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Original Article

Safety performance in Malaysia's manufacturing industry: unveiling safety challenges and initiatives

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ABSTRACT

Introduction: Despite the rapid growth of the manufacturing industry, data from relevant agencies indicate the rising number of accidents that highlights the recurrence and criticality of safety issues that have remained unresolved over the years. This study aims to identify the key challenges faced by the manufacturing companies in ensuring safe workplace, as well as the specific initiatives undertaken at the organizational level to mitigate occupational risks.

Methods: This qualitative research was adopted a case study approach, whereby the data were collected through semi-structured interviews involving 12 informants from seven manufacturing companies located in Selangor, Malaysia. The participants included safety practitioners directly involved in workplace safety functions. In addition to interviews, this study also incorporated document analysis to triangulate and validate the findings.

Results: Two main themes were identified in this study: safety challenges and safety initiatives. The safety challenges that identified are related to work processes, the working environment, and individual factors. Notably, these challenges are commonly experienced across all participating companies. In response, the companies have introduced several safety initiatives, which include improving work processes and increasing management involvement in safety practices.

Conclusion: Safety challenges can hinder an organization's ability to maintain effective safety performance. However, with preventive planning and the implementation of appropriate safety initiatives, these challenges can be addressed, thereby supporting the continuous improvement and sustainability of safety performance within the organization.

Keywords: Manufacturing Industry, Safety Challenges, Safety Initiatives

Introduction

The manufacturing industry in Malaysia has been experiencing rapid growth since the early stages of the nation's industrialization.[1] This sector is the second-largest contributor to Malaysia's GDP, following the service sector. The significance of the manufacturing sector is evident in its ability to attract more approved projects and create numerous job opportunities. According to the Malaysian Investment Development Authority (MIDA) report published in February 2025, approximately RM120.5 billion was invested in Malaysia's manufacturing sector in 2024, leading

to the creation of around 87,695 jobs. While this growth reflects the sector's strong economic contribution, the rapid expansion of the manufacturing industry is often associated with an increase in occupational safety issues, requiring greater emphasis on effective safety management practices. According to the report by the Malaysian Investment Development Authority (MIDA), approximately RM120.5 billion was invested in the Malaysia's manufacturing sector in 2024, generating around 87,695 job opportunities. While investment in the sector continues to grow, the rapid expansion of the manufacturing industry has also been linked to an increase in safety-related issues.[2]

Workplace safety remains a critical concern in Malaysia's manufacturing sector, which continues to report excessively high rates of occupational accidents despite ongoing national safety regulations and initiatives.[3] The occupational accident statistics reported to the Department of Occupational Safety and Health (DOSH) from 2020 to 2022 revealed a consistent trend, with the manufacturing sector recorded as the highest number of workplace accidents among the top five sectors. In 2020, the sector reported 4,506 cases, followed by a slight decline to 4,269 in 2021, before rising again to 4,514 cases in 2022.[4] The trend continued in 2023 with 10,335 occupational injury cases in the manufacturing sector.[5] These alarming statistics reveal a persistent gap between policy implementation and on-ground safety performance, suggesting that current safety interventions may not be sufficiently effective or well-integrated at the organizational level.[6] Despite the various frameworks and enforcement mechanisms introduced by regulatory bodies, the impact depends mainly on how individual manufacturing companies critically identify safety challenges and effectively implement appropriate preventive measures.[7]

Therefore, the key challenges faced by manufacturing companies in ensuring workplace safety, as well as the specific initiatives undertaken at the organizational level to mitigate occupational risks were explored. By focusing on firm-level practices, this research seeks to provide insights into the practical realities of safety management and contribute to the development of more effective, context-specific strategies for accident prevention within the manufacturing industry.

Methods

A qualitative research design by using a case study method to explore safety challenges and initiatives in the manufacturing sector is adopted. Data were collected through semi-structured interviews with an expert who directly involved in the workplace safety, such as Safety and Health Officers (SHOs), Safety Executives, and Safety Engineers. The qualitative study offers methodological flexibility, which allows participants to articulate responses based on their individual interpretations and contextual understanding of the subject matter.[8] Aligned with ontological and epistemological assumptions that regard reality as socially constructed and interpreted through the lived experiences and worldviews of individuals, semi-structured interviews are particularly suited for capturing nuanced, in-depth data.[9]

