	-	134,298	1,472	22,386	508
2007	3,395	219	181	95	131,478	1,357	20,764	461
2008	2,498	230	129	72	129,026	1,268	19,280	430
2009	2,386	224	115	71	114,152	1,075	16,268	371
2010	2,534	185	120	66	116,733	1,195	16,143	365
2011	2,429	176	99	51	117,958	1,024	16,773	342
2012	2,781	191	177	67	119,576	1,093	17,073	367
2013	2,832	191	164	69	118,127	1,030	17,189	342
2014	2,805	204	172	72	119,535	1,057	17,184	377
2015	3,345	214	237	88	116,311	972	15,584	327
2016	3,750	239	247	106	117,910	928	15,058	294
2017	3,635	267	240	111	120,460	978	15,129	323
2018	5,031	260	232	118	127,329	909	15,374	309
2019	7,984	259	326	84	125,611	845	15,183	269
2020	6,933	213	206	66	131,156	802	14,977	258

Notes:
1) Japanese occupational safety and health (OSH) were compiled from data collected by the Ministry of Health, Labour, and Welfare (MHLW) and published by the Japan Industrial Safety and Health Association (JISHA) and related sources (JISHA, 2025; JICOSH, 2001)
2) Malaysian OSH statistics were obtained from data published by the Department of Occupational Safety and Health (DOSH, 2025).
3) Data for all industries in Malaysia for 2000-2006 were not available from DOSH.
4) Accident rates are expressed per 1,000 workers for non-fatal injuries and per 100,000 workers for fatal injuries, where applicable.
5) The study period is limited to 2000-2020 to minimise potential distortions in accident trends associated with the COVID-19 pandemic and its disruption of construction activities after 2020.

To address these limitations and improve comparability, this study adopts a relative comparison approach by analysing construction accidents as a proportion of total industrial accidents rather than relying solely on absolute figures (Figure 1). This approach reduces the influence of differences in the scale of the workforce and provides a clearer indication of the relative significance of construction-related risks within each national context. Where possible, data

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from multiple official sources were cross-referenced to enhance data reliability. Despite these limitations, the analysis provides a useful basis for identifying differences in construction safety trends and management practices between the two countries.

Most importantly, the contrasting trends suggest that improvements in construction safety are not determined solely by the existence of regulatory requirements, but also by the effectiveness of their implementation, monitoring, and continuous improvement. This finding highlights a key difference in safety governance between the two countries: while both have established formal regulatory frameworks, Japan demonstrates a more systematic and implementation-oriented approach to translating regulatory requirements into sustained safety practices.

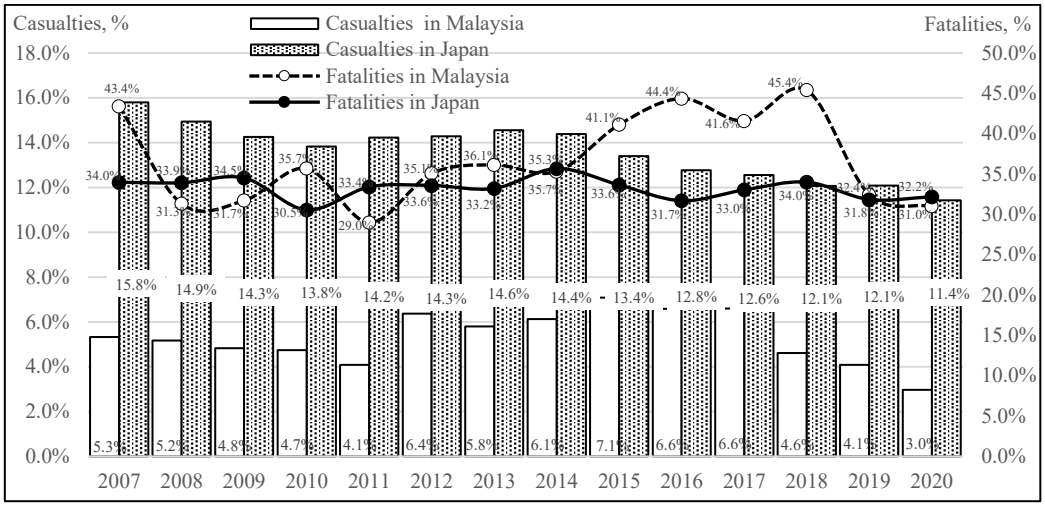

Figure 1: Comparison of The Shares of Fatal Accidents Among Casualties in Construction Industry Between Japan and Malaysia

(Sources: DOSH Malaysia and JISHA Japan Official Statistics)

Construction Fatalities in Japan and Malaysia

The proportion of construction-related fatalities relative to all industries remains substantial in both countries, reflecting a broader global pattern (ILO, 2015; ILO, 2019; BLS, 2023). In Japan, construction fatalities have declined substantially over the long term, from 2,440 cases in 1973 to 232 cases in 2024, as reported by the Japan Industrial Safety and Health Association (JISHA) (Figure 2). This sustained decline coincides with the continued development of industrial accident prevention strategies and regulatory measures in Japan. In contrast, construction fatalities in Malaysia have fluctuated considerably from year-to-year, indicating less consistent safety performance. The extended Japanese series is presented separately to illustrate the long-term historical trend, whereas the comparative analysis between Japan and Malaysia is restricted to 2000-2020.

