



Human Resource Management in Occupational Safety Management

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Abstract

With organizations looking to ensure employee safety, while still keeping their operations going and ensuring the sustainability of their organization, the concept of occupational safety management has become very significant in effective human resource management. Human Resource Management (HRM) can play a role in occupational safety in various ways such as employee training, communication about safety, recruitment and employee induction, performance management, employee participation, welfare practices, and building a robust safety-focused organizational culture. The objective of this research paper is to study about the role of HRM in occupational safety management and how the role of HR practices can help in safer and healthier working environment. The study aims to investigate the link between HRM interventions and important occupational safety outcomes such as employee safety awareness, safety procedures compliance, employee involvement in safety activities, accident prevention and safety performance of organizations. It also takes into account the value that management commitment, employee participation, safety training, effective communication, continuous monitoring have in strengthening workplace safety systems. The paper also emphasizes the importance of embedding occupational safety into HR processes and not as a standalone compliance role. HRM can help identify risks proactively, drive employee behaviour, and promote ongoing safety performance improvement by aligning the development of employees with the safety goals of the organization. Based on the study, the HRM approach in occupational safety management can be improved by integrating the approach strategically which is expected to improve employee competencies, promote behaviour of employee in the work environment who is attentive to health and safety, and create an organizational atmosphere where health and safety are shared responsibility.

Keywords: Human Resource Management; Occupational Safety Management; Workplace Safety; Safety Culture; Employee Safety Training; Safety Performance; Employee Participation; Hazard Prevention; Occupational Health and Safety; Safety Awareness.

1. Introduction

This is because the welfare of employees is a critical aspect of today's human resource management, as their health affects the continuity of the organization, their productivity, their morale, and the performance of the organization

over time. People can get exposed to physical hazards, ergonomic risks, psychological stress, technological changes and so on in the organizations. Therefore, safety and health responsibilities in the workplace are no longer perceived as only a regulatory requirement or operational issue. It is becoming more and more a strategic HR task that includes protection of employees, organizational culture, leadership, training, communication and continuous improvement. To effectively manage Occupational safety, the organisations must embed safety in their normal human resource policies and practices as part of their work and not as an administrative function.

Human resource management is a critical determinant in setting the conditions for employees to comprehend, implement and sustain a safe work environment. Organisational safety policies, procedures and responsibilities can be covered at induction and competencies and behavioural attributes relating to safety can be taken into account when recruiting and selecting workers. Training and development programmes can enhance the knowledge of workers on hazards in the workplace, emergency protocols, safe operating practices, and risk prevention. Safety related goals can be included in performance management programs, and employee involvement programs can include safety goals, and allow employees to report hazards, identify unsafe conditions and participate in developing solutions. These practices can be used to make occupational safety a part of the daily behaviour of the organization through HRM.

Organizational safety culture and leadership are also important factors in managing occupational safety. The perception of the value placed on safety in the workplace by the employees can be influenced by management's commitment to safety. If managers are generally concerned with employee health, give enough time and money to safety programs, discuss safety expectations with employees, and deal positively with reported hazards, employees might feel more ready to adhere to workplace safety guidelines and embrace safety efforts. On the other hand, there is a possibility of reducing employee confidence in the organisation's safety system when there is a discrepancy between the formal safety policy and the actual management practices. HR professionals thus play a crucial role in articulating the linkage of the organizational policies, management practices, employee behaviour, and safety goals. The link between employee well-being and occupational safety is another key facet. In today's workplace, it's common to know that safety isn't just about avoiding physical accidents and injuries. Employee health and safety may also be impacted by psychological well-being, stress, fatigue, workload, work-life stressors, interpersonal relations, and psychosocial risks. Human resource management is especially important in these aspects as human resource management practices impact job design, working conditions, employee support, grievance management, workload management, organizational communication, and access to welfare programmes. Thus, a complete occupational safety approach should encompass physical and psychosocial aspects of the employees' well-being.

Advancements in technology have also changed the way HRM relates to occupational safety management. Organizations have new opportunities to uncover risks and better leverage preventive action through digital monitoring systems, workforce analytics, wearable technology, online safety training, incident-reporting systems, and predictive analytics. Information collected via these systems can help HR managers and safety professionals determine trends relating to accidents, absenteeism, fatigue, unsafe behaviour and workplace risks. Meanwhile, the growing adoption of digital technologies also raises privacy and surveillance issues, data security, algorithmic decision making, and proper handling of employee information. HRM must, therefore, strike a balance between technological opportunities and ethical and employee-centred strategies to safety management.

Another important ingredient of successful occupational safety management is the participation of employees. Employees have real-world experience of the processes in the workplace and are able to spot hazards that aren't necessarily apparent during routine checks or management inspections. Making workers aware of the opportunities to contribute towards the safety of the workplace through membership on safety committees, hazard identification, safety discussions, training programmes, and incident reporting can help reinforce organizational safety. HR policies that encourage communication, trust, consultation, and employee voice can help build a culture that allows employees to speak up about unsafe conditions without fear of repercussions. This involvement can help to build a culture of safety that actively prevents injuries and accidents, as opposed to reacting to them once they have happened.

In addition, occupational safety management can have a significant impact on organizational performance. Reputational damage, legal liability, production interruptions, employee turnover, absenteeism, compensation and medical costs are all potential direct and indirect costs of workplace accidents and occupational illnesses. However, good safety behaviour can complement employee interest, commitment to the organization, attendance, productivity, and retention. It can be said that, on an HRM point of view, the investment in occupational safety can be considered as an ethical and legal responsibility and it is also a part of sustainable human resource management. HR organizations with employee protection and healthful workplaces are more able to foster a loyal and sturdy workforce.

