International Models of Occupational Health and Safety:

Strategies, Systems, and Success Stories

Kaan Koçali
Istanbul Gelisim University, Turkey

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Preface

Occupational health and safety (OHS) has evolved from being a narrowly defined set of workplace regulations to a broad, multidimensional discipline encompassing public health, human resources, risk management, and sustainable development. In the context of globalization, industrial transformation, and technological acceleration, OHS has become a central element of modern organizational strategy and national development agendas. The COVID-19 pandemic, climate-related disasters, and the growing prevalence of remote and digital work environments have further demonstrated that the well-being of workers is inseparable from the resilience of economies and societies. This book, International Models of Occupational Health and Safety: Strategies, Systems, and Success Stories, provides a comprehensive and comparative perspective on how OHS systems are designed, implemented, and improved across diverse geographical, cultural, and industrial settings.

THE GLOBAL CONTEXT OF OCCUPATIONAL HEALTH AND SAFETY

In recent decades, global initiatives—such as the International Labour Organization's (ILO) conventions, the World Health Organization's Healthy Workplace Framework, and the United Nations Sustainable Development Goals (SDGs)—have collectively redefined the principles and priorities of occupational health and safety. These frameworks emphasize not only the prevention of occupational accidents and diseases but also the promotion of a holistic safety culture that integrates physical, psychological, and social well-being. Yet, the implementation of these principles varies widely among countries and sectors, reflecting differences in economic development, institutional capacity, governance models, and cultural attitudes toward risk and responsibility.

This diversity underscores the need for a global comparative approach. By examining successful OHS models and strategies from multiple continents, this

book aims to identify both common principles and contextual variations that can inform future policy and practice. The chapters collectively demonstrate that there is no single "best" system; rather, there are adaptable frameworks shaped by local realities, stakeholder engagement, and continuous learning.

RELEVANCE AND POSITION IN THE CONTEMPORARY WORLD

Today's world of work is characterized by complexity and interdependence. Global supply chains, transnational corporations, and remote digital work have blurred the boundaries of traditional workplace environments. Consequently, occupational risks are no longer confined to factories or construction sites—they extend into offices, homes, and digital platforms. At the same time, emerging technologies such as artificial intelligence, robotics, and wearable sensors are transforming the way safety is monitored and managed. This transformation presents both opportunities and challenges: while automation and data analytics can enhance hazard detection and decision-making, they also raise ethical, psychological, and skill-related concerns.

Within this dynamic context, the study of international OHS models becomes crucial. Understanding how countries integrate legal frameworks, institutional coordination, training systems, and cultural values into safety management can provide valuable lessons for global adaptation and resilience. This book positions itself as a bridge between academic research, policy formulation, and practical application in the field of occupational health and safety.

TARGET AUDIENCE

This book is intended for a wide range of audiences. It will be particularly valuable to:

- Academicians and researchers in the fields of occupational health, industrial engineering, human resource management, and public policy who seek to explore comparative and interdisciplinary perspectives.
- Practitioners and safety professionals aiming to benchmark and enhance their organizational safety systems based on international best practices.
- Policy makers and regulators involved in developing or revising national occupational safety frameworks.
- Students and early-career professionals who wish to gain a holistic understanding of how OHS systems function at both organizational and systemic levels across different countries.

- The book balances theoretical foundations with practical insights, making it both a scholarly reference and a field guide for real-world application.

OVERVIEW OF THE CHAPTERS

This book offers a comprehensive and integrative examination of occupational health and safety (OHS) from a global, comparative, and innovation-driven perspective. Designed to serve scholars, policymakers, practitioners, and graduate students, the volume brings together normative frameworks, international governance systems, technical risk management tools, emerging global challenges, and digital transformation dynamics shaping the future of worker safety. The chapters are structured in a progressive manner, beginning with foundational principles and advancing toward cutting-edge technological and psychosocial considerations.

The volume opens with a normative and rights-based perspective in "The Safe and Healthy Working Environment" as a Fundamental Principle and Right: An Assessment in the Context of the ILO and UN 2030 SDGs." This chapter positions occupational health and safety within the broader framework of international labor standards and sustainable development. By examining the evolution of the recognition of a safe and healthy working environment as a fundamental principle and right at work, the chapter establishes the ethical and legal foundation upon which contemporary OHS systems are constructed. It further links worker safety to the United Nations Sustainable Development Goals, particularly those related to decent work, inequality reduction, and sustainable economic growth.

Building upon this conceptual foundation, International Models and Success Stories in Occupational Health and Safety: Global Strategies and Systems for Worker Safety provides a global overview of institutional models and governance mechanisms that have successfully enhanced occupational safety outcomes. Through comparative analysis, the chapter identifies structural components—such as regulatory enforcement capacity, tripartite collaboration, safety culture integration, and data transparency—that characterize high-performing systems.

A detailed comparative policy analysis is presented in Occupational Health and Safety Strategies of European Union, United States, Japan, Australia–New Zealand, Canada, Nordic Countries, and Singapore. By examining diverse regulatory traditions and enforcement models, this chapter provides insights into how national context, legal culture, and economic structure influence safety performance. Complementing this macro-level analysis, Learning from Success: International Best Practices in Reducing Occupational Accidents and Diseases synthesizes evidence-based prevention strategies that have demonstrably reduced accident rates and occupational illnesses across sectors.

The book then shifts to core management systems and operational tools. Risk Assessment and Hazard Prevention Techniques Across Industries offers a structured overview of hazard identification methodologies, risk evaluation models, and prevention strategies applicable to manufacturing, construction, logistics, healthcare, and service industries. The subsequent chapter, Leading Indicators in Occupational Health and Safety and Integration with ISO 45001, focuses on performance measurement and proactive safety management. It discusses the strategic use of leading indicators, predictive metrics, and continuous improvement frameworks aligned with ISO 45001 standards.

Emerging global risk landscapes are addressed in two dedicated chapters. Navigating the Intersection of Climate Change and Occupational Health and Safety analyzes climate-related occupational risks, including heat stress, extreme weather exposure, environmental hazards, and green transition challenges. Learning from COVID-19: Building a Robust Pandemic Preparedness Management System draws lessons from the global pandemic and proposes structured preparedness models for biological risk governance, crisis coordination, and institutional resilience.

The digital transformation of work and its regulatory implications are explored in Occupational Health and Safety in the Age of Industry 4.0: Legal and Regulatory Responses to Digital Risk Environments. This chapter examines cyber-physical systems, automation, platform-based employment, and algorithmic management, highlighting emerging legal and compliance challenges in digitalized work environments.

Artificial intelligence and advanced analytics form a dedicated thematic cluster within the volume. The Role of AI and Machine Learning in Predictive Safety Analytics discusses predictive modeling, real-time monitoring systems, and data-driven risk detection mechanisms that enable proactive intervention. Transforming Employee Safety Training Through Artificial Intelligence Innovations explores adaptive learning platforms, simulation technologies, and AI-enhanced behavioral safety training models. Extending digital transformation into sector-specific application, Digital Transformation and Healthcare Safety: Role of Technology, Communication, and Work Environment in Patient Outcomes analyzes the integration of digital tools within healthcare systems and their impact on patient and worker safety outcomes.

The final section of the book emphasizes sectoral applications and human-centered dimensions of safety governance. Creating a Culture of Safety: International OHS Models in Hospitality examines safety culture frameworks within service-intensive industries, highlighting leadership, employee engagement, and behavioral safety practices. Psychosocial Risk Management among First Responders: A Comparative Analysis of Burnout Prevention Strategies in Canada and the United States focuses on mental health resilience, burnout prevention, and psychosocial risk mitigation in high-stress occupations. Concluding the thematic exploration, Nonverbal Incivility in

the Workplace: Rethinking Organizational Politics investigates subtle interpersonal dynamics, micro-behaviors, and organizational culture factors that may indirectly influence occupational risk and employee well-being.

Collectively, the chapters in this volume present a multidimensional and forward-looking perspective on occupational health and safety. By integrating rights-based foundations, comparative governance models, technical risk management systems, emerging global challenges, digital transformation, artificial intelligence applications, and psychosocial considerations, the book provides a comprehensive framework for understanding and advancing OHS systems in a rapidly evolving world of work. The volume contributes to academic scholarship by bridging policy analysis, management science, technology studies, and organizational behavior, while also offering practical insights for institutional leaders and safety professionals seeking resilient and sustainable safety strategies.

SIGNIFICANCE AND CONTRIBUTION OF THE BOOK

This book contributes to the global discourse on occupational health and safety by providing a comparative, evidence-based analysis of models and practices. Its interdisciplinary approach bridges the gap between policy, research, and implementation, offering a roadmap for building resilient and sustainable safety systems. The diverse contributions emphasize the shared responsibility of employers, employees, governments, and society in promoting a culture of prevention and care. Furthermore, by documenting success stories, the book not only highlights achievements but also provides replicable insights for continuous improvement. It invites readers to reflect on how safety can be reimagined as an investment in human capital, organizational productivity, and social well-being.

CONCLUSION

In an era marked by rapid change, uncertainty, and global interconnectivity, occupational health and safety remains a cornerstone of sustainable development. The models and experiences presented in this volume remind us that safety is not a static goal but a dynamic process rooted in learning, adaptation, and cooperation. As editor, I hope this book will inspire researchers, practitioners, and policymakers to pursue innovative strategies that safeguard not only workers but also the societies they help build. The lessons shared across nations demonstrate that advancing occupational health and safety is ultimately an investment in humanity's collective progress.

Chapter 1
"The Safe and Healthy Working Environment" as a Fundamental Principle and Right:
An Assessment in the Context of the ILO and UN 2030 SDGs

Ayşenur Öktem Özgür
http://orcid.org/0000-0002-9011-9704
Karamanoglu Mehmetbey University, Turkey

ABSTRACT

This chapter explores the approach of the International Labour Organization (ILO) to occupational health and safety (OHS) from a historical perspective. It begins by examining the ILO's founding vision in 1919, the role of OHS within its overall mission, the development of international conventions and standards over time, and the significance of Conventions No. 155 and 187. Subsequently, the impacts of the ILO's 2022 recognition of a safe and healthy working environment as the fifth fundamental principle and right at work will be examined, along with debates concerning its binding nature for countries that have not ratified the relevant conventions Following this, the focus shifts to the ILO's new OHS strategy introduced in 2023, highlighting its key components and preventive approach. Finally, the intersection of OHS with the 2030 Sustainable Development Goals (SDGs) is addressed, with particular attention to issues such as health, gender equality, decent work, and poverty reduction.