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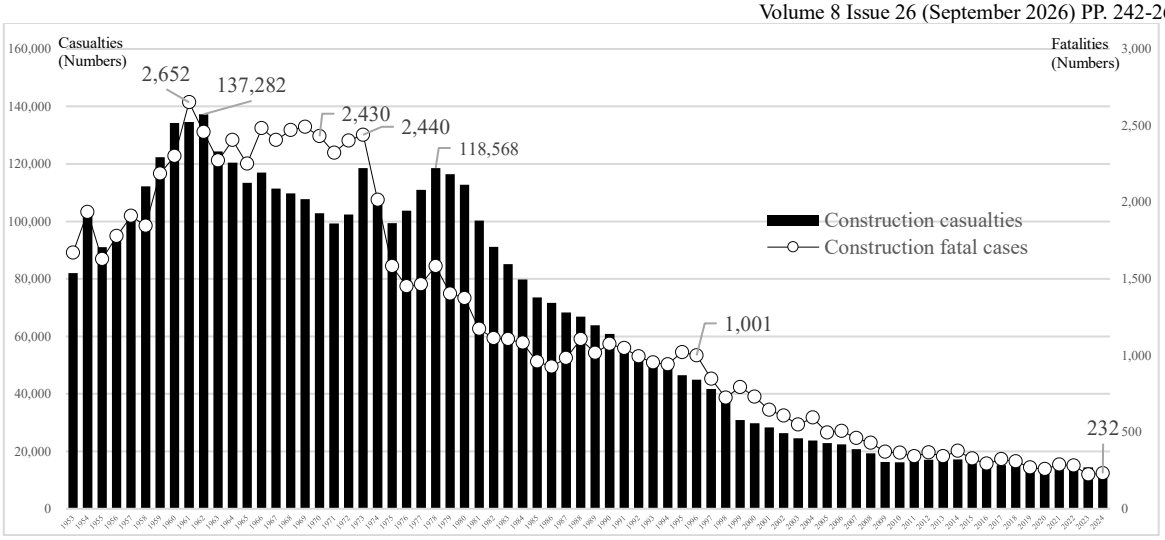

Figure 2: Number of Construction Casualties and Fatalities in Japanese Construction Industry (1953-2024)

(Sources: JISHA Japan Official Statistics)

Japan adopts a systematic, detailed, and standardised approach to accident investigation and reporting, which supports the identification of accident causes and the development of effective preventive measures. In Malaysia, however, limitations in reporting systems and investigation practices may contribute to underreporting and inconsistencies in the available data, potentially constraining the development of targeted safety interventions.

Underreporting remains a significant concern, particularly given the substantial presence of foreign workers. Previous research has reported that a large proportion of foreign workers may have been employed under illegal or expired permits, potentially contributing to gaps in official accident statistics (Abdul Rahim et al., 2008). In addition, weak regulatory enforcement and the potential negative consequences of accident reporting for contractors may discourage accurate disclosure (Agwu, 2014; Oswald et al., 2020).

Taken together, these findings suggest that the higher fatality burden observed in Malaysia should not be attributed solely to differences in reporting practices. The findings also point to broader challenges related to regulatory implementation, safety management practices, and workforce competency. In contrast, Japan's sustained reduction in construction fatalities coincides with long-term institutional commitment, structured training, and systematic regulatory enforcement, suggesting that these factors may contribute to improved construction safety outcomes (Chan et al., 2023).

Construction Fatal Accident Types in Japan and Malaysia

A comparative review of fatal construction accident types in the two countries reveals broadly similar patterns, with notable differences in classification and reporting practices. In Japan, accident investigations use detailed and standardised categories, providing comprehensive information on individual cases. In Malaysia, only 214 fatal construction cases were investigated by the Department of Occupational Safety and Health (DOSH) between 2007-2020 (Table 2), although the total number of reported construction fatalities during the same period was substantially higher (1136 cases, shown in Table 1). This difference suggests that

not all reported fatal cases were subject to the same level of investigation or classification, which may affect the completeness and comparability of accident-type data. The less detailed classification of investigated cases may also reflect differences in accident investigation practices adopted by DOSH (DOSH, 2025). Understanding the distribution of fatal accident types is essential for developing effective preventive strategies (Shao et al., 2019).

Table 2: Construction Fatalities Accident Types in Japan and Malaysia

	Construction Industry Fatalities Accidents			
	Malaysia (2007-2020)		Japan (2006-2020)	
Accident Classification	**Cases**	**%**	**Cases**	**%**
Falls from height	92	43.0%	2,349	44.0%
Struck, crushed, and hit by	79	36.9%	1,202	22.5%
Collapse, buried	19	8.9%	492	9.2%
Drowning	6	2.8%	120	2.2%
Electrocution	8	3.7%	102	1.9%
Burn	1	0.5%	58	1.1%
Explosion	1	0.5%	16	0.3%
Others	8	3.7%	1,004	18.8%
Total	214	100.0%	5,343	100.0%

Note: Accidents were recorded and investigated by DOSH Malaysia and JISHA Japan, respectively

As shown in Table 2, both countries exhibit similar patterns in the distribution of fatal construction accident types. Falls from height account for the largest proportion of fatalities in both Malaysia (43.0%) and Japan (44.0%), followed by incidents involving being struck, crushed, or hit (36.9% in Malaysia and 22.5% in Japan). Other accident categories, including collapse, electrocution, and drowning, account for comparatively smaller proportions in both countries.