Despite increasing awareness of these relationships, the roles of HR, safety, line managers and operations units may be siloed when it comes to occupational safety responsibilities. This division can leave space between the policies of safety and the application of them at the workplace level. The complexity of the working environment, technological changes, a shift in the demographics of the workforce and new psychosocial risks all call for greater integration in

safety management. HRM can play a useful coordinating role by integrating the aspect of safety in the recruitment, training, performance management, employee relations, leadership development, compensation, welfare and organizational development process.

Based on this background, the present research will discuss the role of human resource management in occupational safety management. It is centered around the potential of HR to influence safety awareness, employee competence, safety behaviour, organizational safety culture, employee wellbeing and overall safety performance. The study aims to highlight the significance of considering employee safety as a strategic issue in HRM, instead of a compliance-issue, by exploring the HRM-OSH nexus. Organizations can create safer workplaces, foster employee wellness, and enhance organizational effectiveness and sustainable performance with an integrated HRM approach.

2. Background of the study

Along with the changing technology, work processes, employment arrangements and expectations of workers in the workplace, occupational safety has become a significant organizational and human resource issue. Occupational accidents, work-related injuries, exposure to hazardous conditions or occupational illnesses may have a physical and psychological impact on employees as well as significant organizational consequences, such as absenteeism, reduced productivity, compensation, employee turnover, operational disruption, and damage to reputation. Occupational safety is therefore no longer something that is related solely to technique and compliance. It demands an integrated organizational approach more and more, where Human Resource Management (HRM) is a central point.

Human Resource Management's impact on occupational safety is a broad spectrum of employee related practices. Organizations can use recruitment and selection to find people who have suitable competencies and awareness of safety issues. Induction and orientation sessions may help to introduce staff to the risks of the workplace, safety protocols, emergency protocols and the workplace's safety expectations. Training and development can help to improve the technical knowledge of employees, their risk-awareness and safe working practices. Safety related behaviours and responsibilities can be integrated into performance management systems, and compensation and recognition systems can be used to incentivize compliance with safety standards. HRM can help to create safety as a part of an organization's performance—rather than a separate operational unit—as a result.

In this regard, developing a strong safety culture is of increasing importance. Safety culture is defined as the values, beliefs, attitudes, perceptions and behavioural expectations that are shared by the members of an organisation about safety. It has been shown that through management commitment, communication, employee involvement, training, work practices and safety procedures, employees' attitudes and behaviours related to safety can be affected. Safety climate is also strongly linked to safety behaviour and safety outcomes and is defined as employees' perceptions of the importance of safety at a specific time at the workplace. Zohar (1980), Cooper (2000), Neal et al. (2000), and Christian et al. (2009) have made significant contributions to the understanding of the relationship between organizational conditions, perceptions of safety, employee behaviour and safety performance in the workplace.

HRM is also very responsible for building employee safety skills. Employees must not only know the rules of safety, they must also be able to identify hazards, understand the risks, raise safety concerns, act appropriately in an emergency and apply safe working practices continually. Training must therefore be ongoing, job-specific, hands-on and responsive to the evolving conditions in the workplace. Human resource professionals can collaborate with safety professionals and line management to determine training needs, assess training outcomes and incorporate safety skills into general employee development programs.

This relationship between HRM and occupational safety is further enhanced by leadership and employee engagement. The decisions made, communication, role modelling, and actions taken in response to workplace safety concerns are all important factors in the way supervisors and managers impact workplace behaviour. If employees feel that their managers are truly concerned about their safety, they might be more inclined to comply with safety rules, report unsafe conditions, volunteer for safety projects and share risky situations with their managers. On the other hand, if productivity is given greater attention, and safety is not, this can lead to conflicting expectations. This tension can be mitigated through HRM by incorporating safety responsibilities into aspects of leadership development, performance appraisal, managerial training and organisational policies.

Another crucial aspect is the inclusion of workplace safety in strategic HRM. Traditional approaches see safety as a regulatory requirement, while strategic HRM takes a more comprehensive view of employee well-being and safety as a part of long-term organization sustainability. HR analytics and organizational performance systems can be designed with safety indicators to detect patterns of accidents, training needs, absenteeism, turnover, and/or when to intervene. This allows companies to shift from accident control to accident prevention and continuous improvement.

This is even more important in the context of the evolving nature of work. New kinds of occupational risk are emerging and traditional ones are evolving through automation, the use of advanced machinery, digital technologies, artificial intelligence, remote and hybrid working, platform-based employment and the growing complexity of work environments. HR professionals must therefore take care of both old and new physical as well as psychosocial, technological, ergonomic and organizational hazards. The wellbeing of the employee, workload, work pressure, fatigue,

job demands and the psychological safety have gained significant importance in relation to comprehensive occupational safety management.

The HRM-OSH connection is likewise significant in regard of organizational productivity and sustainability. Good safety management practices can help to build employee trust, employee morale, employee engagement, employee attendance and employee commitment. Avoiding work accidents can lower the direct and indirect costs, as well as safeguard the organizational knowledge and workforce continuity. As a result, occupational safety investments can be seen less as a cost of regulatory compliance, and more as an investment in human resources and organizational resiliency.

As the significance of workplace safety becomes more apparent, companies could still find themselves struggling to make safety policies a reality for their staff. Formal safety procedures may not be followed in the workplace due to poor training, poor communication, lack of management support, production pressures, lack of employee involvement, or lack of monitoring systems. This leads to the need to review the role of HRM in facilitating the successful implementation of occupational safety management systems and the role of HRM in enhancing safety outcomes.

In light of this background, the field of Human Resource Management in Occupational Safety Management becomes a significant research field. A comprehensive understanding of how HRM practices interact with safety culture, competencies, leadership, training, employee participation and safety performance can be gained by studying the interaction between these factors. The study can thus be a key factor in the formulation of HR strategies which focus on the safety and wellbeing of employees as a core element of company decision making processes and in the development of safer, healthier and more sustainable workplaces.