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INTRODUCTION

In addition to biological and physiological variables, human health is influenced by social, environmental, behavioral, and political elements that are influenced by the environments in which people live, work, and maintain social relationships. To effectively address health issues, this multifaceted interplay calls for comprehensive, multi-sectoral, and institutionally robust policy measures. Occupational safety and health (OSH) policies, in particular, aim to improve the overall health and well-being of both workers and the wider community (WHO and CSDH, 2008; ILO, 2023a).

The pace of change in working life is accelerating, driven by demographic shifts, economic transformations, technological advances, and global crises (World Bank, 2019; UNDP, 2021). In this rapidly evolving landscape, safeguarding and promoting decent work for all has become a key priority for everyone involved in OSH.

Since its establishment in 1919, the International Labour Organization (ILO) has prioritized protecting workers from workplace accidents and occupational illnesses. To support this goal, it has developed international standards and conventions (ILO, 2021a). In 2022, the ILO formally recognized a safe and healthy working environment (SHWE) as a fundamental human right. This milestone has broadened the scope of OSH, moving it beyond purely technical considerations to encompass human rights, social justice, and sustainable development. As a result, the ILO's global OSH strategy adopted in 2023 seeks to reduce workplace accidents and illnesses, improve the quality of work life, promote business sustainability, and lessen the socio-economic burden, especially in low-income regions (ILO, 2023b).

This is an important milestone in the construction of a sustainable, inclusive, and fair working life. Moreover, this approach directly or indirectly overlaps with the United Nations' 2030 Sustainable Development Goals (SDGs) and contributes to the strengthening of policies to improve the quality of working life on a global scale (SDG & BOHS, 2022). In this framework, OSH stands out as a fundamental policy area that both increases the welfare of workers and contributes to the creation of a sustainable, inclusive, and equitable working life.

From this perspective, the chapter initially examines the original vision of the ILO established in 1919, the role of OSH within the organization's broader mission, the international conventions and standards that have evolved over the years, and the significance of Conventions No. 155 and 187. It then evaluates the consequences of recognizing a SHWE as the fifth fundamental principle and right by the ILO in 2022, and analyzes the binding implications of this decision for countries that have yet to ratify the pertinent conventions. Next, the newly introduced global OSH strategy for 2023 is explored, with an emphasis on its key elements and preventive measures. Lastly, the connection between OSH and the 2030 SDGs is examined, particularly focusing on its relevance to no poverty (SDG 1), health and well-being

Chapter 2
International Models and Success Stories in Occupational Health and Safety:
Global Strategies and Systems for Worker Safety

Krishna Kumar Ravichandran
http://orcid.org/0000-0002-7948-0291
KPR Institute of Engineering and Technology, India

ABSTRACT

This chapter examines international models of Occupational Health and Safety (OHS) with an emphasis on its critical role in enhancing socio-economic welfare through industry safety, ethical practices, employee trust, productivity, and national economic growth. It covers sectors including high-risk industries like construction, where construction safety remains a challenge, as well as expanding fields such as IT, healthcare, and education. The chapter synthesizes research on occupational stress and its impact on workplace safety, integrating findings on green building hazards with ergonomic strategies. It highlights the importance of safety management systems and worker engagement in reducing accidents. The use of predictive analytics, including advanced machine learning, is discussed as a powerful tool for hazard detection and risk mitigation, supporting adaptive OHS systems for sustainable workplace health improvement

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1. INTRODUCTION

Occupational Health and Safety (OHS) has emerged as one of the most critical pillars of modern industrial development, economic sustainability, and workforce welfare across the world (International Labour Organization [ILO], 2023. As nations continue to evolve technologically, demographically, and economically, the protection of workers from injuries, illnesses, and psychosocial risks has transformed from a regulatory obligation into a strategic imperative. Today, OHS frameworks not only safeguard physical well-being but also enhance productivity, strengthen organizational culture, support innovation, and contribute to long-term national competitiveness.

The concept of OHS has changed dramatically over the past century. Earlier models were predominantly reactive, primarily focusing on accident reporting, compensation, and basic hazard control measures. Over time, growing awareness, industrial expansion, and the psychological and social complexities of work environments (Leka & Jain, 2019) pushed OHS toward more advanced preventive and systemic models.(Quinlan, 2015) Modern OHS systems emphasize proactive risk identification, integrated health promotion, and continuous improvement supported by scientific research, standards, and evidence-based practices.

This chapter explores the evolution of international OHS models, compares different national approaches, and presents successful case examples that illustrate how organizations worldwide have achieved remarkable outcomes through robust safety strategies. It draws attention to human factors, technological innovations, and socio-cultural influences that shape workplace safety in diverse environments. It also highlights the global movement toward harmonized standards, digital transformation, and policy-driven reforms that aim to create safer and healthier workplaces for all.

1.1. The Global Emergence of OHS as a Strategic Priority

The global emphasis on OHS is rooted in both economic and ethical dimensions. Organizations increasingly recognize that workplace injuries and illnesses impose significant direct and indirect costs, including medical expenses, productivity loss, legal liabilities, reduced morale, and reputational damage. At the macro level, governments realize that national productivity and human capital development are closely tied to workplace safety.

A significant milestone in the global recognition of OHS came with the formation of international bodies such as the International Labour Organization (ILO), which established conventions and recommendations that guide national legislative frameworks. The World Health Organization (WHO) further expanded the scope by linking workplace health to broader public health concerns.(World Health Organization

Chapter 3
Occupational Health and Safety Strategies of the European Union, United States, Japan, Australia–New Zealand, Canada, Nordic Countries, and Singapore

S. Hemalatha
http://orcid.org/0009-0005-0397-8738
Panimalar Engineering College, India

Karedla Nandhini
Nalla Narasimha Reddy Group of Institutions Integrated Campus, India

Lakshmi Banavath
Nalla Narasimha Reddy Group of Institutions Integrated Campus, India

D. Naga Malleswari
Koneru Lakshmaiah Education Foundation, India

Jyoti D. Shendage
Sri Balaji University, India

S. Krithick Ajay
Panimalar Engineering College, India

ABSTRACT

Occupational Health and Safety (OHS) systems across the world have evolved in diverse ways, shaped by historical, socio-economic, regulatory, and cultural contexts. Understanding these models is essential for policymakers, industries, and global organizations seeking to benchmark practices, improve workplace safety, and foster

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sustainable work environments. This chapter presents a comparative overview of major international OHS models—European Union, United States, Japan, Australia–New Zealand, Canada, Nordic countries, and Singapore. For each model, the chapter outlines key strategies, regulatory systems, structural features, and notable success stories. The analysis concludes by highlighting global best practices and strategic insights that can guide countries and organizations in enhancing workforce safety, resilience, and well-being.

1. INTRODUCTION

Occupational Health and Safety (OHS) (Kajiki et al., 2020) has evolved into one of the most critical pillars of modern industrial societies. Regardless of a nation's economic standing or regulatory philosophy, ensuring safe and healthy workplaces has become an essential requirement for economic growth, social justice, workforce well-being, and organizational sustainability. At its core, OHS encompasses the systems, institutions, regulations, cultural practices, and scientific principles designed to protect workers from injury, illness, and fatality. Yet, while the objectives of OHS are universal, the pathways chosen by countries vary dramatically based on history, culture, industry structure, and levels of development.

The past century has witnessed profound transformations in global labor markets (Zanko & Dawson, 2012). The transition from agrarian to industrial economies, the rise of manufacturing, the growth of extractive industries, mass urbanization, and the digital revolution have all brought new categories of workplace hazards. Early OHS efforts in most countries were crisis-driven, emerging as reactions to disasters, mass injuries, or public outcry. Over time, the focus shifted toward systematic prevention, enforcement-based regulation, and public health approaches. In the 21st century, the emphasis is increasingly on risk management, data-driven monitoring, psychosocial health, and the integration of technology for predictive safety.

Studying international models is essential for several reasons. First, no single country has perfected OHS; each model embodies strengths and limitations shaped by social values and regulatory contexts. Second, globalized supply chains mean that workplace risks transcend national boundaries—unsafe labor practices in one region can disrupt production elsewhere or create reputational and legal risks for multinational corporations. Third, emerging hazards such as climate-related risks, automation, artificial intelligence, digital fatigue, and global pandemics demand collaborative learning from diverse OHS cultures. Finally, international benchmarking allows governments and organizations to adopt best practices suited to their unique contexts.

Chapter 4
Learning From Success:
International Best Practices in Reducing Occupational Accidents and Diseases

Kaan Koçali
http://orcid.org/0000-0002-1329-6176
Istanbul Gelisim University, Turkey

ABSTRACT

This chapter contributes to the book by providing a structured, comparative analysis of successful international occupational health and safety models, moving beyond regulatory descriptions to focus on why and how certain systems effectively reduce occupational accidents and diseases. Unlike chapters that concentrate on single-country cases or specific regulations, this contribution synthesizes diverse regional experiences—developed and developing alike—to extract transferable success factors and policy-relevant lessons. The chapter aligns closely with the book's core themes of strategies, systems, and success stories, offering both analytical depth and practical implications. Its emphasis on prevention, learning from success, and adaptability ensures relevance for academics, policymakers, and practitioners seeking evidence-based pathways to improve OHS performance across different institutional and socio-economic contexts.

1. INTRODUCTION

Workplace accidents and occupational diseases continue to be one of the most significant occupational health and safety issues on a global scale today. According to international estimates, millions of workers are injured in workplace accidents

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each year, while hundreds of thousands lose their lives due to occupational diseases or causes related to workplace accidents. This situation is not limited to individual health losses; it also has multidimensional consequences such as loss of productivity, increased social security expenditures, and weakened economic sustainability. The fact that occupational diseases are largely unreported shows that the real scale of the problem goes beyond official statistics (International Labour Organization [ILO], 2019; Takala et al., 2014).