Demographic of of 12 informants participated in the study is presented in Table 1, representing seven manufacturing companies located in Selangor, Malaysia. The participating companies were selected through purposive sampling, and the informants were identified and nominated by their respective organizations to serve as representatives. Participation was entirely voluntary, with each informant providing written consent permitting the recording of their feedback. To maintain confidentiality, no personal identifiers were disclosed, and each informant was assigned an anonymous code. These companies operate across various industries, including automotive parts, agrochemicals, and plastic manufacturing. Each interview was conducted face-to-face at the respective informant's workplace and had an average duration of approximately one hour. Of the 12 informants, 7 informants (58%) are directly

involved in safety and health functions, 3 informants (25%) are responsible for environmental and sustainability functions within the Safety, Health, and Environment (SHE) management structure, and the remaining 2 informants (17%) hold production and administrative roles related to production activities.

All interviews were audio-recorded with informed consent and transcribed verbatim. Beside interview session, the document analysis was also used to support the findings. The transcripts were then imported to NVivo software version 14 to assist in data management and analysis. To support the data analysis process, qualitative data analysis software was utilized to efficiently organize and manage the data collected. The advancement of software technology has enabled qualitative researchers to adopt computerized tools for data coding and management.[10]

For data analysis, thematic content analysis was conducted. All interview transcripts were first read several times to ensure familiarity with the data. Relevant statements related were then coded, and were grouped into broader categories. These categories were refined to capture the underlying patterns within the data. The themes were then reviewed across all transcripts to ensure consistency and alignment with the data

Table 1: Demographic information of informant

Company	Business nature	Informant	Position	Year(s) of experience
A	Agrochemical	1	Safety Health Officer	2
B	Automotive parts	2	Senior Safety Health Executive	11
C	Automotive parts	3	Head of Safety and Health Department	26
D	Automotive parts	4	Safety and Health Engineer	2
		5	Sustainability Executive	2
E	Plastic manufacturing	6	Production Manager	18
		7	Administration Executive	6
F	Plastic manufacturing	8	Safety Coordinator	7
		9	Environmental Executive	10
		10	Sustainability Executive	2
G	Automotive parts	11	Safety Health Officer	7
		12	Assistant Manager Safety, Security and Health	2

Results

Based on the thematic content analysis conducted, there were two themes identified, namely safety challenges and safety initiatives as illustrate at Figure 1. The interview findings highlighted several opportunities for enhancing safety performance within the organization, particularly in light of the ongoing challenges encountered over time. To address these challenges effectively, the development of a comprehensive and proactive safety strategy is crucial. Such an approach not only supports the achievement of organizational objectives but also reinforces the commitment to protect employees' safety as well as their well-being.

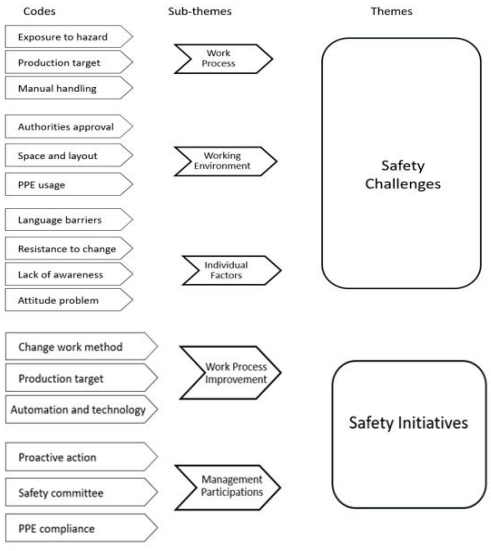

Figure 1: Themes, subthemes and codes from thematic analysis.

From the data analysis, two main themes emerged in examining safety performance within the manufacturing industry: safety challenges and safety initiatives. The themes of *safety challenges* comprise three subthemes that emerged from the data: work processes**,** working environment, and individual factors**.** These subthemes represent the primary barriers to achieving optimal safety performance and highlight the multidimensional nature of safety-related issues in manufacturing settings.

Theme one: Safety Challenges

Safety challenges are common in the rapidly growing industry, especially in a dynamic and fast-paced manufacturing industry, to meet increasing demand and production target.

1) Work Process

Work process activities are among the key challenges faced by organizations in maintaining safety performance. Certain job tasks involve hazardous elements such as noise and chemical exposure, and these activities are essential to production and cannot be substituted or eliminated.

"We have tried our best to reduce the noise, but somehow, there are activities that we cannot avoid."