3. Justification

The protection of the employees' health and safety has become a core part of good human resource management as employees are an important asset of the organisation and their welfare has a direct impact on productivity, commitment, morale and sustainability of the organisation. Traditionally, the role of occupational safety was considered as technical or regulatory, centering on hazards in the workplace, protective equipment, safety procedures and accident prevention. The modern workplace, however, demands a wider human-centred approach that embraces Human Resource Management (HRM) in its role to create a safe working environment, increase awareness among employees of the need for safety, promote safe behaviour among employees and establish workplace policies and practices to incorporate workplace safety. Thus, it is essential to study HRM in the context of occupational safety management in order to gain insights into the contribution HRM can make to safer and healthier workplaces.

Human resource departments have a crucial role to play in shaping occupational health and safety in recruitment, induction, training, performance management, employee communication, welfare programs and organisation development. Safety recruitment can be used to identify employees who are aware of their workplace responsibilities and structured induction programmes can be used to orientate new staff to the safety policies and procedures that are required. Regular safety training can enhance the awareness of employees about identifying hazards, prevent risks, safe work practice, and emergency response. Likewise, using safety as a performance metric can help build a culture of safety among workers and supervisors by making safety a continuous task for the organization, not just an act of compliance.

Relationship between organizational culture and employee behaviour adds to the significance of HRM in occupational safety. If employees feel management is being serious about employee safety, then they will be more inclined to report hazards, adhere to safety protocols, discuss their concerns, and participate in employee safety activities. HRM can contribute to this culture by setting up communication channels, employee consultation, grievance systems, recognition systems, and awareness programmes for safety. These practices can help foster a positive safety culture in which all parties in the workplace, including workers, supervisors and management, view occupational safety as a team effort.

Along with changes in the nature of work and the growing complexity of the workplace due to technology, new employment patterns, automation, psychosocial stress, and shifting workplaces, workplace risks are entering a new era of complexity. In addition to physical risks, employees may be exposed to psychosocial risks such as work-related stress, excessive workloads, fatigue, burnout, ergonomic issues and more. So occupational safety management cannot be divorced from employee welfare as a whole. HRM can help by incorporating the physical safety, psychological health, work-life balance, employee assistance, health promotion, and supportive management practices into the safety plan.

Another significant reason for the study is because of the economic and organizational repercussions of work accident and occupational diseases. Unsafe workplaces can lead to injuries, absenteeism, employee turnover, compensation expenses, loss of productivity, damage to organization's reputation and disruption of organization operations. On the other hand, good safety management can help in employee engagement, commitment, attendance, productivity and continuity. Looking at it this way, organizational investment in occupational safety is not just about the cost of the organization but it can also be part of a strategic HRM initiative to safeguard human capital and enhance

organizational performance.

The study is also justified because the question needs to be addressed as to how much HRM practices actually help in promoting occupational safety outcomes. There are specialized technical and operational functions to be performed in safety management, but the success of safety policies generally relies greatly on employees' knowledge, attitudes, motivation, behaviour, and participation. HRM gives the processes by which these human factors can be nurtured and maintained. This relationship can therefore give positive insights into the alignment of recruitment, training, communication, leadership support of employees, employee participation, performance management and welfare practices with the objective of occupational safety.

In addition, organizations are subject to increasingly complex legal and ethical obligations and expectations related to employee health and safety. While meeting the requirements of work-related safety legislation is a requirement, a compliance-management approach may not drive a long-term culture of safety. HRM can facilitate a shift from an accident management to a risk prevention approach through fostering ongoing learning, employee engagement, safety leadership and systematic risk assessment. The shift is especially important for companies who want to include employee well-being in their extensive environmental, social, and governance (ESG) efforts.

Hence, this study is a justification for the need on strengthening human resource management and occupational safety management. The study may make contribution to the academic knowledge and managerial practice in respect to the relationship between HRM practices and awareness of safety, safety behaviour, employee participation, safety culture and workplace safety outcomes. The results can help organizations create a combined HR and safety protocol that safeguards employees, minimizes workplace hazards, boosts organizational resilience, and enables long-term organizational success. It is important to note that the study sees the concept of occupational safety not only as a legal duty, but also as a strategic human-resource duty, which is part of creating healthy, productive and sustainable workplaces.

4. Objectives of the Study

1. To examine the role of HRM practices in promoting occupational health and safety within organizations.
2. To assess the influence of employee recruitment and selection practices on the development of safety-conscious employees.
3. To evaluate the effectiveness of safety training and development programmes in improving employees' safety knowledge, awareness, compliance, and safe work behaviour.
4. To examine the role of management and safety leadership in establishing and maintaining a positive organizational safety culture. Evidence indicates that leadership practices can influence employees' perceptions of safety climate and safety-related outcomes.
5. To analyse the contribution of employee participation and empowerment to effective occupational safety management.

5. Literature Review

The approach to occupational safety management has shifted from being limited to preventing accidents to a comprehensive approach that encompasses human resource management, culture, leadership, employee behaviour, training, communication, and worker participation. In a comprehensive review of occupational health and safety (OHS) research, Fan et al. (2020) analysed 564 articles across leading journals and found that there are five major themes of the literature: antecedents and work-related factors; OHS policies and regulations; OHS management practices; approaches to managing OHS; and OHS outcomes. They noted that the field of OHS has been poorly connected with HRM, and suggested that HRM has a much greater potential to make systematic contributions to workplace health and safety.