Despite these similarities, Japan reports a substantially higher proportion of cases under the "Others" category (18.8%). This may reflect its more granular classification system, which captures a wider range of incidents, including contact with hazardous substances, commuting accidents, and occupational conditions such as heatstroke and vibration-related disorders. In contrast, the "Others" category in Malaysia is more limited and less systematically defined, suggesting differences in the level of classification detail and reporting consistency between the two countries.

From a causal perspective, construction fatalities in both countries are largely associated with unsafe working conditions and human factors. In Japan, fatal incidents frequently occur around temporary structures, unprotected edges, or locations lacking adequate fall-prevention measures, particularly in high-rise construction projects (Manzoor et al., 2021). In Malaysia, commonly reported contributing factors include non-compliance with safe work procedures, inadequate use of personal protective equipment, insufficient supervision and training, unsafe working conditions, and ineffective hazard identification (Hu et al., 2011; Khosravi et al., 2014; Nadhim et al., 2016; Ayob et al., 2018; Ammad et al., 2021).

These findings suggest that, although the nature of construction risks is broadly similar between the two countries, differences in classification detail and causal attribution reflect differences in safety management practices. Japan's more detailed categorisation facilitates the identification of specific risk patterns and may support the development of more targeted intervention strategies. In contrast, the less detailed classification of fatal accidents in Malaysia may limit the availability of information needed to identify specific risk patterns and develop targeted prevention measures.

Laws and Guidelines Governing Construction towards Fall Protection

Previous studies have identified that construction accidents are largely associated with unsafe working conditions and behaviours, which can be mitigated through the effective implementation of safety and health regulations (Srinavin, 2007). In Malaysia, employers are legally obligated under the Occupational Safety and Health Act (OSHA) 1994 (Part IV) to ensure the safety and health of workers in the workplace. The Construction Industry Standard (CIS 15:2019) further specifies that only full-body safety harnesses meeting recognised national or international standards are permitted for work at height, replacing traditional safety belts. However, while the guidelines recommend the use of fall-arrest systems where there is a risk of falling, they do not clearly specify a minimum height threshold at which such measures become mandatory.

In contrast, Japan adopts a more proactive regulatory approach characterised by periodic regulatory revisions and preventive strategies, which has contributed to improved safety outcomes. The revision of the Safety and Health Law Enforcement Regulations, enforced in 2019, mandates the use of full-body harnesses for work at heights exceeding five metres in the absence of fall-prevention facilities such as scaffolding or guardrails. In addition, the use of torso-type safety belts was prohibited from 2022. These measures establish clearer regulatory thresholds and provide a more prescriptive framework for fall protection than the Malaysian framework.

Falls from height remain one of the leading causes of fatalities in the construction industry in both developed and developing countries. Although both countries recognise the importance of fall protection systems, including personal fall arrest systems (e.g., lifelines) and collective protection measures (e.g., perimeter guardrails), their regulatory approaches differ. In Malaysia, the absence of a clearly defined threshold for work at height may result in inconsistencies in the implementation of fall protection measures.

From a safety management perspective, personal protective equipment should be regarded as a lower-level control within the hierarchy of controls and applied when hazards cannot be eliminated or adequately controlled through design or engineering measures. Nevertheless, both Malaysian and Japanese regulations generally require physical fall-prevention measures for work conducted at heights of two metres or more where a risk of falling exists. Strengthening compliance with these requirements and improving worker safety awareness remain critical, particularly in developing countries where safety management practices may be less established (Biswas et al., 2017).

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Countermeasures against Falls from Scaffolding

Scaffolding remains a major source of accidents on construction sites, particularly those involving falls from height. In Malaysia, contractors are required to appoint competent personnel to ensure the safety erection and alteration of scaffolding. All scaffolding work must be carried out by certified scaffolders who have undergone formal training and obtained competency certification recognised by the Department of Occupational Safety and Health (DOSH). The Construction Industry Standard (CIS 22:2017) outlines requirements for safe scaffolding practices, including material selection, construction procedures, and inspection protocols. In addition, CIS 15:2019 emphasises fall-prevention measures, such as installation of horizontal and vertical lifelines, temporary guardrails, toe boards, and fully decked working platforms as edge protection during the erection and alteration of scaffolding. Contractors are also responsible for conducting risk assessments in accordance with Hazard Identification, Risk Assessment and Risk Control (HIRARC) procedures to ensure safe operations.

In Japan, similar requirements apply to the employment of qualified scaffolders under the Industrial Safety and Health Act (1972) (Article 14). However, the regulatory framework adopts a more proactive and preventive approach. Contractors are required to submit scaffolding plans in advance, at least 30 days before construction for certain types of scaffolding, allowing the relevant authorities to assess potential risks before work begins. In addition, Japan promotes method-based safety practices, such as the "handrail-first erection method", which enhances worker protection during the assembly and dismantling of scaffolding. Further regulatory enhancements, including revisions to the Ordinance on Industrial Safety and Health, mandate the installation of guardrails and toe boards across different types of scaffolding. Institutional support from organisations such as the National Institute of Occupational Safety and Health, Japan (JNIOSH) also contributes to continuous improvement through accident analysis and the refinement of preventive measures.