Because these work processes are necessary to complete production tasks, the workers involved are exposed to hazards that increase the risk of injury or health problems. The company is aware of this issue and considers it as one of the major challenges in maintaining safety performance. Therefore, standard operating procedures (SOPs) for each work process are strictly followed to reduce the severity of potential risks.

Additionally, another informant explained that their production activities involve the use of chemical materials, which are known to be hazardous. However, to maintain product quality, the use of these chemicals are unavoidable and this situation also becomes a challenge for the company to address the safety issues while performing the task.

"Chemical hazard during manual insertion of the components, we use chemicals like Isopropyl alcohol to clean up the board as part of the process. It's about 28 chemicals we use during the production process."

Moreover, the loads carried by workers during task performance are also a risk that can harm them, as they handle the task manually or with limited machine assistance.

"The workers (3-4 people) are there to carry 25 kg of bags. 120 bags per day minimum. It's one of the issues that the production wants to reduce."

The company faces constraints due to a limited number of workers available to handle heavy tasks, even with the assistance of equipment such as forklifts. The use of forklifts is one of the company's strategies to minimize hazards and reduce physical strain on employees.

"There are only our employees who carry heavy parts. Even though we have a forklift, to transfer from pallet to production line, they have to carry 20 kgs".

Physical strain is a common injury among workers, especially when handling heavy loads or working in awkward positions. The effects of these strains can appear in different ways—some may occur suddenly and be felt immediately, while others may take a longer time to develop and become noticeable only after repeated exposure to the same task.

As mentioned by Informant 3, their company uses forklifts to assist workers in handling heavy loads. Similarly, Informant 2 also highlighted the use of forklifts as part of their work process. However, the use of forklifts can also create safety challenges. Operating forklifts in the production area increase the risk of accidents, such as hitting workers passing by or materials falling during movement. Not only that, in line with their green initiatives, the company has invested in battery-powered forklifts, which produce no engine noise compared to older diesel models. While this reduces environmental impact and supports green

practice and sustainability goals, it also introduces a new safety challenge. The quiet movement of battery-powered forklifts makes them less noticeable, increasing the risk of accidents, especially if workers are unaware that a forklift is approaching. In contrast, the louder noise of diesel forklifts previously served as a warning to nearby workers.

Previously, we used diesel forklifts, which not only produce emissions but also contribute to noise hazards; however, at the same time, they serve as a warning to people in the vicinity of the forklift movement. However, here we use a battery-operated forklift, but this type of forklift is silent, which makes people in the surrounding not alert to the forklift movement".

The findings also discovered that high production targets contribute to the challenges in maintaining safety performance. In such situations, workers may experience burnout and a higher risk of accidents due to long working hours aimed at meeting increased production demands.

"The workers basically are stressed to achieve the production target. Every day, the production target varies and is based on the demand from the customer".

As the company expands its business, customer demand also increases, placing additional pressure on workers in the production line to fulfill these higher targets. This situation creates stress and urgency, which can lead to unsafe working conditions, especially when tasks involve hazardous materials or processes.

Essential work processes often involve hazardous elements such as noise, chemical exposure, and manual handling of heavy loads, which cannot be avoided due to their importance in production. While companies have implemented control measures like standard operating procedures and equipment, such as forklifts, to reduce risks, these solutions also bring new safety concerns, such as silent battery-powered forklifts increasing accident risk due to a lack of noise. Additionally, limited manpower and high production targets contribute to worker stress, fatigue, and a higher likelihood of injuries.

2) Working Environment

Other safety challenge that identified in this study relates to the working environment within the organization**.** The working environment encompasses various factors, including physical conditions, temperature, noise levels, and overall atmosphere**,** all of which can significantly impact employees' ability to perform their tasks safely. In some organizations, elevated workplace temperatures have been observed, creating discomfort for employees, particularly when they are required to wear personal protective equipment (PPE). This discomfort may reduce compliance with safety protocols**,** potentially increasing the risk of heat-related stress and workplace accidents.

"The company has already provided PPE, for example, earmuffs and safety shoes. However, the workers do not want to wear this".

An informant from Company A mentioned that workers gave various reasons for not wanting to wear personal protective equipment (PPE), highlighting a challenge in ensuring consistent safety compliance on the ground.

"The workers complain about the hot temperature while they're wearing the PPE. They need to wear coveralls, gloves, and a mask at all times, so they feel uneasy about that".

