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**The Impact of Occupational Safety Practices and Their Challenges on  
Improving the Work Environment in Oil Refining Companies: An  
Applied Study in the City of Yanbu**

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أثر ممارسات السلامة المهنية وتحدياتها على تحسين بيئة العمل في شركات تكرير النفط: دراسة  
تطبيقية في مدينة ينبع

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## Dedication

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To those who, after God, played a significant role in helping me reach this milestone.

To those who taught me that perseverance and hard work are the true keys to success.

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## **Abstract**

This study investigates the impact of occupational health and safety (OHS) practices and their implementation challenges on the work environment within oil refining companies in Yanbu Industrial City, Saudi Arabia. The research adopts a descriptive-analytical approach using a quantitative methodology based on a structured questionnaire distributed to 50 employees across various roles. Findings indicate a significant positive correlation between effective OHS practices and improvements in both the physical and psychosocial aspects of the work environment. However, the study also highlights critical challenges that hinder optimal implementation, including insufficient training, limited employee engagement, and organizational resistance to change. Leadership commitment and clear communication emerged as pivotal factors influencing safety culture and employee motivation. The study emphasizes that integrating safety into operational strategies enhances job satisfaction, reduces occupational risks, and fosters a sustainable work environment. This research contributes empirical insights relevant to policymakers, industry leaders, and scholars by addressing a gap in the context of Saudi industrial zones, particularly in Yanbu. The results underscore the strategic necessity of overcoming implementation barriers to establish an effective OHS framework that aligns with both regulatory standards and organizational goals.

## **Keywords:**

Occupational Health and Safety, Oil Refining Industry, Work Environment

## المستخلص

يهدف هذا البحث إلى دراسة أثر ممارسات السلامة والصحة المهنية والتحديات المرتبطة بتطبيقها على تحسين بيئة العمل في شركات تكرير النفط بمدينة ينبع الصناعية في المملكة العربية السعودية. اعتمدت الدراسة المنهج الوصفي التحليلي باستخدام الأسلوب الكمي، من خلال استبانة وزعت على عينة مكونة من 50 موظفًا من مختلف المستويات الوظيفية. أظهرت النتائج وجود علاقة إيجابية ذات دلالة إحصائية بين فاعلية ممارسات السلامة المهنية وتحسين بيئة العمل سواء من الناحية المادية أو النفسية. كما كشفت الدراسة عن مجموعة من التحديات التي تعيق التطبيق الأمثل لهذه الممارسات، مثل ضعف التدريب، وقلة مشاركة الموظفين، ومقاومة التغيير داخل بيئة العمل. وتبين أن التزام القيادة ووضوح التواصل من العوامل الحاسمة في تعزيز ثقافة السلامة ورفع دافعية الموظفين. تؤكد الدراسة أن دمج ممارسات السلامة ضمن استراتيجيات التشغيل يسهم في رفع مستوى الرضا الوظيفي وتقليل المخاطر المهنية وتهيئة بيئة عمل مستدامة. تقدم هذه الدراسة رؤى تطبيقية تسد فجوة بحثية تتعلق ببيئة العمل في المدن الصناعية السعودية، وتبرز الحاجة الاستراتيجية لتجاوز تحديات التطبيق لضمان فاعلية نظم السلامة بما يتماشى مع المتطلبات التنظيمية وأهداف المؤسسات.

## الكلمات المفتاحية:

السلامة والصحة المهنية، صناعة تكرير النفط، بيئة العمل

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# CHAPTER 1

## **Introduction**

The oil and gas industry is universally accepted as one of the most dangerous industries because of the nature of its productions that entail use of flammable compounds, high pressures and complicated machineries. Occupational health and safety (OHS) has therefore been developed as a very essential aspect in the well-being of employees and sustainable nature of activities undertaken in this industry. The world is now spending a lot on ensuring that there are effective safety measures set in place as a way of curbing the number of accidents and occupational illnesses in the work places. Nevertheless, the industry has maintained several challenges in the complete application and maintenance of these safety measures despite the enhancement in technology and regulation strategies. Kelechi and Faith (2023) argue that although numerous enterprises within oil and gas sector are equipped with well-elaborated risk and management strategies and safety measures, the real-life practice may be underdeveloped because of a number of systematic and operational constraints. Such obstacles comprise the lack of proper training, enforcement tools, deficient safety culture and investment in prevention measures. These challenges do not only put employees at risk of physical injury but it also raises the chances of unsuccessful operations and loss of definite incomes.

In this global scenario, the Middle East and Saudi Arabia in particular is a special case owing to the fact that Middle East is a major producer of oil and is dependent on petrochemical industries. The Kingdom had exerted great efforts to harmonize industrial practice with the international safety standards especially in areas that are considered industrial centers like the city of Yanbu. The Royal Commission for Jubail and Yanbu (RCJY) operates Yanbu Industrial City that consists of some of the largest oil processing refineries and petrochemical plants in the area. This set of facilities functions in an environment, which is characterized by focus on productivity, efficiency and responsibility in terms of environment. Nonetheless, just like it is the case in most other industrial areas across the globe, the topic of occupational safety has become an eminent issue.. Although regulatory bodies and corporate entities have established guidelines for workplace safety, the actual enforcement and adherence to these practices vary considerably across different organizations.