Traditional occupational health and safety approaches have been shaped primarily within a reactive framework for many years, focusing on investigating causes and compensating for consequences after accidents have occurred. However, the limited effectiveness of this approach has become apparent, particularly in high-risk sectors where accidents and occupational diseases persist. This situation has accelerated the shift towards preventive, systematic, and learning organization-based models in occupational health and safety management. This new approach, which emphasizes elements such as risk-based management, worker participation, leadership, and continuous improvement, treats accidents not as "inevitable" outcomes but as preventable events (Reason, 2000; Robson et al., 2007).

In this transformation process, not only the existence of regulatory legislation but also the question of how these regulations are implemented and under what conditions they achieve success has become critically important. In this context, the experiences of countries and sectors that have achieved meaningful and sustainable reductions in occupational accidents and diseases provide an important source of learning on a global scale. The "learning from success stories" approach aims to go beyond abstract policy goals in the field of occupational health and safety and reveal the mechanisms through which concrete practices produce effective results. This approach requires not only identifying good practices but also analyzing why they work (EU-OSHA, 2019; Walters et al., 2016).

This section aims to examine occupational health and safety practices that have been successful in reducing work accidents and occupational diseases in different countries and contexts, identifying their common features and distinguishing characteristics. The section's original contribution is that it does not merely describe successful examples; it evaluates the institutional structure, management approach, risk management approach, and safety culture components behind these successes within a holistic framework. Thus, it aims to provide transferable policy and practice lessons for countries with different socio-economic and institutional structures. The fundamental assumption is clear: Accidents are not inevitable; they can be largely prevented through the right systems, effective practices, and learning organizations (Hämäläinen, Takala, & Saarela, 2017; Rasmussen, 1997).

Chapter 5
Risk Assessment and Hazard Prevention Techniques Across Industries

Shubhashree Sahoo
http://orcid.org/0000-0002-7859-2638
Sphoorthy Engineering College, India

T. C. Manjunath
http://orcid.org/0000-0003-2545-9160
Rajarajeswari College of Engineering, Bengaluru, India

P. Selvakumar
http://orcid.org/0000-0002-3650-4548
Department of Science and Humanities, Nehru Institute of Technology, Coimbatore, India

Subramaniam Seshan Iyer
http://orcid.org/0000-0002-3843-9399
Datta Meghe Institute of Management Studies, India

R. Shobarani
http://orcid.org/0000-0003-0183-3867
Dr. M.G.R. Educational and Research Institute, India

Rishabh Patel
Datta Meghe Institute of Management Studies, India

ABSTRACT

Risk assessment is a cornerstone of public health, clinical medicine, and pharmaceutical development, serving as a structured approach for identifying, evaluating, and managing the potential hazards associated with drugs, chemicals, or environmental exposures. In the context of drug safety and efficacy, risk assessment enables stakeholders—regulators, healthcare providers, manufacturers, and researchers—to make informed decisions by quantifying potential harms and weighing them against anticipated therapeutic benefits. The science of risk assessment has evolved significantly, driven by advancements in toxicology, pharmacology, epidemiology, and

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computational modeling. This comprehensive exploration outlines the fundamental principles, methodologies, and practical applications of risk assessment, emphasizing its central role in safeguarding public health and promoting responsible innovation in medicine. Risk assessment refers to the systematic process of evaluating the likelihood and severity of adverse outcomes resulting from exposure to a particular agent under defined conditions.

UNDERSTANDING RISK ASSESSMENT: PRINCIPLES AND PRACTICES

Risk assessment is a cornerstone of public health, clinical medicine, and pharmaceutical development, serving as a structured approach for identifying, evaluating, and managing the potential hazards associated with drugs, chemicals, or environmental exposures. In the context of drug safety and efficacy, risk assessment enables stakeholders—regulators, healthcare providers, manufacturers, and researchers—to make informed decisions by quantifying potential harms and weighing them against anticipated therapeutic benefits. The science of risk assessment has evolved significantly, driven by advancements in toxicology, pharmacology, epidemiology, and computational modeling. This comprehensive exploration outlines the fundamental principles, methodologies, and practical applications of risk assessment, emphasizing its central role in safeguarding public health and promoting responsible innovation in medicine. Definition and Scope of Risk Assessment: Risk assessment refers to the systematic process of evaluating the likelihood and severity of adverse outcomes resulting from exposure to a particular agent under defined conditions. In the realm of pharmacology and healthcare, the term typically applies to evaluating the safety profile of drug substances, biologics, medical devices, or treatment protocols. The assessment often spans preclinical and clinical stages of development, as well as post-marketing surveillance. It encompasses a range of considerations, including toxicological effects, pharmacokinetics, pharmacodynamics, drug-drug interactions, demographic variability, and comorbidities. Risk assessments are used not only for regulatory approvals but also in guiding prescribing practices, formulating risk mitigation strategies, and informing patient education. Core Components of Risk Assessment: Risk assessment is generally structured around four interrelated components: hazard identification, dose-response assessment, exposure assessment, and risk characterization.

This involves determining whether a substance or intervention is inherently capable of causing adverse effects. This is typically based on data from animal studies, in vitro assays, human case reports, and mechanistic research. Dose-Response Assessment: This step quantifies the relationship between the magnitude of exposure and

Chapter 6
Leading Indicators in Occupational Health and Safety and Integration With ISO 45001

Rabia Balcı
http://orcid.org/0000-0002-5959-1955
Occupational Health and Safety Program, Amasya University, Turkey

ABSTRACT

Leading indicators in occupational health and safety (OHS) are proactive measures that provide early warning of potential incidents, complementing traditional lagging indicators such as injury rates. This chapter explains the concept of leading indicators and their importance in fostering a prevention-focused safety culture. It discusses how leading indicators can be developed and integrated into an organization's OHS management system, particularly in alignment with the ISO 45001:2018 standard for OHS management. Through a review of recent literature and case examples, the chapter highlights key categories of leading indicators, benefits of their use, and common challenges in implementation. It also illustrates how integrating these forward-looking metrics within the ISO 45001 framework can drive continuous improvement in safety performance and help organizations in their journey toward 'zero harm'.

1. INTRODUCTION

Occupational health and safety (OHS) is one of the determinants of sustainable industrial performance and human well-being. Despite the existence of substantial

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regulatory and institutional safeguards established over the past decades to improve OHS outcomes, empirical evidence indicates that occupational risks remain widespread. For instance, according to the International Labour Organization (2023), more than 340 million occupational accidents and 160 million work-related diseases occur annually worldwide, resulting in approximately 2.8 million fatalities. These translate into an economic burden exceeding 4% of global GDP. Within the European Union, the limited long-term reduction in fatal occupational injury rates has led scholars and policy institutions to question the effectiveness of predominantly compliance-based and reactive safety management approaches, particularly those relying heavily on lagging indicators (Zwetsloot et al., 2013; Pawłowska, 2015; European Agency for Safety and Health at Work [EU-OSHA], 2023; Golabchi et al., 2024).

Historically, the measurement of OHS performance has relied primarily on lagging indicators-frequency rates, lost-time injuries, and compensation costs-that quantify past failures (Manuele, 2009; Walaski, 2020). Although valuable for benchmarking, these retrospective metrics fail to capture early warning signals of system degradation. As industries become more digitalised and interdependent, the inadequacy of lagging data in predicting incidents has become increasingly evident (Leveson, 2015; Bargar et al., 2025). In response, researchers and practitioners have called for the systematic incorporation of *leading indicators*-proactive, process-oriented measures that monitor the effectiveness of preventive actions (Sinelnikov et al., 2015; Haas et al., 2017; Neamat, 2019).

1.1 From Reactive Control to Proactive Governance

The intellectual evolution from lagging to leading indicators mirrors the broader paradigmatic shift in safety science from linear causation to systems thinking. Heinrich's classic *accident triangle* framed incidents as predictable outcomes of unsafe acts (Heinrich, 1941). However, later theories offered a different perspective on accident causations. However, later theories offered a different perspective on accident causation. James Reason's Swiss-cheese model and Sidney Dekker's drift into failure model reconceptualised accidents as emergent phenomena rather than isolated events (Reason, 2016; Dekker, 2016). In respect of these views, accidents arise from complex interactions within sociotechnical systems, where multiple latent conditions and organizational factors align over time. Leveson (2015) advanced this understanding through her *Systems-Theoretic Accident Model and Processes (STAMP)*, which positions safety as a control function dependent on feedback, communication, and constraint enforcement rather than as a reactive response to failures. This shift has important implications for safety indicator design, as it directs attention away from outcome-based, lagging indicators toward leading indicators that

Chapter 7
Navigating the Intersection of Climate Change and Occupational Health and Safety

Özlem Yurtsever
http://orcid.org/0000-0002-5312-3771
Marmara University, Turkey

ABSTRACT

This chapter asserts the climate crisis presents an urgent challenge to global OHS systems, which fail to address climate risks and structural inequities. The objective is to offer actionable strategies and identify research priorities for vulnerable populations. The chapter details how climate change harms workers through direct hazards like extreme heat and extreme weather, and indirect psychosocial stressors. Vulnerabilities are mapped across climate-sensitive sectors: agriculture, construction, and informal labor. Addressing this requires a shift toward a climate-adaptive safety paradigm, integrating ILO/WHO frameworks with ESG reporting. Effective safeguarding demands combining regulatory reform, workplace adaptation, and technological innovation, including wearable sensors and AI-driven analytics, for real-time risk assessment. Ultimately, the chapter advocates for sustained intersectoral collaboration and long-term, equity-centered strategies to ensure worker protection.

1. INTRODUCTION

The climate crisis ranks among the most urgent challenges of our century. Its impacts span public health, economic stability, and working conditions. Rising tem-

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peratures, shifting rainfall patterns, and the growing frequency of extreme weather are already altering how and where people work across many industries (ILO, 2024; Marinaccio et al., 2025). Workers in various sectors face heightened threats like extreme heat and a rise in climate-sensitive diseases. Addressing these challenges calls for timely and evidence-based action. Three areas are particularly urgent: revising occupational health and safety (OHS) frameworks to include climate-related risks, applying technological innovations to strengthen protection systems, and developing adaptive strategies that build resilience and support long-term adjustment.