Employees who fail to wear personal protective equipment (PPE) while performing their tasks are more vulnerable to workplace hazards and risks, consequently increasing the likelihood of accidents and injuries. Furthermore, non-compliance with safety protocols imposes an additional burden on supervisors, who must spend time monitoring and correcting unsafe behaviours. Such non-value-added activities divert time and resources away from more productive supervisory responsibilities.

"The supervisor needs to check production regularly to ensure workers wear the PPE. It is difficult for us to monitor every 24 hours since we have already highlighted the consequences of not wearing PPE such as hearing loss or injury to them".

Not only that, the challenge of managing the space for production activity also became a safety issue. The limited space and a load of materials are a

nightmare for the organization, as they need to ensure everything is in order, particularly in positioning employees safely within the workspace. For some companies, poor planning for receiving materials and shipping the product will swarm the production plant and create potential hazards such as falling objects or fires. Additionally, the issue of space limitations was raised by three different companies, as outlined below:

"We also have issues with falling items due to crowded places with stock and packaging items."

"There's a problem with the space. When we're using a big machine, we have to put it in a 10x10 space. But we don't have enough space here."

"The main issue is space limitation. So, it's very hard for us to adjust the layout".

Furthermore, the findings revealed that two companies faced challenges in managing safety due to delays in obtaining approval from the relevant authorities. This poses a significant challenge, as prolonged decision-making processes hinder their ability to implement timely improvements and comply with safety requirements. For instance, Informant 2 from Company B highlighted that poor indoor air quality is a concern in office areas. However, efforts to improve ventilation are constrained by fire-retardant wall regulations, which require extensive procedures and multiple layers of approval for any renovation or structural adjustments.

"Indoor air quality in office plant is basically poor due to high CO2 [….] We are facing some constraints for improvement due to this fire-retardant wall, it requires too many procedures for any renovation and adjustment."

Similarly, Informant 12 from Company G emphasized the complexity of dealing with external authorities, noting that safety-related issues involving external parties often require lengthy discussions and bureaucratic processes before any action can be taken.

"We have to discuss a lot with external authorities. When it comes to external issues, they take time and process to bring them up".

These cases illustrate how regulatory procedures can delay the implementation of necessary safety measures, thus potentially exposing workers to ongoing occupational risks. Although the company understands the obligation to comply with all legal and regulatory requirements, dealing with the authorities requires careful planning and cannot be completed within a short period of time.

3) Individual Factor

Last safety challenge highlighted by the informants relates to individual factors, particularly employee attitudes. Some employees demonstrate a lack of discipline and fail to adhere to safety instructions, which can lead to misconduct and accidents. Although the company has provided sufficient safety awareness, training, guidance, and established standard operating procedures (SOPs) to prevent workplace incidents, the effectiveness of these measures ultimately depends on employee compliance. When safety protocols are disregarded, it is their personal attitudes and behavior that are to blame rather than a lack of organizational effort.

"On safety - Sometimes, misconduct is common. We can give them awareness and teaching. But then, it depends on themselves. Whether they want to follow or they don't. But mostly, it's the misconduct".

Lack of awareness and exposure to safety protocols also poses a safety challenge among employees. This indicates that some employees are indifferent to understanding and participating in safety activities, despite being given the platform. Although the company has provided safety training, guidance, and standard operating procedures (SOPs), some employees remain uninformed or uncertain about the correct steps to take during emergencies.

"We need to focus on awareness among the employees. Most of our employees are local. Introducing a new procedure can be quite challenging, especially when it

relates to safety. For instance, during the audit, when we inquired about the proper procedure for handling an accident, the employees were uncertain and provided varied responses. There is a lack of awareness towards the safety procedure among employees".

At the same time, organizations that employ foreign workers often face additional safety challenges due to language and cultural differences. These barriers can hinder effective communication and understanding of safety procedures. In many cases, foreign workers require over a month of training to fully grasp the safety procedures necessary to perform their tasks correctly. For example, Company F reported challenges in managing safety compliance among foreign workers due to the difficulty in understanding and following even basic instructions.

"The culture of Bangladeshi workers is quite challenging for us to handle, and it takes around 3-4 months for them to understand the instructions clearly. We need to educate and train them until they can follow the instructions."

Moreover, managing senior workers presents unique challenges, particularly when it comes to implementing new safety measures. This group often resists change and shows limited interest in adapting their work practices, even when such changes are aimed at improving workplace safety. One reason for this resistance is their long tenure in the company, which may lead to a sense of comfort with existing routines.