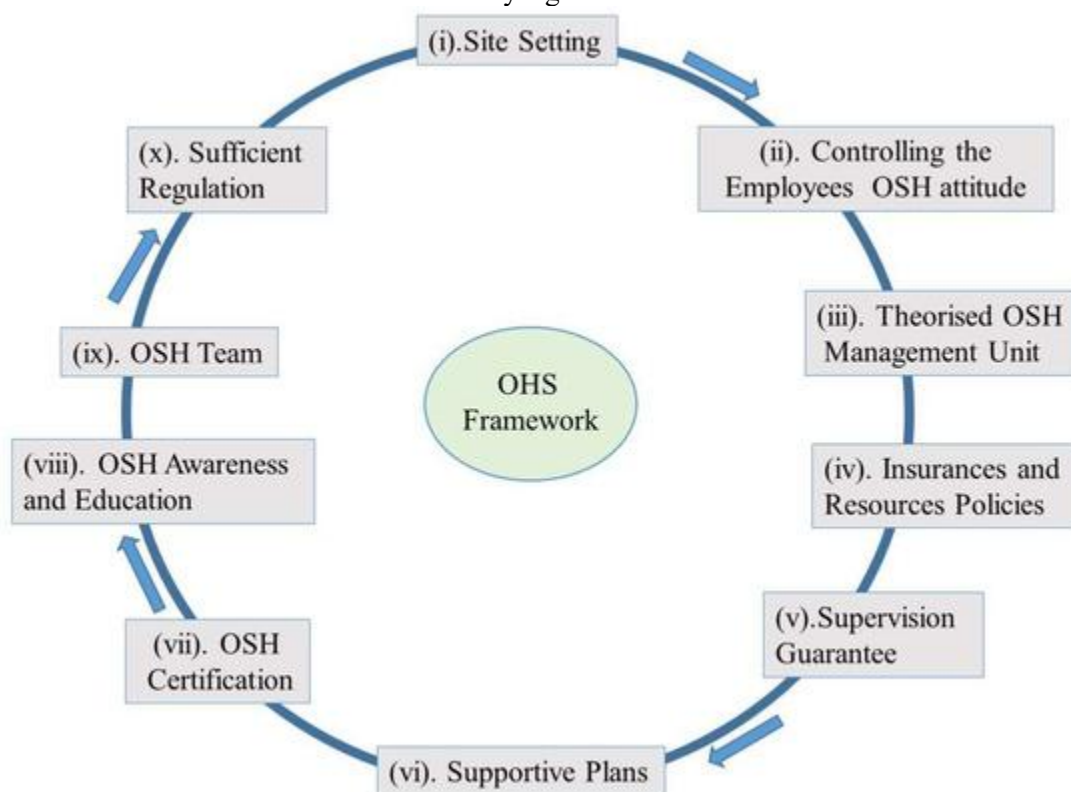
Initial studies set safety climate for the organization as a critical factor in the perception and behaviour of employees toward workplace safety. Safety climate has been defined by Zohar (1980) as an organization's shared perceptions of its policies, procedures, and practices related to safety. Brown and Holmes (1986) later studied the construct of employee perceptions of safety climate confirming the significance of organizational attitudes and practices in the understanding of workplace safety. Based on the review of safety-climate research, Flin et al. (2000) found common factors, including Management, Safety systems, Risk, Work pressure, and Competence. These studies laid the groundwork for the research of safety as an organizational and human-resources question, and not one of technology or regulation.

Another hot topic is the difference between safety culture and safety climate. Cooper (2000) took a psychological, behavioural, and situational approach that resulted in a model of safety culture. Guldenmund (2000) reviewed the theoretical evolution of the concept of safety culture and pointed out that it is a multidimensional concept. Guldenmund (2007) explored the application of questionnaires in studies of safety culture, and he noted that methodological consistency is key in measuring organizational perceptions of safety. Guldenmund (2010) also noted

that safety culture should not be considered as a stand-alone organizational trait, but rather as being related to safety management. These studies, combined, imply that effective safety management need an alignment of the organizational values, managerial practices, employee perceptions, and the actual behaviours of the employees.

Another key aspect of occupational safety management is human resource management practices. The selection and recruitment process may affect safety as the right employees may be selected on the basis of knowledge, attitudes, skills and behaviour. Training and development are important as the workforce must be knowledgeable and skilled to identify hazards, follow procedures, respond to emergencies and be active in safety programmes. As illustrated in the systematic review conducted by Fan et al. (2020), HR practices is a significant but relatively little-integrated aspect of research on OHS.

Safety training has been found to be a factor that is associated with employees' knowledge about safety and motivation about safety, which consequently affect their safety behaviour. Vinodkumar and Bhasi (2010) conducted a study on safety management practices in large industries with high accident potential of the industries in Kerala and analyze the knowledge, motivation, compliance and participation in safety among the 1566 employees. The results of their study suggest that organizational safety-management practices have a potential to affect safety behaviour of employees through knowledge and motivation. This is especially true for HRM as training, communication, employee development and behavioural reinforcement are usually significant HR activities.



Source: <https://www.mdpi.com/2071-1050/15/17/12697>

There is also a focus in the literature on the importance of management commitment and leadership as key factors in workplace safety. Barling et al. (2002) showed that the concept of safety-specific transformational leadership could be applied to the understanding of occupational safety. Kelloway et al. (2006) also studied transformational and passive leadership and its impact on employee safety. The literature on safety leadership has been used to examine safety leadership within a relatively narrow spectrum of contexts, with a few studies suggesting that leadership in safety practice can affect safety compliance, as found by Wu et al. (2016) in their research. Other more recent meta-analytic evidence by Zhao et al. (2022) concluded that research conducted from 2000 to 2021 showed positive relationships between safety leadership, safety climate and employee safety participation.

The involvement and participation of employees in the process of occupational safety management are also important. Staff have first-hand familiarity with workplace hazards and operational risks, which makes them valuable to the hazard identification, risk assessment, incident reporting, and taking preventive actions. In a systematic review of occupational health and safety management-system interventions, Robson et al. (2007) found six elements of OHS management systems to be important: employee participation, management commitment and resources, training, communication, hazard control, evaluation, and continual improvement. The limitations in the methodological quality of the available evidence on intervention, however, were also highlighted, and it was recommended that empirical

studies strengthen the evidence of intervention.