The research conducted by Bo Bo Oo (2022) highlights the influence of occupational health and safety behaviors on employee motivation and performance, according to which, workers, who feel secure in their work environment, are more willing to display a higher level of engagement, productivity, and loyalty. Such correlation is especially important in the so

called high-risk industries e.g. oil refining where employee morale may be directly affected by the inadequacy of safety measures felt. That absence of the adequate means of security may result in lack of motivation, high turnover rates and decreased performance rates. This, in its turn, impacts not only continuity of operations but also image and even reputation of the concerned companies. Hence, to provide safe working environment is not a regulatory requirement but a strategic need that conforms to human, as well organizational outcomes.

The dilemma faced especially in developing countries especially those with high rate of industrialization lies in the aspect of developing the economy as well as ensuring that the safety concerns are well taken care of. Anbessie (2019) states that old safety structures, insufficient training prospects and absence of organized safety review are common issues in numerous industrial enterprises. This is coupled by the fact that managerial attitudes focus more on the production targets than welfare of employees. Although this kind of attitude can lead to short-term gains, then the risks should be kept in mind about workplace accidents, legal liabilities, and worker satisfaction which are considered long-term risks. This can be disastrous in case of oil refineries in which risk factor is itself very high. Among other possibilities, scarcity of safety management may result in fires, explosions, toxic leaks, mechanical failures, and so on.

In Saudi Arabia, the Vision 2030 has taken serious concern in enhancing the quality of life that encompasses the working conditions of different sectors. The initiative aims at promoting companies to arrive at optimal practice in career well being and occupation condition improvement and in modernizing career safety frameworks. As in the case of industrial cities such as Yanbu, this gives a chance to evaluate and improve the existing situation with regard to safety practice, of the oil refining industry. The companies are bearing the assumption of making safety part of their strategic planning as well as their operational routines. This not just includes only the national regulations but also the international ones like ISO 45001 occupational health and safety management systems.

However, challenges discovered during the implementation of these frameworks come up. Some firms will not have the needed technical knowhow and others might not gain cooperation of employees and the employees might consider the new safety measures as being a burden and not necessary. The safety initiatives may also be compromised by budget limits, bureaucratic sluggishness, and disjoint communication pathways. In that kind of situations, it is important to come up with empirical studies that capture the lived experiences

of employees and managers of such environments. In this way, researchers will be able to determine the concrete enablers and the barriers of proper safety practice implementation and suggest the specific interventions that can be proposed in accordance with company resources and employees demands.

The proposed study will focus on an area of knowledge that is already established i.e. the study of how occupational health and safety practices are being undertaken in oil refining companies within the Yanbu region, and how the same is impacting on the quality of the working environment. The study will not only be concentrated on finding out the current practices but also go deeper to look at the impediments that are impeding the effective implementation of the practices. In addition, the research shall explore the attitude of the workers towards workplace safety, their involvement in safety programs and how safety aspects have influenced their performance at work and overall well-being. By adopting a case study approach within the unique industrial context of Yanbu, the research aims to provide practical insights that can inform policy development, managerial strategies, and employee training programs.

Finally, the present study aims at outlining the importance of occupational health and safety in determining the working environment in high risk sectors like oil refining. As it could be observed in the past literature, safety, or a priority and well-managed one, generates a domino effect that positively affects numerous other variables such as employee morale, efficiency, and resilience. On the contrary, the impact of ignoring safety may be disastrous that goes beyond the direct physical injury to the workers. Thus, it is crucial to explore how safety practices operate and what complications revolve around them in order to create an environment that is sustainable and productive in the industrial system of Yanbu and other places.

## **Research Problem**

Even though in high-risk industries like oil refining, much is understood about the significance of occupational health and safety (OHS) issues, a number of organizations still experience tremendous difficulty in the implementation of the safeguards that help in the protection of employees as well as the improvement of the working environment. In such industrial centers as Yanbu which is the hub of large scale oil refineries where the very core of the local and national economy revolves; this settlement provides a safe and healthy working environment, which is not merely a legal or ethical requirement but also a strategic need. Nevertheless, it is not rare to see the significant difference between the stated safety policies and practices on the field. Lack of enough training, employee participation, enforcement mechanisms and availability of resources is against a successful implementation of OHS measures. Also, the understanding of workers on safety and their participation in achieving that has not been greatly discussed in the Saudi industrial environment.

This study therefore seeks to address the following central research question:  
**How do occupational health and safety practices, along with their associated challenges, influence the improvement of the work environment in oil refining companies in Yanbu?**

## **Importance of Research**

### **1. Scientific Significance**

- Enhances academic understanding of how occupational health and safety (OHS) practices influence work environments in high-risk sectors, particularly in the oil refining industry.
- Fills a gap in the literature by focusing on the context of Yanbu, a key industrial city in Saudi Arabia, which has not been extensively explored in prior research.
- Contributes to the body of knowledge concerning the relationship between safety management systems and employee well-being in the Middle East.
- Provides empirical data that may support the development of theoretical models linking OHS practices to organizational performance and safety culture.