Overall, while both countries implement fundamental scaffolding safety measures, Japan adopts a more systematic and proactive approach characterised by advance planning, method-based safety practices, and continuous regulatory improvement. In contrast, Malaysia's approach remains largely compliance-driven and dependent on contractor-level implementation. This comparison suggests that incorporating proactive planning and method-oriented safety practices could enhance scaffolding safety performance in Malaysia.

Guidelines for Contractors' Construction Work in Japan and Malaysia

In most countries, the principal contractor bears primary responsibility for ensuring safety on construction sites (Hino et al., 2011). Both Japan and Malaysia have established occupational safety and health (OSH) management guidelines aligned with international principles, particularly the ILO-OSH 2001 framework. Japan introduced the Construction Occupational Safety and Health Management System (COHSMS) Guidelines in 1999, with revisions made in 2006, specifically for the construction sector. In Malaysia, the Guidelines on Occupational Safety and Health in Construction Industry (Management) were revised and published in 2017 to promote systematic OSH management practices in construction.

Both frameworks incorporate core elements such as safety policy, worker participation, training, risk assessment, and continual improvement. However, as summarised in Table 3, the Japanese COHSMS Guidelines provide a more detailed and construction-specific

interpretation of these elements. In particular, the Japanese framework explicitly incorporates safety objectives, structured implementation plans, and continuous monitoring mechanisms, whereas the Malaysian OSHMS Guidelines provide a more general framework applicable across industries.

The comparison in Table 4 further highlights differences in the responsibilities assigned to principal contractors. The COHSMS Guidelines specify comprehensive responsibilities, including the establishment of safety objectives, preparation and implementation of safety plans, continuous monitoring, accident investigation, and system audits. In contrast, the Malaysian Occupational Safety and Health in Construction Industry (Management) Guidelines primarily emphasise general duties such as planning, coordination, site induction, and worker engagement, with less emphasis on systematic performance evaluation and continual improvement.

Overall, although both countries adopt internationally aligned OSH management principles, Japan demonstrates a more structured and construction-specific approach, with greater emphasis on defined operational requirements and performance monitoring. Malaysia's framework, while aligned with international OSH management principles, is comparatively less prescriptive in its contractor-specific requirements. Strengthening the specificity of contractor guidelines and their implementation mechanisms could enhance the effectiveness of OSH management practices in the Malaysian construction industry.

Table 3: Comparison of COHSMS Guidelines Japan and Guidelines OSHMS Malaysia Based on ILO-OSH 2001

Guideline on Occupational safety and health management system (ILO OSH 2001)	**Japan COHSMS guideline (Basic requirements for construction sites)**	**Guidelines on Occupational Safety and Health Management System, Malaysia (all industries)**
3.1 Health and safety policy	5.2.1 Statement of construction safety and health policy	3.1.1 Occupational safety and health policy
3.2 Participation of workers	5.2.2 Reflecting the opinions of construction workers and employees of business establishments related to the construction work	3.1.2 Employee participation
3.3 Responsibility and accountability	5.2.3 Dissemination of system	3.2.1 Responsibility and accountability and authority
3.4 Ability and education / training	5.2.4 Evaluation of safety and health management ability of related contractors	3.2.2 Competence and training and awareness
3.5 Documentation for the management system	5.2.5 Documentation 5.2.6 Record	3.2.3 OSH MS documentation
3.6 Communication	5.2.10 Second item of preparation of construction safety and health plan (2)	3.2.4 Communication
3.7 Initial survey	5.2.7 Investigation of danger and harmfulness, etc. and	3.3.1 Initial review

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	determination of implementation items	
3.8 Developing and implementing of a health and safety plan	5.2.10 Developing of a health and safety plan 5.2.11 Implementing of a health and safety plan	3.3.2 Occupational safety and health objectives 3.3.3 Hazard Identification, Risk Assessment and Risk Control (HIRARC)
3.9 Health and safety goals	5.2.9 Implementation of health and safety goals	-
3.10 Removal of hazards	5.2.12 Measures for emergencies	3.3.4 Emergency Preparedness and Response 3.3.5 Management of change
3.11 Investigation and measurement of implementation status	5.2.13 Routine inspection / improvement, etc.	3.4.1 Performance monitoring and measurement
3.12 Investigation of injuries and illnesses	5.2.8 Efforts to maintain and improve physical and mental health and create a comfortable working environment	3.4.2 Incident investigation
3.13 Audit	5.2.16 System audit	3.4.3 Audit
3.14 Management review	5.2.17 System review	3.4.4 Management Review
3.15 Prevention and corrective measures	5.2.14 Investigation of causes of occupational accidents, etc.	3.5.1 Preventive and corrective action
3.16 Continuous improvement	5.2.13Second item of daily improvement, etc. (2) 5.2.14 The second item of investigation of the cause of occupational accidents, etc. (2)	3.5.2 Continual improvement

Table 4: Basic Needs for Principal Contractor (COHSMS Guidelines) and Responsibilities of Contractor (Guidelines of OSH in Construction Industry (Management) 2017 Malaysia