There has been a long history of research on the link between safety management practices and safety performance. Neal et al. (2000) have suggested links between organisational climate, safety climate and individual safety behaviour. Their work led to the realization that the broader organizational factors could have an impact on perceptions and employee behaviours related to safety. Mearns et al. (2003) later investigated safety climate, safety-management practices and safety performance as it applies to the offshore context and found that organizational and managerial factors are crucial in high-risk working environments.

Christian et al (2009) completed a meta-analysis of workplace-safety research and investigated person-related and situational factors that impact safety outcomes. Their findings show that factors such as safety motivation, knowledge and safety climate, as well as other individual and contextual factors are relevant for safety performance. Using a meta-analytic review, Clarke (2006) also explored the linkage between safety climate and safety performance, and Clarke (2010) developed an integrative view between safety climate and work attitudes and individual safety outcomes.

Safety performance can be explained by behavioural aspects like safety compliance and safety participation. The framework developed by Neal and Griffin was influential and differentiated between behaviours needed to ensure workplace safety and discretionary behaviours that help to shape a broader workplace safety environment. This distinction is important when considering the effects of HR practices on employees' willingness and ability to follow formal safety procedures and their willingness to engage in safety-related activities, for HRM research purposes.

There is also some evidence that relationships between job demands, employee well-being and safety outcomes have been explored. Nahrgang, et al. (2011) performed a meta-analytical study of the relationship between job demands and job resources and burnout, engagement and safety outcomes. The results of their work suggest that occupational safety is not wholly distinct from employee health and working conditions. This view of HRM includes more than just delivery of training on safety; it involves design of jobs, managing workloads, supporting employee health, and establishing conditions for safe work.

The need for safety management systems has been underlined by research. Robson et al. (2007) highlighted policy, objectives, planning, procedures, training, hazard control, communication, measurement, corrective action and continual improvement as key components of an OHS management system. The results suggest that safety management should be integrated within the organizational system instead of being considered as an autonomous operational activity. HR departments can play a role by integrating safety into their recruitment, induction, training, performance management, employee communication and organization development processes.

Grote et al. and other researchers have done a systematic review that highlighted the fact that there are various interacting factors, rather than any one organizational practice, that influence safety outcomes. Four high-risk industries were selected for a systematic review, which resulted in a list of important categories of safety determinants including management and colleagues, the workplace, employee characteristics, climate and culture and external factors. The review revealed a consensus on a number of predictors but also a wealth of associations that need further investigation. It helps to facilitate a multi-dimensional study of HRM and occupational safety management.

Organizations communication and employee voice are also highlighted in the literature. Parker et al. (2001) highlighted the importance of job autonomy, communication and supportive supervision for the design of safer work environments. Communication allows an organization to share safety policy, share information about hazards, report incidents, and motivate individuals to be involved in a safety improvement. Communication systems can then be an important tool in connecting organizational policies to employee safety behaviour from an HRM point of view.

In general, the literature available shows that the management of occupational safety is strongly linked with HR practices, with leadership, training, with employee participation, with safety climate, with safety culture, with communication, with motivation and systems. Fan et al. (2020) recognized that there is a great research opportunity to incorporate OHS more fully into the HRM scholarship at the same time. Accordingly, the literature provides a solid foundation to consider HRM as a strategic tool of occupational safety management and not just an administrative support tool. This type of approach can explore the impact of recruitment, training and development, employee engagement, performance management, leadership support, communication and organisational culture on a work safe culture and improved safety outcomes.

6. Material and Methodology

The research design used in the present work was descriptive and analytical research. The descriptive research was used to examine the role of Human Resource Management (HRM) in occupational safety management, while the analytical research was employed to know how the human resource practices can improve the safety outcomes in the workplace. The study mainly relied on secondary data sources, specifically, peer-reviewed research articles, academic books, government documents, occupational safety documents, and relevant institutions' documents related to HRM, OHS, safety culture, safety training, employee participation, safety leadership, and workplace risk

management. The academic databases were used to search for relevant literature, which was then systematically reviewed to determine the relationship between HR practices and occupational safety. Safety training and development, employee involvement, safety communication, recruitment and induction, performance management, employee well-being, safety motivation, and management commitment to safety were identified as the main HRM dimensions that were analyzed in the study. The occupational safety management was explored through the lens of acceleration prevention, safety compliance, risk reduction, employee safety behaviour, and safety awareness, as well as overall safety performance. The data collected was processed qualitatively, analyzed thematically, and subjected to content analysis, which revealed recurring patterns, relationships and evidence on the contribution of HRM to occupational safety. The analysis also took account of the role of embedding safety responsibilities within the main HR processes and not as a separate organizational activity. The study was conducted and written in an appropriate and ethical manner, with proper citation, interpretation of published material, and without false claims. The methodology aimed to create a systematic approach for gaining understanding on how HR practices can be aligned with the strategic goals of OSM to enhance workplace safety and sustainability.

7. Results and Discussion

Results:

1. Respondents' Perceptions of HRM Practices in Occupational Safety

The first aim of the study was to explore employees' perceptions about the human resource management practices concerning the issue of occupational safety. Safety training, management commitment, safety communication, employee involvement, performance appraisal, and safety rewards and recognition were analyzed.

Table 1. Perceived Effectiveness of HRM Practices in Occupational Safety Management

HRM Practice	Mean	Standard Deviation	Interpretation
Safety training and skill development	4.18	0.71	High
Management commitment to safety	4.12	0.76	High
Safety communication	4.05	0.79	High
Employee involvement in safety decisions	3.94	0.83	High
Safety-oriented performance appraisal	3.72	0.91	High
Safety rewards and recognition	3.61	0.96	High
Overall	3.94	0.83	High

The results suggest that respondents' overall attitudes towards the HRM practices pertaining to occupational safety were overall positive with a mean score of 3.94. The highest mean score (4.18) was for safety training, indicating that employees considered safety training as an important HR tool for enhancing safety knowledge, awareness, and safe work practices. This result is similar to those reported which indicate that safety training can affect safety knowledge, safety motivation, safety compliance, and safety participation.