Even moderate warming of 1.5°C, a threshold likely to be breached by 2030, is expected to have cascading effects that extend beyond the environment to worker health and safety. Rising sea levels, food insecurity, and pressures on public health systems amplify occupational vulnerabilities, particularly in agriculture, fisheries, and coastal industries. Developing small island states epitomizes this uncertainty. Marginalized groups, such as Sub-Saharan African agricultural workers, face compound crises where extreme heat and drought undermine both worker health and local food systems (FAO, 2019; IPCC, 2018). Yet, regional-level evidence on how climate change affects occupational health remains limited, especially concerning the differences between 1.5°C and 2°C warming across climate-sensitive outcomes and their implications for labor migration (Ebi et al., 2018).

Climate-sensitive health outcomes such as infectious diseases, deteriorating air quality, and rising mental health challenges carry direct implications for occupational health. Diarrheal diseases, for example, increase risks for workers in water-dependent industries, while heat-related stress contributes to burnout in emergency services and construction sectors. Migration triggered by climate pressures heightens worker vulnerability, as displaced laborers often fall outside formal OHS protections.

As climate risks intensify, policymaker responses are gaining momentum. This growing awareness is beginning to translate into policy action, especially as concrete data from urban and national bodies become available. Workers in climate-sensitive sectors face disproportionate risks, a point elaborated in Section 2.1. These environmental shifts intensify physical and psychosocial risks, threatening worker well-being and economic resilience across sectors. Beyond direct health effects, climate change imposes significant economic burdens through productivity losses, increased healthcare expenditures, and deepening poverty, revealing the macroeconomic imperative of investing in OHS. In the United States, public hearings were held by the Occupational Safety and Health Administration (OSHA) in July 2025 for a proposed rule to protect workers from heat-related injury in both indoor and outdoor occupational settings, an indication that heat is becoming increasingly considered an important occupational hazard (OSHA, 2025). Similarly, urban analyses, such as a 2024 New York City report, highlight how extreme temperatures and air quality degradation disproportionately affect outdoor workers, particularly vulnerable

Chapter 8
Learning From COVID-19: Building a Robust Pandemic Preparedness Management System

Rashmi Singh
http://orcid.org/0000-0002-9620-0343
Sanskriti University, India

Abhishek Singh Bhadouria
Rajiv Academy for Technology and Management, India

Mohd Zahid
Rajiv Academy for Technology and Management, India

Junaid Hassan
Sanskriti University, India

ABSTRACT

This study aims to examine the importance of a preparedness management system in organizations to ensure a safe and healthy work environment for employees working on-site, particularly during health crises such as COVID-19. The study emphasizes the need for integrating COVID-19 based health and safety policies into organizational practices. Primary data were collected from 120 employees across different organizations using a structured questionnaire and factor analysis was done using SPSS software. The findings reveal that effective preparedness planning, clear health protocols, employee awareness and management support play a significant role in enhancing workplace safety and employee confidence. The study concludes that the

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adoption of a systematic preparedness management framework and health-focused policies is essential for improving organizational resilience, safeguarding employee well-being and ensuring continuity of operations during emergency situations.

1. INTRODUCTION

The current estimated population of India is about 1.4 billion (World Population Review, 2021), and the country is facing the covid-19 epidemic from the year 2020. Covid-19's first case in India was confirmed in Kerala on 27 January 2020 (Andrews et al., 2020). Since then, breaking the chain of coronavirus has become the main concern for the government officials and other higher-level authorities of India, and following the safety, protocols have become the duty of the individuals residing in India. Even after adopting proper safety measures, a pandemic that started in 2020 has tremendously affected many, and the condition got even more terrifying in the second wave of the year 2021. According to Worldometer, the number of deaths has increased to 346,784, and the number of registered active cases increased to 28,809,339 till 6 June 2021 (Worldometer, 2021) and are still rising. Now, the question arises that what went wrong in India when the situation was handled appropriately in the first wave of covid-19? Moreover, the answer is the mismanagement and lack of proper planning to deal with the covid-19's second wave, resulting in an increased number of active cases and deaths.

Other countries are slowly reviving their economy from the losses held due to the covid-19 pandemic, and India is still finding its way and is struggling to reduce the virus spread. Covid-19 cases in India that started to show up in March 2020 continued to increase and have taken a terrible phase until December 2020. The number of reported cases has shown a little slowdown from January to March 2021, but without any appropriate preparedness management system, the cases again started to increase in April 2021(Wikipedia, 2021).

India has started its covid-19 vaccination campaign in January 2021. As of 5 June 2021, India has managed 231,322,417 doses overall (first and second dose) of the presently permitted vaccine (Wikipedia, 2021). In the first phase of covid -19, the threat of risk was more on people of age group 45 or 45+; therefore, the government of India started the vaccination process for this age group. Later, the lack of a preparedness management system leads the country into the second phase of covid -19, where the threat has shifted to the younger generation of 18+. Therefore, looking into the seriousness of the matter, the government permitted the vaccination of this age group in May 2021. Whereas India being the second-largest populated country globally, is facing a shortage of vaccination doses. Hence, if the situation continues, there will be no way out, and the third wave will continue to have a much

Chapter 9
Occupational Health and Safety in the Age of Industry 4.0:
Legal and Regulatory Responses to Digital Risk Environments

Rajiv Gurugopinath
http://orcid.org/0000-0003-3845-6778
Ramaiah College of Law, India

Ramya Krishnappa
http://orcid.org/0000-0001-8900-454X
Christ University, India

ABSTRACT

The rapid diffusion of artificial intelligence, automation, data analytics, and platform-based work has fundamentally transformed occupational risk profiles, challenging industrial-era frameworks of occupational health and safety (OHS). While traditional OHS law focused on physical and mechanical hazards, digitally mediated workplaces generate new forms of harm—psychosocial stress, cognitive overload, algorithmic bias, and privacy erosion—that remain inadequately regulated. The study highlights structural gaps, regulatory fragmentation, and emerging best practices. The chapter proposes a reform agenda emphasizing inclusive protection for gig and informal workers, algorithmic accountability, psychosocial risk recognition, and anticipatory regulation, positioning digital occupational safety as a cornerstone of equitable and sustainable future-of-work governance.

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1. INTRODUCTION

The fourth industrial revolution, now alternatively called Industry 4.0, is the massive reorganization of production processes and workplaces based on the incorporation of cyber-physical systems, artificial intelligence (AI) and automation, the Internet of Things (IoT) and analytics that are based on data. These technologies have changed the nature, organizational form and even content of work itself in addition to industrial efficiency. Occupational health and safety (OHS) that has always been reserved to bodily threats like mechanical injury, exposure to chemicals and ergonomic dangers is challenges in this changing environment more than ever before (Obasi & Benson, 2025). The digitalized workplaces are further subjecting human Labour to work out of direct physical interactions to monitoring, inter, and decision-making in the framework of systems controlled by algorithms, thus allowing the definition of the occupational risk to extend beyond the physical harm to cognitive, psychological, and informational vulnerability. This change requires that OHS be reinterpreted as a holistic concept that can counteract the real and imaginary harms in work-related digital environments (Moraru, 2024) and argues that such risks require a jurisprudential and regulatory reimagining of OHS grounded in dignity, autonomy, and constitutional labour protections rather than narrow compliance-oriented safety norms.

The appearance of automation and AI-controlled working forces has added another set of so-called techno-psychosocial risks within the scope of which the current regulatory framework is poorly equipped. The algorithmic management systems have taken over the task allocation and work intensity, performance appraisals and payment in the sectors of manufacturing and logistics to platform-level and gig work. At the same time, wearable devices, biometric gadgets and productivity trackers allow tracking the actions, motions, and physiological parameters of employees at all times. Even though the existence of such systems is frequently explained by the need to enhance efficiency, precision, and predictive safety, these systems erase the borders between supervision and surveillance, diminish worker autonomy, and established power and accountability imbalance (Sebastian et al., 2025). These digital practices are an empirical study that is gradually adding stress, anxiety, burnout, and job insecurity to the list of consequences, especially those related to service-based and remote work-based economies, like the Indian IT-enabled sectors. The shift of the focus of the mechanical hazards to the cognitive and emotional strain posed by digital technology, therefore, is a paradigmatic one in the nature of the occupational hazard, where the concern with algorithmic strain, digital fatigue, and harm related to surveillance should be viewed as a legitimate one, in terms of OHS (Rahmi et al., 2025).

Chapter 10
The Role of AI and Machine Learning in Predictive Safety Analytics

P. Selvakumar
http://orcid.org/0000-0002-3650-4548
Department of Science and Humanities, Nehru Institute of Technology, Coimbatore, India

V. M. R. Hiremath
Rao Bahadur Y. Mahabaleswarappa Engineering College, India

R. Kalai Selvi
Kuppam Engineering College, India

Undabatla Rambabu
http://orcid.org/0000-0003-2731-1610
Lakireddy Bali Reddy College of Engineering, India

Vijay Uprikar
http://orcid.org/0000-0003-2546-8307
Datta Meghe Institute of Management Studies, India

Ninad Rithe
http://orcid.org/0009-0004-5729-6081
Datta Meghe Institute of Management Studies, India

ABSTRACT

Predictive safety analytics in healthcare represents a transformative approach to managing patient care, clinical risks, and operational efficiency by using data-driven insights to anticipate safety issues before they arise. Unlike traditional reactive methods, which respond to adverse events after they occur, predictive analytics proactively identifies patterns and risk factors that signal the potential for harm. By leveraging predictive safety analytics enables healthcare systems to forecast patient deterioration, reduce medical errors, prevent hospital-acquired conditions, and optimize resource allocation—ultimately fostering a safer, more efficient health-

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care environment. Predictive safety analytics refers to real-time data anticipate in healthcare settings. Encompasses the collection, structured, and ranging electronic health (EHRs), laboratory test results, and vital signs to clinician notes, wearable device data, and even social determinants of health. Patients are categorized based on their risk levels, allowing clinicians to prioritize interventions.