"The employees are quite difficult to accept any changes, especially among experienced workers or senior workers who have already worked with this company for a long time. They resist the change since they said they will retire within the next 2 or 3 years, so they don't want to change or follow any changes".

In summary, safety challenges originate not only from workplace conditions but also from individual-related factors. These challenges are compounded by the continuous exposure of workers to such conditions in their daily tasks, thereby increasing their susceptibility to potential hazards.

Theme two: Safety Initiatives

The findings revealed that two primary safety initiatives have been adopted to mitigate workplace safety issues: enhancing work processes and strengthening management involvement in safety management. It is anticipated that these initiatives will contribute to improved safety performance, thereby reducing workplace hazards and minimising potential harm to employees.

1) Work process improvement

The informant identified the improvement in the work process as one of the valuable activities to maintain or improve safety performance. Company A, for example, has changed its work method by minimizing the manual handling process with machine assistance, so the workers are less exposed to ergonomic hazards.

"More towards goods handling, such as work posture, static posture, like standing. Basically, we use mechanical tools such as forklifts to lift the drums and IBC."

On a different view, lifting activity becomes one of the main work activities for the workers in company E. Consequently, the company must adopt creative approaches to manage ergonomic hazards faced by employees. The use of suction machines and pallet jacks during work processes has proven effective in reducing exposure to these ergonomic risks.

"The works need 3-4 people there to carry 25 kg of bags. 120 bags per day minimum. I've suggested to the management to make a suction bag. So, they use a suction and cut it off. Instead of 4 people there, maybe 1 or 2 shifts without lifting the load […….] for lifting activities, they're just pushing it on the pallet jack and pulling it on the machine."

Additionally, this improvement not only reduces the exposure towards hazards but also maximizes the use of the existing green initiatives in the organization.

"The usage of this machine will perhaps reduce ergonomic issues and, at the same time, fully utilize the solar energy that we installed."

In addition to mechanical tools, optimizing the use of existing resources can also help minimize potential hazards during work processes.

"For lifting activities, currently we propose the use of a double pallet, so that instead of the workers needing to bend before lifting the items, the double pallet makes the process easier and less hazardous to the workers. For the standing process, we provide a chair for them to sit for tasks such as screwing, inserting, and soldering."

"For lifting work, the workers work in pairs or work in a buddy system".

The above initiatives would not be possible if management prioritized production targets over safety. Ergonomic hazards are common in manufacturing processes but are often overlooked because they do not cause immediate or acute effects. Moreover, even when specific tasks require manual handling, the organization considers alternative methods to mitigate the associated risks. For example, in tasks involving manual handling, measures such as limiting the weight of loads and implementing job rotation systems have been introduced to reduce the physical strain on employees and promote safer working conditions.

"Workers need to manually handle the materials in bags that are less than 35 kg only in the production area. Only the mixing part needs manual handling by the workers. It's not a severe task to handle since it only requires a one-hour job before the workers change their task or job rotation. The job rotation is one of the company's practices, also practiced in the machine area."

The findings further suggest that improvements in work processes through the adoption of automation and technology contribute significantly to managing ergonomic risks and promoting employee health. These advancements reduce workers' exposure to hazards during task execution. Companies C and D have successfully integrated automation and robotics into their operations, recognizing the benefits of these technologies.

"When we make this new chrome plating, we make it an automation whereby we use robots to replace pistons to do that process. In the process, this plating line will release fumes. The fumes are from the chromic acid. If you inhale that chromic acid and don't wear PPE, you can cause your health in terms of safety."

Company C has implemented robotic systems within its work processes to reduce workers' exposure to potential hazards, which has also led to increased operational efficiency and output. Similarly, Company D has adopted automation technologies aimed at minimizing manual handling tasks, thereby improving ergonomic conditions and enhancing workplace safety. Both companies demonstrate how technological interventions can serve dual purposes, enhancing safety while simultaneously boosting productivity.

"This year (2024), we will install the robot, not only for tackling ergonomics issues, but also for optimizing the cycle time of production. At the same time, it reduces the number of workers at one workstation."

Reducing the number of workers involved in machine operations and work processes can indirectly decrease their exposure to hazards, thereby lowering the incidence of workplace injuries and accidents. Such incidents not only affect employees' well-being but also disrupt organizational productivity.