Section	Principal Contractor (COHSMS Guidelines)	Paragraph	Principal Contractor (OSH (management) Guidelines)
5.1.1	Declaration of safety and health policy		Section 5.3 What should a principal contractor do?
5.1.2	Incorporation of workers' opinions	92-105	Planning, managing, monitoring, and coordinating the construction phase
5.1.3	Establishment of a system implementation structure	106	Providing suitable site inductions
5.1.4	Implementation of education about the system	108	Preventing unauthorised access to the site
5.1.5	Evaluation of safety and health management capability of related contractors	110	Providing welfare facilities
5.1.6	Documentation	112	Liaising with the principal designer

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5.1.7	Record keeping	114	Consult and engage with workers including the safety and health and welfare stated in the Act
5.1.8	Assessment of hazards, harmful effects, or equivalent and determination of matter to be implemented		
5.1.9	Establishment of safety and health objectives		
5.1.10	Preparation of safety and health plan		
5.1.11	Implementation of safety and health plan		
5.1.12	Responses to emergencies		
5.1.13	Daily monitoring and improvement		
5.1.14	Investigation of causes of industrial accidents		
5.1.15	System audits		
5.1.16	System Review		

Safety Management Organisations on Construction Sites

In Malaysia, the Occupational Safety and Health Act (OSHA) 1994 requires the appointment of a qualified Safety and Health Officer (SHO) for building operations where the total contract value exceeds RM20 million, as stipulated in the Occupational Safety and Health (Safety and Health Officer) Order 1997. The employer is also required to appoint a Site Safety Supervisor (SSS) where applicable. The SHO or SSS reports to the site manager or project director and oversees safety matters across the various trades on site (Figure 3). An individual is not permitted to hold registration as both an SHO and an SSS simultaneously, thereby maintaining role separation and accountability within the safety management structure.

In contrast, Japan adopts a more integrated and hierarchical approach to safety management (Ojima, 2020). Under the Industrial Safety and Health Act (1972), detailed provisions govern the appointment of specialised safety and health personnel. The Project Manager serves as the General Safety and Health Manager, assuming overall responsibility for safety and health management on site (Figure 4). Subcontractors are required to appoint qualified safety and health supervisors for their respective work scopes. In practice, experienced foremen often undertake supervisory roles and directly oversee workers' operations. In addition, the principal contractor is responsible for providing structured safety education and training to supervisory personnel to ensure competency in safety management (JISHA, 1995).

Compared with Malaysia, Japan's safety management structure is more clearly defined, with explicit roles, responsibilities, and competency requirements embedded within its regulatory framework. The integration of safety responsibilities into project leadership roles, supported by structured training, strengthens the organisational basis for on-site safety management. In Malaysia, although designated safety personnel support regulatory compliance, the separation of safety functions from core project management may limit their integration into broader project decision-making.

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Overall, Japan's approach emphasises integration and accountability within the organisational structure, whereas Malaysia's system remains more compliance-oriented and role-specific. Strengthening the integration of safety responsibilities into project leadership could enhance the effectiveness of safety management practices in the Malaysian construction industry.

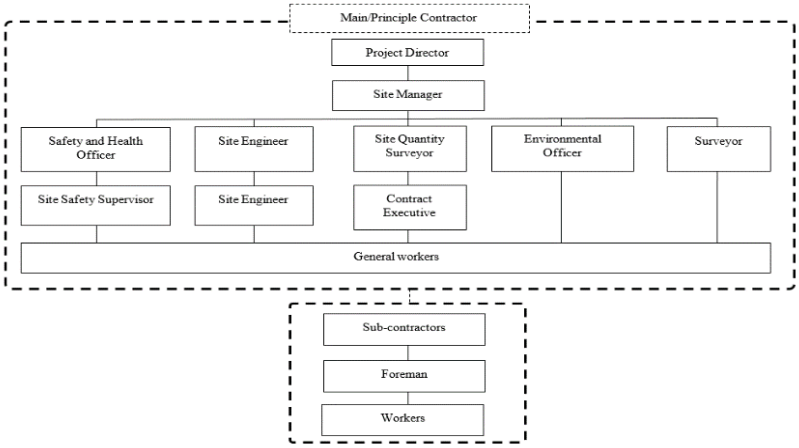

Figure 3: Construction Project Organisation Chart in Malaysia *(modified by the author accordance to the project engineers through an interview)*

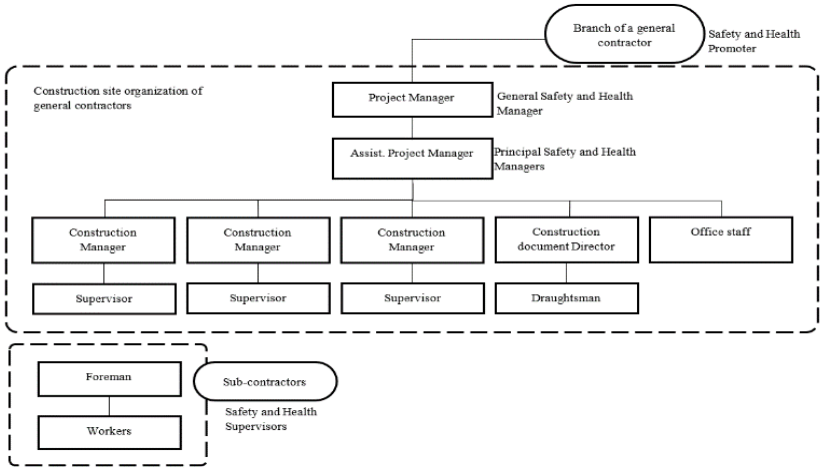

Figure 4: Organisation Chart of Japanese Construction Site *(modified by the author accordance to the project engineers through an interview)*