UNDERSTANDING PREDICTIVE SAFETY ANALYTICS IN HEALTHCARE

Predictive safety analytics in healthcare represents a transformative approach to managing patient care, clinical risks, and operational efficiency by using data-driven insights to anticipate safety issues before they arise. Unlike traditional reactive methods, which respond to adverse events after they occur, predictive analytics proactively identifies patterns and risk factors that signal the potential for harm. By leveraging predictive safety analytics enables healthcare systems to forecast patient deterioration, reduce medical errors, prevent hospital-acquired conditions, and optimize resource allocation—ultimately fostering a safer, more efficient healthcare environment. Predictive safety analytics refers to real-time data anticipate in healthcare settings. Encompasses the collection, structured, and ranging electronic health (EHRs), laboratory test results, and vital signs to clinician notes, wearable device data, and even social determinants of health. Patients are categorized based on their risk levels, allowing clinicians to prioritize interventions. Clinical Decision Support (CDS): Predictive insights are embedded into the clinician workflow, offering timely alerts and recommendations at the point of care. Feedback Loops: Systems continuously learn from new data and clinician input, improving predictive accuracy over time. Operational and System-Level Benefits Beyond individual patient care, predictive safety analytics improves the overall safety and efficiency of healthcare systems. It enables: Resource Optimization: Hospitals can forecast demand for ICU beds, staffing needs, or equipment usage, improving readiness and reducing bottlenecks.

Technological Enablers: The rise of predictive analytics in healthcare has been enabled by several technological advancements. The digitization provides a rich data source for analytics. Cloud Computing: Enables large-scale data storage and real-time analysis without the need for extensive local infrastructure. Allows for useful data sources like discharge summaries. Interoperability Standards: Frameworks like Wearable IoT Devices: Continuous data from smartwatches, monitors, and biosensors feeds predictive models with real-time insights into patient status. Understanding predictive safety analytics is essential for navigating the future of healthcare. As the industry shifts toward value-based, patient-centered care, the ability to prevent harm rather than respond to it becomes a critical differentiator in delivering quality

Chapter 11
Transforming Employee Safety Training Through Artificial Intelligence Innovations

Priya Harit
http://orcid.org/0009-0009-6223-3129
Lovely Professional University, India

Amrik Singh
http://orcid.org/0000-0003-3598-8787
Lovely Professional University, India

Kritika Agrawal
http://orcid.org/0009-0007-6600-8952
Institute of Hotel Management, Chennai, India

Gaurav Bathla
http://orcid.org/0000-0002-6992-811X
School of Hotel Management, Airlines, and Tourism, CT University, Ludhiana, India

Charu Dutt Sharma
Institute of Hotel Management, Ahmedabad, India

Varinder Singh Rana
City University, Ajman, UAE

ABSTRACT

Organizational success relies on workplace safety, yet complex modern environments often make traditional training insufficient. AI offers a transformative solution by combining real-time monitoring, immersive simulations, adaptive learning, and predictive analytics to enhance safety training. It reduces human error, strengthens resilience, improves risk prediction, and ensures regulatory compliance. Applications such as automated inspections, behavioural monitoring, VR simulations, and predictive maintenance lower accidents while fostering a proactive safety culture. Gamified learning, wearables, and IoT devices further personalize training and boost engagement. Despite challenges like bias, privacy, and high costs, proper strategies

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and human oversight enable ethical, scalable adoption. With AI, organizations gain a cost-effective, future-ready system that protects workers, improves compliance, and drives sustainable excellence.

INTRODUCTION

Workplace safety is a basic concern for businesses across the globe, not only based on moral obligation but also as a key determinant of operational success. Accidents and injuries disrupt workflows, decrease productivity, and harm reputations, so taking proactive measures to protect employees and ensure smooth operations is essential (Bernal et al., 2024). Historically, the traditional approach to training employees has always been one of the effective means to minimize hazards in a workplace environment and develop a culture of safety (Ljubic et al., 2016). As such, the organization would reduce the accident rates, enhance its adherence to the regulatory aspects, and create an enhanced overall environment of the workplace (Benson et al., 2024). However, the complexity of modern workplaces and the integration of new technologies require more advanced and sophisticated safety solutions (Haleem et al., 2025).

Artificial intelligence (AI), a ground-breaking tool that is altering how a company tackles safety training or education, is the breakthrough. (Rashid & Karim Kausik, 2024). AI-driven training in safety goes beyond tradition, using data-driven information and advanced technologies to create personal efficiency and engagement in learning opportunities (Park & Kang, 2024). AI-powered immersive simulations, adaptive learning systems, and predictive analytics may all help precisely detect danger, lower the possibility of human error, and guarantee adherence to changing safety rules. (Joni & Graepel, 2024). Understanding workplace risks, however, remains at the heart of effective safety training, as every industry and environment presents unique challenges (Bęś & Strzałkowski, 2024). From physical hazards such as machinery operations in an industrial environment to ergonomic concerns in an office or chemical risks in a lab, the training must be specific (Occupational Safety and Health Administration, n.d.).

AI technologies have been shown to shine at assessing these risks through analysis of historical data, real-time conditions, and generating predictive insights. This helps organizations be proactive about the risks and design training programs to prepare employees for specific scenarios, hence bettering their readiness and confidence (Chen & Dai, 2024). AI is also very helpful in addressing human mistake, which is frequently the primary cause of accidents at work. Despite their advantages, traditional training techniques can fall short in connecting with staff members or providing them with the necessary skills for high-stakes scenarios. (Shah & Mish-

Chapter 12
Digital Transformation and Healthcare Safety: Role of Technology, Communication, and Work Environment in Patient Outcomes

Vijayasree Srinivasan
http://orcid.org/0009-0006-5618-7080
Saveetha School of Management, Saveetha Institute of Medical and Technical Sciences, India

K. C. Raja Shree
http://orcid.org/0009-0009-1029-910X
Saveetha School of Management, Saveetha Institute of Medical and Technical Sciences, India

P. Praveen Kumar
http://orcid.org/0000-0002-0707-039X
SRM Institute of Science and Technology, Vadapalani, India

ABSTRACT

Digitization in healthcare is bringing new ways to improve safeguarding patients and results through the utilization of advancements like AI, EHRs, CDSS, and IoMT. However, digital evolution requires more than just technology; its impact improves when it coincides with interaction, a collaborative atmosphere, and favorable work settings; managerial variables like management, recruiting, and emotional security determine how squads use electronic devices; patient focused breakthroughs like telecommuting and smartphone applications require equitable entry and digital proficiency to function; seamless integration, processes asymmetry, and absence of

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training continue; and interactive realization and ongoing monitoring are all necessary. This chapter demonstrates how a sociotechnical paradigm that integrates digital technology along with managerial and personal elements results in safer, more long-lasting care.

INTRODUCTION

Patient security is a major global community health concern since adversarial events within healthcare systems significantly contribute to the prevention of illness, death, and rising medical expenses. According to estimates from the World Health Organization (WHO), until 80% of nursing home-related harms are preventable, around one in four individuals in productive countries experience harm during clinic care. (WHO, 2019). Unsafe care is responsible for an estimated 2.6 heap fatalities and 134 heap antagonistic incidents every year in low- and middle-income countries (WHO, 2021). Medication errors are estimated to cost the world economy more than USD 42 billion annually (OECD, 2017). Progress has been uneven and incomplete despite ongoing attention to patient security due to ground breaking findings such as To Err Is Human (Institute of Medicine, 2000) and subsequent strategies and quality pushes (Francis et al., 2025).

Simultaneously, photoelectric fitness records, automation, machine intelligence, and smart dispassionate sciences are becoming increasingly popular, and healthcare practices are rapidly becoming digitized. Patient safety issues persist despite these technologies' promises of efficacy and correct decline due to ambiguous sociotechnical, ethical, and administrative factors that fundamentally influence the development, application, and execution of sciences. This article examines patient security in the perspective of human engineering and mathematical shift in order to remedy this issue. After reviewing important ideas in patient security and mathematical strength, it surveys the consequences of sociotechnical and human engineering on safety. Finally, it proposes an integrated abstract model to direct more trustworthy algebraic transformation in healthcare.

DIGITAL REVOLUTION IN HEALTHCARE

According to Agarwal et al. (2010), mathematical change in healthcare refers to the widespread acceptance and unification of mechanics advancements to enhance dispassionate accountability, improve operational adeptness, and provide appropriate care. Photoelectric health records (EHRs), telehealth, automatic medical procedures, big dossier science of logical analysis, Internet of Things (IoT) technologies, ma-

Chapter 13
Creating a Culture of Safety: International OHS Models in Hospitality

Amrik Singh
http://orcid.org/0000-0003-3598-8787
Lovely Professional University, India

ABSTRACT

The critical role of a strong safety culture in the hospitality industry, a sector characterized by unique OHS challenges. It analyzes diverse international OHS models to identify successful strategies for risk management, employee engagement, and accident prevention. The transition from traditional, compliance-based safety programs to proactive, culture-driven approaches that empower employees at all levels. Through a synthesis of case studies and best practices from leading hospitality organizations worldwide, the chapter will provide a comprehensive framework for fostering a robust safety culture. Key themes include the implementation of effective training programs, the promotion of open communication, the strategic use of technology, and the integration of OHS principles into a company's core values. The ultimate goal is to demonstrate how a strong safety culture not only protects employees and guests but also enhances operational efficiency and strengthens a brand's reputation.