In the effort to mitigate hazards within organizational work processes, the introduction of new procedures may unintentionally give rise to potential risks for employees. Such outcomes are often unavoidable due to factors such as budgetary constraints and limited resource availability.

"In the past, from the process of collecting zinc and aluminum waste, we sent it to the scrap area. The contractor will collect and finish the process there. Now, from the process, we send it to the compactor machine. We will have an operator who will operate that machine to make it into a cube. The press machine compromises the safety of the workers. Of course, it is a hazard [……] of course, the safety of the workers should be looked into."

2) Management commitment

The management must consistently remain proactive in safety activities to ensure the company demonstrates a forward-thinking approach by implementing necessary precautions for anticipated incidents, particularly when work processes involve hazards and risks. Informant 9 from Company F acknowledges that, to date, no accidents or incidents related to chemical spillage have occurred; however, the company has already established measures to address such situations should they arise.

"So far, no situation (spillage case) has happened, but I prepared the spillage kit as a precaution."

The study indicates that compliance with statutory laws and regulations by top management is a critical factor in promoting strong safety performance and sustaining a favorable safety record. The recent amendment to the Occupational Safety and Health Act 1994 (OSHA 1994, Amendment 2022) underscores a shift towards self-regulation, thereby placing increased accountability on organizations to actively monitor and ensure adherence to regulatory requirements. This development requires a proactive approach by management to embed legal compliance into the organizational safety culture.

"So far, the company complies with all the law requirements, such as committee meeting, HIRARC, training, including refresher training. PPE is also provided".

Additionally, informants acknowledged that the safety committee mandated under the Occupational Safety and Health Act 1994 (OSHA 1994) serves as an effective communication platform between management and employees. In the event of any issues, this committee, comprising representatives from both employers and employees, provides a structured forum for discussing and addressing potential gaps in safety practices.

"Safety committee means that we have representatives from the workers' side. So, basically, that's communication. If we are not satisfied with the safety issue, then we must discuss".

The findings further indicated that the safety committee also functions as a channel through which employees can express concerns related to work, particularly those involving safety. Directly approaching management may be challenging for employees due to bureaucratic barriers or time constraints.

However, the safety committee meetings in accordance with legal requirements must be conducted quarterly, offering a valuable opportunity for employees to raise such issues in a structured and supportive environment.

"There are some gaps in information dissemination from management discussion to the employees' level. The information is disseminated through email, notice board, bulletin, and also through the safety and health committee. This lack of information leads to misunderstanding. Sometimes the workers are also afraid to voice out their ideas and opinions to the upper level because of a lack of a proper channel".

In addition to establishing a safety committee in accordance with the requirements of OSHA 1994, workers are also provided with personal protective equipment (PPE) as part of the organization's safety initiatives. This measure aims to safeguard employees from potential hazards encountered during task execution. Table 2 outlines the efforts made by different companies to provide PPE to their employees as part of their safety initiatives.

Table 2 Statement on PPE as a safety initiative

Statement
"We have different types of hazard control, such as using the PPE, and management control, such as procedures and policies".
"They are (employees) all protected by the PPE".
"So far, the company complies with all the law requirements, such as committee meetings, [……]. PPE is also provided".
"The company has already provided PPE, for example, earmuffs and safety shoes".

The provision of personal protective equipment (PPE) by the company not only ensures regulatory compliance but also serves as a risk mitigation strategy within the broader safety management framework. According to the hierarchy of risk control, PPE represents the least effective control measure when compared to substitution, engineering controls, and administrative strategies. However, it remains a practical and cost-effective solution. To enhance the effectiveness of PPE in contributing to exemplary safety performance, additional measures are necessary. These include selecting PPE that appropriately fits each employee, delivering comprehensive training on correct usage, and ensuring proper storage and maintenance.

"The training will be provided to the workers on what type of PPE they need to wear based on the chemical production".

Company A, in its annual report, highlighted its proactive measures to prevent safety issues related to the handling of chemical materials. These measures include the enhanced use of personal protective equipment (PPE) during the production process.

"The mandatory use of PPE with safety goggles and an additional layer of visor for all personnel involved in chemical handling activities"

In addition to providing training on the proper use of personal protective equipment (PPE), the company also implements ongoing quality monitoring by appointing a designated staff member responsible for ensuring that all PPE remains safe, functional, and ready for use.

"In production, there are aprons, masks, gloves, different types of gloves, safety shoes. We have a person in charge of PPE to manage and monitor the usage of PPE if needed to change and replace".