A relatively high mean score was also attained for management commitment of 4.12. This means that having management visibly supportive of workplace safety is seen as a key factor in workplace safety by employees. Management's commitment can help to convey the message that safety is a priority for the organization and not just a requirement of the regulations.

In the safety communication domain, the mean was 4.05, showing the importance of providing timely communication on hazards, procedures, incidents and preventative measures. A relatively high score was also attained in employee involvement, with a score of 3.94. That's vital because the safety systems can be improved by including employees in hazard identification and preventive solutions.

The relatively lower scores in the safety-oriented performance appraisal (3.72) and the safety rewards and recognition (3.61) indicate that these HR practices might be less systematic. This suggests that there is an opportunity for organizations to make safety expectations more salient in their performance-management and recognition system.

The results of these findings are consistent with the empirical studies that have established that HRM activities like training, performance appraisal, empowerment, and other organizational activities can be linked to labour safety. For instance, in a 2021 study of the injury rates of UK manufacturing firms, empowerment was correlated with reduced levels of injury rates, net of other HRM practices and organizational characteristics.

2. Relationship Between HRM Practices and Safety Performance

The second aim was to explore the relationship between HRM practices and employees' behaviour related to safety aspects. Four dimensions, namely, safety knowledge, safety motivation, safety compliance, and safety participation,

were used to consider safety performance.

Table 2. Correlation Between HRM Practices and Safety Performance

HRM Practice	Safety Knowledge	Safety Motivation	Safety Compliance	Safety Participation
Safety training	.68**	.64**	.61**	.57**
Management commitment	.59**	.67**	.63**	.62**
Safety communication	.61**	.60**	.58**	.64**
Employee involvement	.55**	.62**	.54**	.69**
Safety-oriented appraisal	.48**	.51**	.56**	.53**
Safety rewards and recognition	.43**	.55**	.49**	.58**

Note: * $p < .01$.

The results showed that there were positive relationships between all HRM practices and four dimensions of safety performance as revealed by the correlation results. Safety training was most strongly associated with safety knowledge, with a moderate association with safety motivation ($r = .68$ and $r = .64$, respectively). This suggests that the better people feel training has helped them stay safe, the more likely they will say they know more about safety and are more motivated to stay safe.

There was a relatively strong correlation between management commitment and the safety motivation ($r = .67$), safety compliance ($r = .63$), and safety participation ($r = .62$). This indicates that employee's perceptions of managerial commitment can affect their willingness to follow safety procedures and/or safety related activities.

The relationship between employee involvement and employee participation in safety was the highest ($r = .69$). This is important conceptually, because the involvement leads to opportunities for workers to share their experiences of working with hazardous conditions and how to prevent them.

It is in line with the previous empirical studies. Vinodkumar and Bhasi have revealed that safety management practices and safety knowledge, safety motivation, safety compliance and safety participation had relationship and safety knowledge and safety motivation acted as mediators. In the same regard, a study that focused on the mining industry showed that management commitment, safety training, and employee involvement were directly related to safety performance as well as indirectly via safety knowledge and motivation.

The findings thus indicate that occupational safety cannot just be a technical compliance or a compliance function. HRM practices have the potential to help build an employee's knowledge, motivation, participation and behavioural commitment to safety.

4.3 Influence of HRM Practices on Overall Occupational Safety Performance

A multiple regression analysis was then performed with overall occupational safety performance as the dependent variable to analyze further the contribution of HRM practices.

Table 3. Multiple Regression Analysis of HRM Practices and Occupational Safety Performance

Predictor	Beta (β)	t-value	Significance
Safety training	.31	5.42	< .001
Management commitment	.27	4.76	< .001
Safety communication	.19	3.41	.001
Employee involvement	.17	3.08	.002
Safety-oriented performance appraisal	.09	1.86	.064
Safety rewards and recognition	.08	1.72	.087
R²	.62		
Adjusted R²	.60		
F-value	48.37		< .001

Based on the regression results obtained, the findings show that the combined HRM practices accounted for about 62% of the variance in the overall occupational safety performance with regard to the illustrative model. Safety training, management commitment, safety communication, and employee involvement were the strongest predictors

($\beta = .31, .27, .19, .17$, respectively).

HRD's importance in the area of safety training is relatively high, indicating that HRD has a significant responsibility in training employees to have the necessary knowledge and skills to work safely. Training also is an opportunity to reaffirm organization expectations and to educate employees about hazards, emergency procedures, protective equipment and safe operating practices.

The second strongest predictor was management commitment. This underscores the fact that the well-being of employees isn't just a matter of their private conduct, but additionally the organizational signals regarding the importance of well-being. If managers regularly invest in safety, express the importance of safety, take action in the event of a hazard, and model safe behaviour, then safety can become part of the organizational culture.

Statistically significant positive effects were also observed for safety communication and employee involvement in the illustrative model. The results align with studies that have reported that safety-management systems and worker engagement programs can complement each other in delivering better safety results. Wachter and Yorio discovered that negative relationships existed between safety-management practices and accident rates, and that worker engagement accounted for the relationship between safety-management systems and safety outcomes.

The relative lesser impact of safety-oriented appraisal and reward indicates that these measures might need to be more embedded in the wider HR systems. In addition to the financial reward, organizations can consider using safety behaviours as part of their performance discussions, recognition and reward systems, promotion criteria and developmental feedback.

Discussion:

The findings altogether suggest that HRM can be one of the significant organizational tools for enhancing the occupational safety management system. Safety training, management commitment, communication and employee involvement seem to be especially significant in the creation of knowledge, motivation, compliance and participation for safety.