Establishment of Safety Committee at Workplace

In Malaysia, the establishment of a safety and health committee is required at workplaces with 40 or more employees, or where directed by the Director General of the Department of Occupational Safety and Health (DOSH), as stipulated under the Occupational Safety and Health Act 1994. However, the Act does not clearly specify the committee's composition, number of members, or qualification requirements, which may result in inconsistencies in implementation across construction sites.

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In Japan, the establishment of a safety and health committee is mandatory at workplaces meeting the prescribed employee threshold, including construction sites employing more than 50 workers, as stipulated under the Industrial Safety and Health Act (1972) and its Enforcement Order. The committee comprises key personnel, including the general safety and health manager, safety officers, health officers, industrial physicians, and worker representatives with relevant safety and health experience. This structured composition provides a formal mechanism for worker participation and accountability in occupational safety and health management.

Furthermore, Japan supports workplace safety governance through an extensive regulatory and inspection system, including Labour Standards Inspection Offices established nationwide to monitor and enforce occupational safety and health requirements. This institutional framework provides additional support for workplace safety management and reflects a more structured regulatory approach than Malaysia, where the statutory requirements concerning the composition and qualifications of safety and health committee are comparatively general.

Safety Management Programmes on Construction Sites

Most countries have adopted safety management systems in the construction industry (Fern et al., 2021); however, Malaysia continues to exhibit relatively low levels of implementation of safety and health management practices (Manu et al., 2018). The existing assessment tool, the Safety and Health Assessment System in Construction (SHASSIC), developed by the Construction Industry Development Board (CIDB), has been criticised for its limited emphasis on project-level implementation, particularly in relation to auditing practices and the effectiveness of safety personnel (Abas et al., 2020).

According to the Guidelines on OSH in Construction Industry (Management) Malaysia, contractors are required to identify gaps between workers' existing competencies and the skills, knowledge, and training required for their assigned tasks. Training should be provided accordingly; however, where workers are assessed as competent, additional training may not be necessary. Although outside the study period, the 2022 amendment to the Occupational Safety and Health Act 1994 further strengthened this requirement by mandating that employees complete relevant OSH training before undertaking work for which such training is required.

Effective safety and health management programmes should be specific, continuously monitored, and consistently enforced to enhance safety performance on construction sites (Smallwood, 2017). In Japan, the Ministry of Health, Labour and Welfare (MHLW) introduced the Guidelines for Safety Management of Construction Sites in 1995, establishing a comprehensive and structured framework for principal contractors. The effectiveness of such programmes is closely associated with management commitment and active worker participation (Priyadarshani et al., 2013; Ayob et al., 2018).

The Japanese framework outlines 13 core safety management programmes, including the development of safety and health plans, control of multi-layer subcontracting, clear allocation of safety responsibilities and costs, identification of contractors and workers, preparation of work procedures, establishment of safety councils, regular coordination meetings, daily site patrols, worker education, safety briefings, toolbox meetings, implementation of safety cycles, and the formation of foremen associations. Collectively, these measures provide a structured and comprehensive approach to construction safety management. Their long-term

implementation has been associated with sustained improvements in construction safety performance and a reduction in occupational accidents in Japan, highlighting the potential value of systematic and continuously monitored safety management initiatives.

Overall, while Malaysia has established fundamental regulatory and training requirements, the implementation of safety management programmes appears less structured than that observed in Japan. Strengthening programme specificity, enforcement mechanisms, and continuous monitoring may enhance the effectiveness of safety management practices and improve safety performance in the Malaysian construction industry.

Construction Foreign Workers in Malaysia

In Malaysia, foreign workers constitute approximately 70% of the construction workforce and are predominantly employed in low-skilled and high-risk jobs (Abdul-Rahman et al., 2012; Ismail & Yuliyusman, 2014). This heavy reliance on foreign labour has important implications for construction safety, particularly as a substantial proportion of construction accidents has been associated with unsafe human behaviour (Suraji et al., 2001).

Despite their critical role in the construction sector, the recruitment policies administered by the Immigration Department of Malaysia (Ministry of Home Affairs, 2025) do not explicitly require industry-specific skills certification or prior industry-related training. Although basic safety induction is legally required, the comprehensive technical skills accreditation system described above does not fully extend to the foreign workforce. This distinction suggests that, while minimum safety requirements are in place, the broader competency development of foreign workers may remain limited. This may contribute to the continued reliance on low-skilled labour and limit the standardisation of workforce competency.