INTRODUCTION

The hospitality industry is one of the pillars of the world economy as it offers millions of jobs and experiences. However, it is also associated with its own occu-

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pational risks including slips and falls in kitchens and ergonomic pressure due to the housekeeping work and the risks of being attacked by guests. Instead of being merely a legal obligation, good culture of safety is an ethical necessity and a business need. It extends further than compliance, making safety part of the values of an organization, its decision making and day-to day activities. The global paradigms of Occupational Health and Safety (OHS) offer excellent paradigms to ensuring the health, safety and welfare of employees in all industries including the hospitality industry which has been characterized by a diverse workforce, a dynamic work environment, and high levels of service demands (Supina & Singh, 2024; Singh & Singh, 2022). Uniqueness of occupational risks in the hospitality industry involving hotels, restaurants, tourism services, event management, food and beverages operations include slips, trips and falls, musculoskeletal disorders, stress associated with abnormal working hours, injuries in the kitchen, and exposure to dangerous cleaning chemicals (Singh & Sihmar, 2025). To overcome these difficulties, the international OHS frameworks like the Occupational Safety and Health Management System (OSH-MS) developed by the International Labour Organization (ILO), ISO 45001, and the frameworks based on the countries with the developed regulatory frameworks such as the directives of the European Union, the standards of the United States of America, Occupational Safety and Health (OSHA), and the Work Health and Safety (WHS) Act offer systematic ways to prioritize safety in the organizational culture (Kim et al., 2016). The main reason is that these models place stake on a proactive, systematic, participatory method of dealing with risks, compliance, and promoting a work environment that values the importance of safety and wellbeing of workers as a business value. The ISO 45001 standard, in particular, puts the emphasis on the commitment of the leadership, worker involvement, identification of hazards, risk evaluation, and continuous improvement. With the implementation of this model, hospitality organizations will be able to go beyond the compliance with legal requirements and implement safety in their strategic decisions and everyday activities (Singh & Ansari, 2024). The guidelines issued by the ILO put emphasis on such social dialogue and participatory tools wherein the management and staff are encouraged to cooperate in establishing and sustaining safe working conditions. Practically it may imply the establishment of health and safety committees at hotels or restaurants, the presence of multilingual training programs to support a diverse workforce, and the creation of the environment in which employees feel empowered to report hazards without either being afraid of repercussions (Stosic et al., 2023). The OSHA rules in the U.S are focused on the safety of communication, the use of personal protective equipment, and the rights of the employees all of which are of paramount importance in the hospitality field where the employees usually work with not only dangerous substances but also with people (Singh & Sihmar, 2025; Singh & Kumar, 2024; Singh & Kumar, 2021; Singh & Ansari, 2024). In the same

Chapter 14
Psychosocial Risk Management Among First Responders:
A Comparative Analysis of Burnout Prevention Strategies in Canada and the United States

Gayle Zenia Noronha
Adler University, Canada

Nola Adelasoye
http://orcid.org/0000-0002-6893-0648
Adler University, Canada

Jason Walker
http://orcid.org/0000-0003-1944-5432
Adler University, Canada

Hawwa Shiuna Musthafa
http://orcid.org/0000-0003-1048-1541
Adler University, Canada

ABSTRACT

This chapter focusses on burnout prevention strategies among first responders in Canada, and the United States, emphasizing the interconnected roles of transformational leadership, safety culture, and digital innovations in psychosocial risk management. Foundational theories such as the Job-Demands Resources (JD-R) Theory and Leader-Member Exchange Theory (LMX Theory) were examined. Case

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studies compared Canada's Road to Mental Readiness program, and the United States' Departmental Wellness and Emerging Resilience programs were analyzed. Regulatory frameworks including Canada's Federal Framework on PTSD and decentralized, state-level statutes in the United States, including Connecticut's Senate Bill 1002/ House Bill 6595 and Senate Bill 42 of Vermont, among others, were strategically compared for structural divergences. CISM was found to be more effective when paired with other peer support programs, including digital ones. The chapter proposes a framework for a culturally responsive Occupational Health and Safety (OHS) model that emphasizes clarity in regulation, supportive leadership at organizational levels, built in peer support at the team level, and flexible technology developed in collaboration with real first responders for other first responders.

INTRODUCTION

The sound of sirens reminds us that somewhere, someone is facing an emergency. First responders, police, fire and EMS, are the professionals who step forward in those moments, working on the front lines to ensure that every situation is handled swiftly and that the safety and well-being of the broader community are protected. The very nature of their work is inherently high-risk and often carries a deeply human, often untold dimension. Given the intense demands of their respective roles, first responders frequently encounter distressing and traumatic situations, which can increase their vulnerability to complex trauma, stress, compassion fatigue, and burnout (Ceschi et al., 2022). A 2023 study among 1,101 first responders in Canada found that on average 40% experience burnout while working (Pike et al., 2023). First responders face multiple psychosocial risks, which worsen burnout and reduce job satisfaction (Walker & Stones, 2020). The emotional burden of burnout is not just heresy but has increasingly measurable negative impact.

Over 80% of first responders have experienced a traumatic event at work, with some studies citing figures as high as 85% (PTSD in First Responders, 2025) This frequent exposure to trauma places them at a higher risk for mental health conditions like Post-Traumatic Stress Disorder (PTSD), which affects roughly 1 in 3 first responders, compared to about 1 in 5 in the general population, according to SAMHSA (PTSD in First Responders, 2025). These events can vary considerably in nature and severity, ranging from immediate and violent incidents to those that unintentionally result in fatalities such as death. For instance, a study undertaken by Kaplan et al. (2024), designed to quantify the prevalence and predictors of burnout in emergency medical services personnel discovered that 60% of EMS personnel showed signs of burnout. The high prevalence rate indicates an alarming need to further study the organizational factors that add to burnout in EMS personnel

Chapter 15
Nonverbal Incivility in the Workplace:
Rethinking Organizational Politics

Renu Vij
http://orcid.org/0000-0001-9202-8390
Chandigarh University, India

Aashna Narula
http://orcid.org/0009-0002-7761-8573
Pyschopedia Journal, India

ABSTRACT

Workplace incivility, often minimized as trivial, exerts significant adverse effects on organizational dynamics especially when enacted through nonverbal channels such as gestures, posture, spatial exclusion, and facial expressions. This chapter reconceptualizes nonverbal incivility as a strategic dimension of organizational politics, grounded in theories of social power and communication. By integrating robust organizational behaviour and occupational health research, along with empirical findings from India, this study highlights how nonverbal cues contribute to psychological distress, diminished psychological safety, turnover intention, and weakened productivity. Through a proposed conceptual framework, it identifies nonverbal cues as early indicators of toxic cultural undercurrents and suggests proactive interventions. Ultimately, the chapter aims to widen the discourse on occupational well-being by illuminating the nuanced, often invisible role of nonverbal incivility in shaping workplace climates and power relations.

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INTRODUCTION

Workplace incivility, often dismissed as minor or ambiguous behavior, has far-reaching consequences for organizational health, particularly when expressed nonverbally. This chapter explores nonverbal incivility, including gestures, facial expressions, and spatial behaviour, as a subtle but potent dimension of workplace dynamics that frequently intersects with organizational politics. Drawing upon contemporary organizational behaviour theories and empirical evidence, the discussion repositions nonverbal incivility as not merely an interpersonal concern but a strategic expression of power, control, and resistance within hierarchical settings.

Workplace incivility, characterized "by low-intensity deviant behaviours with ambiguous intent to harm, such as ignoring colleagues, delivering dismissive glances, or excluding others, undermines organizational wellbeing through subtle yet pervasive means" (Andersson & Pearson, 1999). Huang, Wei and Ang (2022) defined workplace incivility as "the seemingly insignificant behaviours that are rude, disrespectful, discourteous or insensitive where the intent to harm is ambiguous or unclear". Uncivil behaviour may include behaviours such as talking down to others, making demeaning remarks and not listening to somebody (Pearson, 2010).

Though research frequently emphasizes verbal incivility, nonverbal incivility (e.g., gestures, body posture, spatial distancing, and facial expressions) remains underexplored, despite exerting critical influence over power dynamics and psychological safety in professional environments.

The cost of incivility is profound. Porath & Pearson (2013) states that 98% of employees experience incivility, 50% experiences such conduct weekly. Additionally, it has been found that monetary cost of experiencing incivility is approximately 14000$ per employee annually, the reason being cognitive distractions and project delays at work. Workers may further, try to avoid coming to workplace, withdraw from work, avoid the instigator and even be angry with their customers (Porath & Pearson, 2013). The researchers have revealed that targets of negative workplace behaviour engage less in organisational citizenship behaviour, have high turnover intentions and experience more stress (Dalal, 2005; Chiaburu & Harrison, 2008; Bowling & Beehr, 2006).

Globally, it diminishes job performance, erodes engagement, increases turnover, and damages customer relationships (McKinsey, 2016). Longitudinal evidence further reveals that incivility is not harmless; it serves as a precursor to more severe harassment and burnout-related outcomes (Vartia & Hyyti, 2022).

In conclusion, nonverbal incivility is an underappreciated yet significant driver influencing relationships at work. Subtle body language, facial expressions and spatial exclusion frequently function below the surface to affect psychological health and team relationships. By considering non-verbal cues as a component of organisational

About the Contributors

Kaan Koçali serves as a faculty member and department head in the Occupational Health and Safety Department of the Istanbul Gelişim Vocational School at Istanbul Gelişim University. Koçali completed his undergraduate education at Istanbul University-Cerrahpaşa Mining Engineering Department and earned his master's and doctoral degrees in Occupational Health and Safety from Istanbul Aydın University. He also has a multidisciplinary academic background in entrepreneurship, business administration, and engineering. In his academic career, Dr. Koçali has focused primarily on occupational health and safety, ergonomics, social security policies, and risk management. He has published numerous articles in national and international journals, presented papers at numerous scientific congresses, and contributed to various academic books. He has also served as a project manager on TUBITAK-supported projects and conducted studies on occupational safety practices in critical areas such as the mining industry, disaster management, and logistics. Koçali holds international qualifications such as ISO standards, NEBOSH, and IOSH. He plays an active role in education and quality committees at various universities and participates in international academic mobility programs as part of the Erasmus program. He has been deemed worthy of many national and international research and achievement awards for his academic achievements.