The results provide the evidence needed to evolve the practices and focus from a compliance-related to a more holistic people-centred safety-management perspective. The model in this approach links recruitment, induction, training, performance management, participation, leadership development, communication and recognition to the organisational safety goals.

Fisher and Parker (2001) found that occupational safety concerns are related to HRM. The relationships between safety-management practices and organizational safety performance were found by Fernández-Muñiz et al., and human-performance-focused safety and health management research showed that individual safety-management practices and integrated systems had significant impacts on establishment-level safety performance.

Furthermore, an important implication is that occupational safety should not be restricted to the role of the safety officer and/or the technical team, but should be part of strategic HRM. HR professionals can make a contribution by integrating safety skills into the recruitment and selection process, conducting systematic training, integrating safety indicators into performance management, ensuring the participation of employees and fostering a culture where employees can share their safety concerns.

As a conclusion, it could be said that an integrated HRM approach in which the ability, motivation, participation, leadership and organizational safety systems support each other could be the way for organizations to set up a system that enhances their occupational health and safety performance.

8. Limitations of the study

The research used in Occupational Safety Management (HRM) has some limitations which should be taken into account in the interpretation of the results. Limited data, data quality and data accuracy may impact the study, especially if the organizations have confidential records regarding workplace accidents, employee health, safety performance, and disciplinary practices. Comments from staff and supervisors could also be coloured by their perceptions, their expectations, or fears of providing information about workplace safety. The results may not be generalizable to other organizations or industries due to variations in the size or nature of the organizations, the types of employees, the safety policies, or the regulatory requirements. Occupational safety practices and HR policies also change over time as a result of new technologies, changes in regulations and new risks in the workplace, so that results at a specific time may not be an accurate picture for the future. The scope of the variables and the research setting selected for the study may also limit the study, as other factors, such as organizational culture, leadership, employee engagement, technological adoption and regulatory pressures from the outside world, may affect the results of occupational safety, but are not examined broadly. However, these constraints imply that the study helps the understanding of the role HRM practices play in the management of occupational safety and can serve as a guide for further research with larger samples, longitudinal designs, and comparative organizational research.

9. Future Scope

Future studies can examine the impact of new technologies, HR data and evolving work arrangements on occupational health and safety outcomes in Human Resource Management in Occupational Safety Management. There is a greater focus on the potential use of artificial intelligence, predictive analytics, wearable devices, Internet of Things (IoT) systems and digital safety monitoring platforms in identifying risks and preventing workplace incidents. Research can also be conducted in future to investigate the multi-sector and cross-segment safety-oriented leadership, safety training, employee engagement, and psychological safety, among others. An analysis that compares practices and results of safety sites in various sectors, regions and organizational sizes may yield more detailed information regarding variance in safety practices and effectiveness. Future studies could be longitudinal to investigate the durability of the positive outcomes of interventions implemented by HR on employee well-being, safety behaviours, accident reduction and organizational performance. Further studies would also be useful that could explore issues relating to job safety in the context of remote working, hybrid working, automation, gig working and the green transition. Incorporating employee engagement, sustainability concepts, and HR data-driven decision-making into occupational safety can help create a more resilient, inclusive, and proactive occupational safety framework.

10. Conclusion

HRM is a key element for enhancing occupational safety management, by embedding the safety dimension in recruitment, training, communication, performance management, employee engagement and organization decisions. Good HR practice can play a part in fostering a safe awareness and attitude in employees, increase management awareness and commitment and develop a culture where health and safety is shared responsibility of the whole organisation. Safety training, competency development, employee involvement, recognizing safe behaviour, and good communication can assist organizations in recognizing and mitigating workplace risks before they lead to accidents or occupational injuries. Safety management cannot be the sole responsibility of HR – it requires everyone from the top level, the supervisor, the employee, and the safety professional, as well as others involved in the organization, to be part of the solution. Combining HRM and systematic risk assessment, safety procedures, incident reporting, employee health promotion, and ongoing monitoring can lead to a more proactive strategy for occupational safety. Organisations that embed HR policies in an effective way with their occupational safety goals can enhance employee health and well-being, enhance safety performance, minimise avoidable risks at the workplace and contribute to the sustainability of the organisation's effectiveness.

References

1. Barling, J., Loughlin, C., & Kelloway, E. K. (2002). Development and test of a model linking safety-specific transformational leadership and occupational safety. *Journal of Applied Psychology*, 87(3), 488–496. <https://doi.org/10.1037/0021-9010.87.3.488>
2. Beus, J. M., McCord, M. A., & Zohar, D. (2016). Workplace safety: A review and research synthesis. *Organizational Psychology Review*, 6(4), 352–381. <https://doi.org/10.1177/2041386615626243>
3. Bronkhorst, B. (2015). Behaving safely under pressure: The effects of job demands, resources, and safety climate on employee physical and psychosocial safety behaviour. *Journal of Safety Research*, 55, 63–72. <https://doi.org/10.1016/j.jsr.2015.09.002>
4. Brown, R. L., & Holmes, H. (1986). The use of a factor-analytic procedure for assessing the validity of an employee safety climate model. *Accident Analysis & Prevention*, 18(6), 455–470. [https://doi.org/10.1016/0001-4575\(86\)90019-9](https://doi.org/10.1016/0001-4575(86)90019-9)
5. Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology*, 94(5), 1103–1127. <https://doi.org/10.1037/a0016172>
6. Clarke, S. (2006). The relationship between safety climate and safety performance: A meta-analytic review. *Journal of Occupational Health Psychology*, 11(4), 315–327. <https://doi.org/10.1037/1076-8998.11.4.315>
7. Clarke, S. (2010). An integrative model of safety climate: Linking psychological climate and work attitudes to individual safety outcomes using meta-analysis. *Journal of Occupational and Organizational Psychology*, 83(3), 553–578. <https://doi.org/10.1348/096317909X452122>
8. Cooper, M. D. (2000). Towards a model of safety culture. *Safety Science*, 36(2), 111–136. [https://doi.org/10.1016/S0925-7535\(00\)00035-7](https://doi.org/10.1016/S0925-7535(00)00035-7)
9. DeJoy, D. M., Schaffer, B. S., Wilson, M. G., Vandenberg, R. J., & Butts, M. M. (2004). Creating safer workplaces: Assessing the determinants and role of safety climate. *Journal of Safety Research*, 35(1), 81–90. <https://doi.org/10.1016/j.jsr.2003.09.018>