The findings revealed that the company's safety initiatives, which include improving work processes and strong management involvement, are crucial for addressing the safety challenge and enhancing workplace safety. In the manufacturing sector, the use of various equipment, machinery, and materials often involves specific hazards, demanding strict safety measures and compliance with established safety protocols.[11] Companies have reduced ergonomic risks by using machines, automation, and new technologies, which also help improve productivity and support sustainability efforts.

Management plays an essential role by following safety laws and creating a culture of safety. Safety committees facilitate better communication between workers and managers, enabling employees to raise safety concerns more easily. Providing personal protective equipment (PPE) is another crucial step, even though PPE is the least effective way to control risks. Prior research has demonstrated that the use of PPE significantly increases when individuals are aware of potential hazard exposure, particularly when the associated risks are perceived to lead to severe consequences.[12] Additionally, proper training, regular checks, and ensuring the right fit make PPE more effective.

Overall, these efforts, from improving work methods to management commitment and employee involvement, they help create safer workplaces while maintaining productivity and legal compliance.

Discussion

Safety-related issues are critical in the context of a rapidly growing manufacturing industry, particularly when organisations strive to meet increasing production demands and targets.[13] Without a good strategy, addressing these challenges can be difficult, potentially hindering the achievement of organisational goals and placing workers' safety at risk. Managing such safety challenges is a complex situation yet integral aspect of effective safety management. Organizations must consider multiple factors and perspectives before making any strategic decisions. Profit-driven companies often prioritize operational efficiency and increased productivity

to meet their business objectives. However, they are simultaneously responsible for addressing safety concerns, which must remain a top priority. Therefore, strategies to manage these challenges must be carefully developed to ensure that safety standards are upheld without compromising overall business performance.[14]

Recognizing the safety challenges encountered, the company has proactively strengthened their strategies to mitigate associated risks through the implementation of targeted safety initiatives. These initiatives are intended not only to uphold compliance with relevant laws and regulations but also to reflect voluntary commitment from internal stakeholders. Measures undertaken include improving work processes and actively participating in management to cultivate a safe working environment.[15] A safe working environment contributes to reducing accident rates and serves as an indirect indicator of strong safety performance within the company.[16]

The safety challenges encountered by the organization are not construed as impediments to productivity; instead, they serve as critical catalysts for organizational learning and continuous improvement, prompting the refinement of work processes, reinforcement of safety measures, and the cultivation of a proactive safety culture. A continuous improvement culture that enables employees to participate in safety management actively allows the organization to enhance workplace safety, improve productivity, and ensure the long-term sustainability of occupational health and safety initiatives.[17]

Limitations

This study has several limitations. First, it focused only on the manufacturing industry within the state of Selangor, which may limit the generalizability of the findings to other regions or sectors. Second, the qualitative data collected involved only management representatives, specifically those at the executive and managerial levels. As a result, the findings reflect only the perspectives of management and do not represent the views of employees at other levels. Hence, future studies could be expanded to include the perspectives of other stakeholders.

Conclusion

The findings revealed three main challenges faced by the company: work processes, the working environment, and individual worker-related factors. A key concern is that the production process itself exposes employees to hazards, such as chemical exposure. These risks are further compounded when aspects of the working environment intensify the hazards, increasing the likelihood of harm while tasks are being performed. Moreover, the company's efforts to maintain safety are complicated by worker-related issues, including limited safety awareness, communication barriers, and resistance to change, all of which affect how safety measures are understood and applied in daily work.

Two key safety initiatives to address existing challenges were identified: improving work processes and strengthening management involvement through sustained support and commitment. These initiatives form essential pillars in overcoming workplace safety issues. Although they may appear straightforward, their successful implementation requires careful planning, consistent organizational commitment, and active participation from all levels of the workforce to ensure acceptance by stakeholders. While some commitments are motivated by regulatory requirements, full compliance is not always achieved, particularly given the self-regulatory framework of occupational safety laws in Malaysia. Demonstrating compliance not only reflects a company's dedication to responsible operational practices but also enhances its corporate image and contributes positively to organizational performance, especially in safeguarding the safety and well-being of stakeholders.

Recommendation

Future research should aim to include a broader range of employee perspectives to provide a more comprehensive understanding of the topic. Additionally, further studies could examine other

industries with higher safety concerns or focus on the small and medium enterprise (SME) sector, which plays a significant role in Malaysia's manufacturing industry.

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