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Nola Adelasoye is a PhD student in Industrial and Organizational Psychology at Adler University and a registered clinical counsellor with the British Columbia Association of Clinical Counsellors. With a deep passion for mental health and well-being, she is dedicated to advancing psychological health in both organizational and individual contexts. Nola currently serves as a Mental Health Counsellor, where she supports clients in navigating emotional challenges, fostering resilience, and promoting personal growth. Her research and professional interests center on

workplace mental health, burnout prevention, and the intersection of leadership and employee well-being. Driven by empathy and evidence-based practice, Nola seeks to bridge clinical insight with organizational strategy to create environments where people can thrive both personally and professionally

Gaurav Bathla is having over fourteen years of experience in Academia & Industry and presently working as Professor in School of Hotel Management, Airlines and Tourism at CT University Punjab. He has received his Doctorate (PhD) in Hotel Management and Tourism from GNA University, Punjab. Dr. Bathla has authored more than 30 research papers in Scopus Indexed, UGC Approved and Peer Review Journals. He has been associated with many universities and hotel management institutions for their curriculum development and examination system. Dr. Bathla is editorial / reviewer board member of more than 8 National & International Journals. He has also organized various conferences and Faculty Development Programs in the field of Hospitality and Tourism.

Rajashree K. C is a Biomedical Engineer with a Master's in Business Administration from Saveetha University, specializing in Hospital Management and Marketing, and holds a Ph.D. in Healthcare Management. An energetic and enthusiastic professor, she excels in academics and as a multitasker, organizing seminars, workshops, cultural programs, and other extra-curricular activities. She serves as the Coordinator of NSS Unit of Saveetha School of Management, leading them to achieve multiple accolades including the Best Club award. A prominent researcher with publications in Web of Science, Scopus, and UGC-listed journals, she actively enhances her expertise through conferences, workshops, MOOCs, and certifications, including Quality Coordination in Hospitals. Awarded the "Young Academician Award" and "Young Teacher Award," she is passionate about innovation, student skill development, and inspiring young minds through exemplary teaching and mentorship.

Rajiv Gurugopinath serves as an Assistant Professor of Law at Ramaiah College of Law, Bengaluru, and is also enrolled as an advocate with the Karnataka State Bar Council. He began his academic journey with a B.A. LL.B. degree from B.M.S. College of Law, Bengaluru, and went on to complete his Master of Laws (LL.M.) in Constitutional and Administrative Law from University Law College, Bangalore University, where he authored a thesis on "Constitutional Implications of the Appointment of Judges of the Higher Judiciary in India – A Critical Evaluation." He further pursued a Master of Business Laws (M.B.L.) at the National Law School of India University, Bengaluru. Dr. Gurugopinath earned his doctorate from the School of Law, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and

Technology, Chennai, with his research focusing on "Right to Health – A Study on the Legal Framework and Its Implementation with Special Reference to Bangalore Urban District." An active academic and practitioner, he has presented and published widely in national and international conferences, delivered invited lectures, judged moot courts and legal events, and engaged as a resource person in diverse forums. His teaching and research interests span Constitutional Law, Administrative Law, Jurisprudence, Criminal Law, Business and Intellectual Property Law, as well as Health and Medical Laws. Drawing from both advocacy and academia, he emphasizes a balanced, practice-oriented approach to legal education.

Junaid Hassan is an Assistant Professor in the School of Management and Commerce at Sanskriti University. He earned his PhD from the Central University of Kashmir and has since dedicated himself to teaching, research and academic mentorship. Dr. Hassan's research spans consumer behavior, tourism economics, entrepreneurship, and regional development, reflecting his interest in understanding how economic and social dynamics influence business and society. He has presented his work at numerous national and international conferences and has published in reputed journals, contributing significantly to the academic community. Beyond research, Dr. Hassan is committed to nurturing critical thinking and professional growth in his students, fostering an environment of learning, innovation, and scholarly excellence.

Subramaniam Seshan Iyer is a distinguished academic and Professor at the Datta Meghe Institute of Management Studies, Nagpur, with extensive experience in teaching, research, and academic leadership. Known for his commitment to excellence in management education, he has played a significant role in mentoring students and contributing to curriculum development and institutional growth. Dr. Iyer's scholarly interests span key areas of management studies, and he has actively participated in research, publications, seminars, and conferences. His dedication to academic rigor, ethical values, and professional development has earned him respect among students and peers alike, making him a valued member of the academic community.

Ramya Krishnappa is an accomplished legal academic and Assistant Professor of Law at the School of Law, Christ University, Bengaluru. A member of the Karnataka State Bar Council, she graduated with a B.A. LL.B. from B.M.S. College of Law, Bengaluru. She went on to pursue her Master of Laws (LL.M.) in Constitutional and Administrative Law at KLE's Law College, Bengaluru, where she was awarded a Gold Medal for academic excellence. Her doctoral research was undertaken at Christ University, Bengaluru, where she earned a Ph.D. in Law on

the theme "Study on the Legal Framework and Working of Panchayat Institutions with Special Reference to Mandya District." Her scholarship reflects a deep commitment to grassroots governance and constitutional development. With over six years of combined teaching, research, and practice experience, Dr. Krishnappa has established herself as a dedicated educator who prioritizes interactive learning, critical analysis, and student engagement. She is passionate about mentoring young law students, advancing legal research, and contributing meaningfully to both academia and practice.

T.C. Manjunath was born on 6th February 1967. He did his B.E. from RV College of Engg. in 1989 (B'lore Univ), M.E. in Robotics & Automation from Govt.'s LD College of Engg., (Gujarat Univ., Ahmedabad) in 1992 with FCD-First Rank & PhD in Systems & Control Engg. from IIT Bombay in the year 2007, got best research scholar award for the entire IITB. He is currently working as the Dean Research (R & D) and as Professor in Dept. of Computer Science & Engg. with specialization in IoT, Cyber Security, Blockchain Technology in Rajarajeswari College of Engineering, Bengaluru, Karnataka. He has got a teaching (academic), research & administrative experience of more than 35+ years (10 years as Principal & 8 years as HoD, 1 year as Dean Research & rest as faculty) and has published more than 1500+ research papers in various national & international journals & conferences, with 175+ patents, 100+ book-chapters, 25 awards, 100s of Keynote talks and also published 25 text books in various field of science, engineering & technology, completed projects worth Rs. 9 Crores till date & guided 10 PhD scholars in VTU. He is a member of 30 Professional Society Chapters and is a fellow of IE, IETE, AMIEE, Sr. Member of IEEE and a chartered engineer.

Hawwa Shiuna Musthafa, Ph.D. is an accomplished researcher, academic, and educator with over 15 years of experience in the higher education sector. She previously served as an Assistant Professor in the Department of Leadership and People Management at University Canada West (UCW), where she also held the position of Vice Chair of the Research Ethics Board (REB). She currently serves as an Adjunct Professor at Adler University and as a Board Member of the Adler Research Ethics Board, teaching Capstone courses in the Master's programs in Industrial-Organizational Psychology and Health and Wellness Psychology, as well as Research Methods courses. She also serves as Associate Faculty at City University of Seattle, where she teaches Research Methods and Statistics. With extensive expertise in social sciences, research methods, educational leadership, research ethics, management, educational effectiveness, curriculum development, higher education policy, and matters concerning to children, youth, women, her passion is for research that makes impact and brings meaning and empowerment to ordinary

people and informs effective practices improve livelihoods. She serves as a reviewer for leading Q1 journals, including Studies in Educational Evaluation and Cogent Education, and also serves as reviewer to international academic conferences such as European Association for Research on Learning and Instruction (EARLI). An experienced educator, Dr. Musthafa has led course development, curriculum design, and professional workshops across multiple programs, demonstrating expertise in teaching, learning strategies, and student-focussed pedagogies. Dr. Musthafa's contributions to academia have been recognized through awards, including a Presidential Award by the President of the Maldives.

Gayle Zenia Noronha recently completed her Master's in Industrial & Organizational Psychology at Adler University. She currently works as a Senior Outreach Coordinator with Vancouver Second Mile Society. She is passionate about wellbeing among seniors and empowering first responders to thrive. Gayle's love of research blossomed through her childhood love of reading and continued to bloom through school and high school level essay competitions. Research and writing appeal to Gayle as she explores various mental health issues among her populations of interest. Gayle's background in counselling and her interest in Psychology are a key motivator that propel her research interests.

Ayşenur Öktem Özgür graduated in 2010 from the Department of Labor Economics and Industrial Relations, Faculty of Economics and Administrative Sciences, Muğla Sıtkı Koçman University. In the same year, she was appointed as a research assistant at the Department of Labor Economics and Industrial Relations, Human Resources and Management Program, Karamanoğlu Mehmetbey University. Between 2011 and 2018, she was assigned to Dokuz Eylül University to complete her graduate studies. In 2014, she completed the Master's Program with Thesis in Human Resources, Department of Labor Economics and Industrial Relations, Institute of Social Sciences, Dokuz Eylül University. She received her Ph.D. in Labor Economics and Industrial Relations from the same university in 2021. Since 2023, she has been serving as an Assistant Professor at the Department of Political Science and Public Administration, Faculty of Economics and Administrative Sciences, Karamanoğlu Mehmetbey University. Her research interests include career anchors, employability, elderly employment, the silver economy, decent work, and gender issues.

P. Praveen Kumar holds an MCom, MBA, and PhD in Finance from Pondicherry University. He secured the University 1st Rank in his Under Graduation. His teaching interests include Financial Accounting, Financial Management, Mergers & Acquisitions, Security Analysis & Portfolio Management, and other finance-related courses. His research interests extend to interdisciplinary areas.

P. Selvakumar is currently an Associate Professor in the Department of Science and Humanities at Nehru Institute of Technology, Coimbatore, Tamil Nadu, India. Prior to joining Nehru Institute of Technology, he held positions as an Assistant Professor in the Department of Science and Humanities various engineering colleges in Coimbatore, Tamil Nadu, India, spanning from 2011 to 2023. Dr.P. Selvakumar's academic and research interests lie primarily in the field of phytochemistry. He has made significant contributions to his field, with an impressive record that includes 30 journal publications, 12 patents, and 20 conference papers. Additionally, he has organized 5 seminars and conferences, further demonstrating his commitment to academic and scientific exchange. Throughout his career, Dr. P.Selvakumar has been recognized for his dedication and excellence in teaching, having been honored with several awards, including the Best Teacher Awards. He holds a prominent position in the academic community, contributing actively to research.