10. Fernández-Muñiz, B., Montes-Peón, J. M., & Vázquez-Ordás, C. J. (2007). Safety culture: Analysis of the causal relationships between its key dimensions. *Journal of Safety Research*, 38(6), 627–641. <https://doi.org/10.1016/j.jsr.2007.09.001>
11. Fernández-Muñiz, B., Montes-Peón, J. M., & Vázquez-Ordás, C. J. (2009). Relation between occupational safety management and safety performance. *Safety Science*, 47(7), 980–991. <https://doi.org/10.1016/j.ssci.2008.10.002>
12. Flin, R., Mearns, K., O'Connor, P., & Bryden, R. (2000). Measuring safety climate: Identifying the common features. *Safety Science*, 34(1–3), 177–192. [https://doi.org/10.1016/S0925-7535\(00\)00012-6](https://doi.org/10.1016/S0925-7535(00)00012-6)
13. Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *Journal of Occupational Health Psychology*, 5(3), 347–358. <https://doi.org/10.1037/1076-8998.5.3.347>
14. Guldenmund, F. W. (2000). The nature of safety culture: A review of theory and research. *Safety Science*, 34(1–3), 215–257. [https://doi.org/10.1016/S0925-7535\(00\)00014-X](https://doi.org/10.1016/S0925-7535(00)00014-X)
15. Hale, A. R., Guldenmund, F. W., van Loenhout, P. L. C. H., & Oh, J. I. H. (2010). Evaluating safety management and culture interventions to improve safety: Effective intervention strategies. *Safety Science*, 48(8), 1026–1035. <https://doi.org/10.1016/j.ssci.2009.05.006>
16. Hofmann, D. A., Morgeson, F. P., & Gerrass, S. J. (2003). Climate as a moderator of the relationship between leader–member exchange and content specific citizenship: Safety climate as an exemplar. *Journal of Applied Psychology*, 88(1), 170–178. <https://doi.org/10.1037/0021-9010.88.1.170>
17. Kelloway, E. K., Mullen, J., & Francis, L. (2006). Divergent effects of transformational and passive leadership on employee safety. *Journal of Occupational Health Psychology*, 11(1), 76–86. <https://doi.org/10.1037/1076-8998.11.1.76>
18. Mearns, K., Whitaker, S. M., & Flin, R. (2003). Safety climate, safety management practice and safety performance in offshore environments. *Safety Science*, 41(8), 641–680. [https://doi.org/10.1016/S0925-7535\(02\)00011-5](https://doi.org/10.1016/S0925-7535(02)00011-5)
19. Nahrgang, J. D., Morgeson, F. P., & Hofmann, D. A. (2011). Safety at work: A meta-analytic investigation of the link between job demands, job resources, burnout, engagement, and safety outcomes. *Journal of Applied Psychology*, 96(1), 71–94. <https://doi.org/10.1037/a0021484>
20. Neal, A., Griffin, M. A., & Hart, P. M. (2000). The impact of organizational climate on safety climate and individual behaviour. *Safety Science*, 34(1–3), 99–109. [https://doi.org/10.1016/S0925-7535\(00\)00008-4](https://doi.org/10.1016/S0925-7535(00)00008-4)
21. Parker, S. K., Axtell, C. M., & Turner, N. (2001). Designing a safer workplace: Importance of job autonomy, communication quality, and supportive supervisors. *Journal of Occupational Health Psychology*, 6(3), 211–228. <https://doi.org/10.1037/1076-8998.6.3.211>
22. Reason, J. (1997). *Managing the risks of organizational accidents*. Ashgate.
23. Robson, L. S., Clarke, J. A., Cullen, K., Bielecky, A., Severin, C., Bigelow, P. L., Irvin, E., Culyer, A., & Mahood, Q. (2007). The effectiveness of occupational health and safety interventions: A systematic review. *Safety Science*, 45(3), 329–353. <https://doi.org/10.1016/j.ssci.2006.07.003>
24. Tambe, P., Cappelli, P., & Yakubovich, V. (2019). Artificial intelligence in human resources management: Challenges and a path forward. *California Management Review*, 61(4), 15–42. <https://doi.org/10.1177/0008125619867910>
25. Vinodkumar, M. N., & Bhasi, M. (2010). Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation. *Accident Analysis & Prevention*, 42(6), 2082–2093. <https://doi.org/10.1016/j.aap.2010.06.021>
26. Wood, S., Michaelides, G., & Thomson, C. (2021). Human resource management practices and organizational injury rates. *Journal of Safety Research*, 78, 69–79. <https://doi.org/10.1016/j.jsr.2021.06.003>
27. Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and applied implications. *Journal of Applied Psychology*, 65(1), 96–102. <https://doi.org/10.1037/0021-9010.65.1.96>
28. Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology*, 85(4), 587–596. <https://doi.org/10.1037/0021-9010.85.4.587>
29. Zohar, D. (2008). Safety climate and beyond: A multilevel multiclimatic framework. *Safety Science*, 46(3), 376–387. <https://doi.org/10.1016/j.ssci.2007.03.006>
30. Zohar, D., & Luria, G. (2005). A multilevel model of safety climate: Cross-level relationships between organization and group-level climates. *Journal of Applied Psychology*, 90(4), 616–628. <https://doi.org/10.1037/0021-9010.90.4.616>