Findings from this study, together with the accident trend analysis, suggest that inadequate training and limited competency among foreign workers may contribute to safety performance issues. This is consistent with previous studies indicating that many foreign workers receive limited formal safety training upon arrival, which may adversely affect safety behaviour, productivity, and work quality (Abdul-Rahman et al., 2012). Given their substantial presence on construction sites, such competency and training gaps may have implications for overall safety performance.

While foreign workers are essential for addressing labour shortages, their concentration in low-skilled roles presents a structural challenge to construction safety management. The reliance on cost-efficient labour may create a trade-off between economic considerations and workforce competency, potentially affecting safety performance (Hamid et al., 2011; Ismail et al., 2018). In addition, the limited integration of structured training and competency certification systems may constrain the effectiveness of safety management implementation at the site level.

Compared with Japan, where formal training and certification systems for foreign construction workers are more institutionalised, Malaysia's approach appears less structured. This difference suggests that workforce competency is an important factor in construction safety performance. Strengthening training requirements and establishing competency-based certification systems could therefore support improvements in construction safety outcomes in Malaysia.

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Skilled Training System for Foreigners in Japan

In Japan, the construction industry accounts for approximately 7% of total national employment (Statistics Bureau of Japan, 2025). The proportion of foreign construction workers also increased from 0.23% in 2008 to 3.48% in 2019, reflecting growing labour demand. In response, Japan has established a structured technical training system for foreign workers, supported by institutional linkages with labour-supplying countries in Southeast Asia.

Effective safety training is widely recognised as an important factor in improving construction safety performance (Demirkesen & Arditi, 2015). A skilled and well-trained workforce contributes to safer site practices and more effective project management (Ofori et al., 2013). Accordingly, Japan has developed a formalised training framework to support the development of competency among foreign workers.

Foreign workers participating in Japan's Technical Intern Training Programme are required to undergo structured training under the Technical Intern Training Act. The system is intended to ensure systematic skills development while protecting the welfare of technical intern trainees. The training period may extend for up to five years and is implemented based on approved training plans that specify the required skills and training activities.

The MHLW defines the scope of occupations covered by the programme, while the Japan International Training and Skilled Worker Cooperation Organisation (JITCO) categorises construction-related training into 33 operations across 22 job categories, including scaffolding, formwork, and roofing (JITCO, 2025; OTIT, 2025). This structured approach provides a standardised framework for technical skills development and supports the development of safety awareness among foreign workers.

Overall, Japan's integration of regulated training systems with established safety management and enforcement mechanisms provides a more institutionalised approach to developing the competency of foreign construction workers. Compared with Malaysia, this approach highlights the potential importance of competency-based training and structured skills development in strengthening construction safety management.

Discussion

The 10-year average proportion of construction fatalities relative to all industries is comparable between Malaysia and Japan. However, Japan demonstrates a relatively stable trend, whereas Malaysia exhibits greater year-to-year fluctuation. In addition, the ratio of reported construction casualties to casualties across all industries in Malaysia is approximately one-third of that in Japan, suggesting a higher fatality-to-casualty ratio in Malaysia. Although differences in reporting systems and accident classification must be acknowledged, these findings suggest that differences in safety performance may be associated with variations in the implementation and effectiveness of construction safety management between the two countries. Table 5 summarises the key findings of this study.

Falls from height remain a critical cause of fatal accidents in both developed and developing countries, accounting for approximately 40% of construction fatalities in both Malaysia and Japan. Other major accident categories show broadly similar patterns between the two countries. At the macro level, both Malaysia and Japan have established broadly comparable

institutional frameworks, including requirements for scaffolding safety, the use of full-body harnesses, occupational safety and health management systems, designated safety personnel, and safety and health committees at construction sites. However, both countries face workforce-related challenges, although these differ in nature. Japan faces an ageing construction workforce, whereas Malaysia has a high dependence on foreign workers in low-skilled occupations, raising concerns regarding training and competency. Thus, the presence of formal institutional frameworks does not necessarily translate into equivalent safety outcomes.

Nevertheless, the micro-level analysis reveals more substantial differences in implementation and regulatory specificity. Japan provides more detailed operational requirements, including explicit provisions on the working height at which full-body harnesses are required, whereas Malaysia does not clearly specify an equivalent threshold. Although Malaysia introduced requirements for harness-type safety belts earlier, Japan has continued to refine its regulatory framework through periodic revisions and proactive measures, including the "handrail-first" erection method for scaffolding. Furthermore, Japan's COHSMS provides comprehensive requirements, covering safety objectives, detailed implementation plans, monitoring, and continuous improvement, whereas Malaysia's guidelines place greater emphasis on general roles and responsibilities, and provide less construction-specific operational detail.

In terms of safety management personnel, both countries define relevant roles and competency requirements; however, Japan provides more detailed regulatory provisions under its Industrial Safety and Health framework. Japan's organisational structure places the project manager in overall responsibility for safety and health management, supported by clearly defined supervisory roles. In contrast, Malaysia relies on designated safety officers and supervisors with prescribed competency requirements, with comparatively less integration of safety responsibilities into broader project management structure. Similarly, although both countries require the establishment of safety and health committees, Japan specifies committee composition, functions, and operational processes in greater detail, whereas Malaysia provides more general requirements. This difference may affect the consistency and effectiveness of committee implementation across construction sites.