Rishabh Patel is a student at the Datta Meghe Institute of Management Studies, Nagpur, pursuing his studies in management with a strong interest in academic learning and professional development. He is dedicated to building a solid foundation in management concepts and actively engages in coursework and institutional activities. Rishabh is committed to developing analytical, leadership, and practical skills that will support his future career, reflecting enthusiasm for continuous learning and personal growth.

Kalai Selvi R Assistant Professor in the Department of Computer Science and Engineering at Kuppam Engineering College. She received the B.Tech degree in Information Technology from Anna University and the M.Tech degree in Information Technology from Anna University; 2015.Her research interests include (list 3–6 areas such as Machine Learning, Artificial Intelligence, Data Science, Advanced Data Structure, Compiler Design, etc.). She has published research papers in reputed journals and international conferences, including IEEE, Springer and has guided several undergraduate projects in emerging technology domains.

Shobarani Ranganathan is currently working as a Professor and Addl.HoD in the Department of Artificial Intelligence at Dr. M.G.R. Educational and Research Institute, Maduravoyal, Chennai, TamilNadu. She has got 24 years of experience in teaching and ten years of experience in Research. She has completed her Ph.D. degree from Mother Teresa Women's University, Tamil Nadu, India in Feb 2014 and her areas of interest are Image Processing, Machine Learning and Cyber Security. Moreover, she has published research papers in various UGC, Scopus indexed, SCI journals, and patents published at the international level. Currently she is guiding 8 Ph.D scholars and 8 scholars received their PhD degree under her supervision..

Also acting as Doctoral Committee members for internal and external scholars. She can be contacted at email: shobarani.cse@drmgrdu.ac.in.

Undabatla Rambabu is an Associate Professor in the Department of MBA at Lakireddy Bali Reddy College of Engineering, Mylavaram, with over 16 years of teaching and research experience. He specializes in Managerial Economics, Financial Management, Security Analysis, and Financial Accounting. A Ph.D. holder in Commerce & Business Administration from Acharya Nagarjuna University, he has published extensively in reputed journals, presented at national and international conferences, and received multiple awards for academic excellence, including the NPTEL Discipline Star Award and Best Faculty Award for 2021–2023.

Varinder Singh Rana Passionate, resourceful, and innovative professional, with 22 years Academic and Industry career demonstrating consistent success as an Administrator and Educator at higher education levels. Outstanding track record in assuring student success. Recognized for teaching excellence based on technical, research, and design fundamentals. Strong follow-through, administrative and time management capabilities. Highly articulate, demonstrating refined interpersonal skills across all levels and backgrounds. Effective communicator with excellent planning, organizational, and negotiation strengths as well as the ability to lead, reach consensus, establish goals, and attain results. Received Doctorate (PhD) in Hospitality from Amity University, Noida and postgraduate in Hotel Management and Catering Technology from St Peters University, Chennai and obtained his Bachelors in Hotel Management from Bangalore University in 2001. 21 years of experience in Academia and Industry. Provided services to Lovely Professional University, GNA University, Punjab Tourism Development Corporation and various reputed hotels. Have 11 Limca Records in account. General Secretary of Chefs Association of Five Rivers which is the nodal body of Indian Federation of Culinary Associations (IFCA). Member of Board of Management and Academic Council of GNA University and Board of Studies member of various Universities. Authored 12 books and 30 Research papers. Served as head chef to honourable President of India and President of Republic of Afghanistan during their visit to Punjab. Certified Master trainer of Food Safety and Standards Authority of India. Awarded by Phagwara Administration for outstanding professional work in 2017. Star Achiever Award for regional culinary development from Indian Federation of Culinary Associations. Honoured by Tourism Minister of Punjab for initiating a Bakery Unit at Central Jail, Ludhiana. Presence as Jury of Master Chef Punjabi-A Cookery Reality Show of DD National Punjabi. Cooking shows on National Television. Represented State of Punjab in Republic day Celebration at Red Fort, New Delhi. Jury in ICF and IFCA events at National and International Level. He

has been awarded with Best Culinary Educator award by Indian Federation of Culinary Association (A Nodal Body of Ministry of Tourism, Government of India). Won Two silver Medals and one bronze medal for Republic of India (Our Nation) at International Culinary Challenge, Uzbekistan where 22 countries participated. Associated with many projects of Punjab Heritage and Tourism Promotion Board.

Ninad Satish Rithe is a dedicated management student currently pursuing his Master of Business Administration (MBA) in the Department of MBA at Datta Meghe Institute of Management Studies, Nagpur, Maharashtra, India. He demonstrates a strong interest in Human Resource, leadership development and collaborative teamwork, along with a keen focus on effective communication, analytical thinking, and problem-solving. With a commitment to continuous learning and professional excellence, Ninad aims to apply academic knowledge to real-world business challenges while contributing meaningfully to organizational growth and team success.

Shubhashree Sahoo is a distinguished faculty member in the Department of Computer Science and Engineering (Artificial Intelligence & Machine Learning) at Sphoorthy Engineering College, Hyderabad, Telangana. She earned her Ph.D. from Biju Patnaik University of Technology, with her research carried out in collaboration with the Defence Research and Development Laboratory (DRDL), focusing on advancements in Artificial Intelligence. Dr. Sahoo brings a wealth of knowledge and expertise to the field of AI & ML, contributing significantly to both academic and applied research.

Amrik Singh is working as Professor in the School of Hotel Management and Tourism at Lovely Professional University, Punjab, India. He obtained his Ph.D. degree in Hotel Management from Kurukshetra University, Kurukshetra. He started his academic career at Lovely Professional University, Punjab, India in the year 2007. He has published more than 65 research papers in UGC and peer-reviewed and Scopus/Web of Science) journals. He has published 12 patents and 01 patent has been granted in the inter-disciplinary domain. Dr. Amrik Singh participated and acted as a resource person in various national and international conferences, seminars, research workshops, and industry talks. His area of research interest is accommodation management, ergonomics, green practices, human resource management in hospitality, waste management, AR VR in hospitality, etc. He is currently guiding 8Ph.D. scholars and 5 Ph.D. scholars have been awarded Ph.D.

Vijayasree Srinivasan is a Manager – Operations at Geri Care, Chennai, with a strong background in hospital operations and healthcare administration. She is a final-year PhD scholar, focused on advancing her expertise in healthcare systems and

operational excellence. Passionate about improving care delivery and organizational efficiency, she is committed to driving meaningful and sustainable impact within the healthcare industry.

Vijay Uprikar is a passionate Faculty of Marketing Management at Datta Meghe Institute of Management Studies, Nagpur. With over 20 years of blended experience in academics and pharmaceutical industry, he demonstrates a unique blend of corporate insights and academic expertise to the world of marketing education. A firm believer in innovative pedagogy, have developed study materials that hold six copyrights, designed to enhance conceptual clarity in marketing management. His interdisciplinary research explores Mahatma Jotirao Phule's contributions to Entrepreneurial Social Responsibility (ESR), integrating historical and social perspectives into contemporary management frameworks. With a strong foundation in management education, Dr. Uprikar has contributed significantly to the academic and professional development of students through his expertise and dedication. His work focuses on fostering innovation, leadership, and excellence in the field of management. A respected figure in the academic community, Dr. Uprikar continues to play a vital role in shaping future business leaders.

Hiremath V.M.R. is a committed academician and emerging researcher currently serving as an Assistant Professor in the Department of MBA at Rao Bahadur Y. Mahabaleswarappa Engineering College (RYMEC), Ballari, Karnataka. With a strong academic foundation and a growing research profile, he is dedicated to advancing management education through effective teaching, student mentorship, and scholarly engagement. He holds a Master of Business Administration (MBA) with specializations in Human Resource Management and Marketing, equipping him with interdisciplinary knowledge across people management and market strategy. Further strengthening his academic journey, he is presently a Research Scholar at Srinivas University, where he is pursuing his Ph.D., focusing on advanced management and research domains. His doctoral pursuit reflects his commitment to contributing meaningful insights to business and management studies. As an educator, HIREMATH V.M.R. is known for his practical and student-centered teaching approach. He integrates conceptual frameworks with real-world case discussions, encouraging students to develop analytical thinking, leadership ability, and problem-solving skills. He actively supports experiential learning, presentations, and collaborative academic activities that prepare students for professional environments. In addition to his academic role, he possesses strong technical and administrative skills, including proficiency in MS Office tools, which support his work in teaching, research documentation, and academic coordination. He is also multilingual, enabling him to communicate effectively with diverse student groups

and contribute to inclusive learning environments. Earlier in his academic and social engagement journey, he was honored with the "Best Volunteer" award in the National Service Scheme (NSS), highlighting his spirit of community service, leadership, and social responsibility. This recognition reflects his balanced commitment to both academic excellence and societal contribution.

Renu Vij is a seasoned educator with a robust 16-year career in teaching at the master's level Strategic HR courses . She has made significant contributions to academic research, authoring over 15 research papers published in Scopus-indexed journals and contributing chapters to Scopus-indexed books. Her expertise extends beyond academia, as she is a certified trainer in HR analytics and an accomplished workplace psychologist. Additionally, she holds certification from AON, further solidifying her credentials in the field. Her work reflects a deep commitment to advancing knowledge in her areas of specialization, making her a respected figure in both academic and professional circles.

Jason Walker is an internationally recognized, award-winning scholar, practitioner, and author, widely known for his influential voice in trauma-informed leadership and workplace mental health. A contributing writer for Forbes, he leads the Graduate Programs in Health and Wellness Psychology and Industrial-Organizational Psychology at Adler University, and serves as a clinical adjunct professor in the School of Health and Social Sciences at City University of Seattle Master of Counselling Program. His work has been featured in Newsweek, MSN, Yahoo!, and other major outlets. A sought-after speaker and trusted advisor, he is known for translating complex psychological challenges into practical, evidence-based strategies that create meaningful change.

Ozlem Yurtsever graduated from the Department of Chemical Engineering at the Faculty of Engineering, Marmara University, in 2006. She received her Ph.D. in Industrial Engineering from the same university in 2019. Between 2011 and 2022, she served as a lecturer at the Vocational School of Technical Sciences of Marmara University and has been working as an Assistant Professor since 2022. Her research interests include sustainability, carbon footprint, energy, and occupational safety.

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