Training and education systems further distinguish the two countries. Japan provides structured safety education for workers, including foreign workers, supported by continuous training programmes, safety work cycles, and formal technical training systems. These mechanisms provide a systematic basis for developing safety awareness and worker competency. In contrast, Malaysia has less structured requirements for the technical training and competency development of foreign construction workers, and training initiatives may be implemented inconsistently across construction sites. This difference may contribute to variations in safety performance, particularly given Malaysia's high dependence on foreign workers in low-skilled construction occupations.

Overall, both countries exhibit broadly similar regulatory frameworks at the macro level, substantial differences emerge at the micro level in terms of regulatory specificity, implementation mechanisms, training systems, monitoring, and behavioural guidance. Malaysia's framework primarily establishes institutional roles and responsibilities, whereas Japan extends these requirements through detailed operational procedures, continuous improvement mechanisms, and behaviour-oriented safety practices. This distinction provides a plausible explanation for Japan's more consistent long-term reduction in construction

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fatalities, although differences in accident reporting and classification systems must also be considered.

The findings highlight that effective safety performance depends not only on the existence of regulations but also on the depth of implementation, integration of safety into organisational and worker behaviour, and continuous refinement of safety management systems. Future research should empirically examine how behaviour-based safety practices and code-of-conduct frameworks influence safety performance at the construction site level.

Table 5: Findings Towards Construction Safety Related Regulations Between Japan and Malaysia

Description	Japan	Malaysia
Current Construction Accident Trends	The casualties steadily declined after 1972; continuously remained at low level until present.	No significant reduction in construction casualties, with signs of increasing fatalities.
Major Construction Fatalities	Falls from height	
Occupational Safety and Health Act and its Purpose	JISHA 1972 to secure the workers' safety and health in the workplace; to create a comfortable work environment. (Stated in Article 1)	OSHA 1994 to secure the safety, health, and welfare of workers at the workplace.
Laws and Guidelines Governing Construction towards Fall Protection	More specific is the type of safe body hardness and the circumstances in which it needs to be worn.	General information on safe hardness; the circumstances in which it needs to be worn is not specified.
Countermeasures against Falls from Scaffolding	The rule that a qualified person/scaffolder must perform the work is similar	
	Both passive preventive and proactive measures have been implemented, such as the promotion of handrail-first erection methods.	Basic passive precautions were implemented, such as the installation of vertical and horizontal body lifelines and temporary guardrails as edge protection.
Qualification of Construction Works based on ILO-OSH-2001	The COHSMS guidelines are fully compliant with international standards and have been re-edited to suit the construction industry.	Guidelines OSHMS compliant with international standards, it does not include health and safety goals in it.
Guidelines for Principal Contractor	In section 5 of the COHSMS guide, 16 clear basic requirements are set out for main contractors on construction sites.	Brief guidance for general contractors in paragraphs 92-114 of the OSH in construction industry (management).
Safety Management Organisation on Construction Sites	The overall safety and health manager must be the same person who controls the overall execution of the construction site. All subcontractors are responsible for the safety of their own contracted work.	The main contractor must employ a SHO or SSS to manage safety matters in relation to the workplace, including all trades on the construction site.

The Requirement to Establish of Safety Committee at Workplace	The requirement of the safety committee is specified such as the composed of the members to join the committee.	The requirement of such a safety committee is not specified.
Safety Management Programme on Construction Sites	The guidelines list out 13 safety management programmes to be undertaken by contractors at construction sites.	The guidelines do not list out safety management programmes to be undertaken by contractors at construction sites.
Skilled Training System for Foreign Workers	Mandatory.	Not mandatory.

Conclusion

The findings of this study indicate that Japan and Malaysia have broadly comparable occupational safety and health regulatory frameworks at the macro level; however, important differences emerge in the implementation and operationalisation of these requirements at the construction site level. Japan demonstrates a more structured and systematic approach characterised by detailed regulatory provisions, integrated safety management responsibilities, structured training and education, continuous monitoring, and behaviour-oriented safety practices. These mechanisms are consistent with Japan's sustained long-term improvement in construction safety performance, although differences in accident reporting and classification systems must be considered when interpreting the comparative results.

The findings suggest that strengthening safety training and education for construction workers, including foreign workers, represents an important strategy for improving construction safety performance in Malaysia. Japan's experience indicates that regulatory requirements are more likely to support sustained safety improvement when they are accompanied by comprehensive safety management programmes, clearly defined operational procedures, competency development, and continuous monitoring and improvement.

Several practices adopted in Japan could be considered within the Malaysian context. These include strengthening competency-based safety training requirements, promoting greater contractor commitment and self-initiative in safety management, and developing more detailed and industry-specific guidelines to support consistent implementation at the site level. The integration of structured technical training and competency development for foreign workers is particularly relevant given their substantial presence in the Malaysian construction workforce.

Overall, Malaysia has established a fundamental institutional framework for occupational safety and health; however, further improvement is required in the implementation, monitoring, enforcement, and behavioural integration of safety requirements. The comparison demonstrates that effective construction safety management depends not only on the existence of regulations but also on the mechanisms through which those regulations are translated into routine site-level practices. Japan therefore provides a valuable reference for Malaysia and other developing countries seeking to strengthen construction safety governance, improve workforce competency, and achieve sustained reductions in construction-related accidents and fatalities.

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