### **2. Practical Significance**

- Helps safety managers and decision-makers in oil refining companies identify key challenges and weaknesses in current safety practices.
- Supports the design of more effective, context-specific strategies to enhance workplace safety and employee engagement.
- Offers actionable recommendations for improving safety training, communication, and compliance mechanisms within industrial settings.
- Assists regulatory bodies and policymakers in refining national safety standards and enforcement strategies based on real-world data from a strategic industrial zone.
- Contributes to the broader goals of Saudi Vision 2030 by promoting safer, more productive, and human-centered work environments in vital economic sectors.

## **Study Objectives**

- To examine the current occupational health and safety (OHS) practices implemented in oil refining companies in Yanbu.
- To identify the main challenges and obstacles that hinder the effective application of safety measures in these companies.
- To assess the impact of OHS practices on the quality of the work environment and employee well-being.
- To explore employees' perceptions and attitudes toward workplace safety protocols and culture.
- To provide practical recommendations for enhancing safety performance and creating safer work environments in the oil refining sector.
- To contribute data-driven insights that support the development of improved safety policies and training programs tailored to the Saudi industrial context.

## **Study Questions**

### **Main Question:**

- How do occupational health and safety (OHS) practices, along with their associated challenges, influence the improvement of the work environment in oil refining companies in Yanbu?

### **Sub-Questions:**

- What are the current OHS practices implemented in oil refining companies in Yanbu?
- What are the major challenges that hinder the effective implementation of these safety practices?
- How do employees perceive and respond to the safety measures applied in their workplace?
- In what ways do OHS practices affect employee well-being, motivation, and job performance?
- What strategies can be adopted to overcome existing safety challenges and enhance the overall work environment in the oil refining sector?

## **Study Hypotheses**

H1: fThere is a significant positive relationship between the implementation of occupational health and safety (OHS) practices and the improvement of the work environment in oil refining companies in Yanbu.

H2: The presence of safety-related challenges negatively affects the effectiveness of OHS practices in oil refining companies.

H3: Employees who perceive their work environment as safe demonstrate higher levels of motivation and job performance.

H4: Companies that invest in continuous safety training and awareness programs experience fewer workplace accidents and higher compliance with safety protocols.

## **Scientific theory followed**

### **1. Understanding Occupational Health and Safety in the Oil and Gas Industry**

Occupational health and safety (OHS) is one of such key pillars in the high-risk industries like oil and gas, where the daily activities of the industry subject workers to a great number of hazards, e.g. hazardous chemicals, flammable compounds, heavy-duty equipment, and high-pressure schemes. Safety in this context yields not only as a compliance issue but also as a strategic issue to the well being of employees as well as continuity of operation. Safety management systems in the oil and the gas production are complicated, where the risks are sought to be reduced and avoiding accidents. Nonetheless, as Acheampong and Kemp (2022) in their examination of UK Continental Shelf note, the conformity with regulatory recommendations does not inevitably lead to the decline in the rate of incidents. Although regulation is important to set the basic expectations and processes to follow, it rarely reflects cultural differences in organization and its leadership style as well as individual obedience. Their effort stresses that efficient safety performance is the product of a combination of regulation, monitoring, internal policy, and human interaction, which have to be theoretically taken into consideration within the area of investigation of OHS in the Kingdom of Saudi Arabia at the oil refineries.

### **2. Regulatory Models and Institutional Safety Frameworks**

Regulatory-wise, the practice of health, safety, and environmental (HSE) in the oil and gas sector is bound to both international and local regulations that provide certain mandates on identifying the hazard, preventing the strains, training, and reporting the accidents. According to Acheampong and Kemp (2022), the regulatory institutions usually compose a mosaic of prescriptive and goal-setting methods. The former directs on certain procedures, whereas the latter focuses on results and accountability of the organization. In their work about safety of offshore oil, they discovered that although tighter control did induce certain performance advances, there was diversity in the way that such regulations were understood and applied between companies. This shows the necessity of the theoretical models which are flexible up to the extent of accepting the variety in the organizational reaction to regulation. In Saudi Arabia, such dynamics can be found, especially in industrial towns such as Yanbu where a mixture of national regulations regarding labor and international regulations in the field of safety are in effect. The theoretical framework of this research thus presupposes the assumption that the external regulation creates a structural background on which the

organizational and human factors are deployed and influence the process of introducing and efficiency of the safety practices.

### **3. Safety culture and climate in the organization**

The increasing amount of theoretical literature focuses not on the aspect of regulation but on the organization behavior, in particular, on the notions of safety climate and safety culture. Safety climate can be defined as the perceptions safety has in an organization by the workers, whereas safety culture can be described as deeper rooted shared values and norms that shape human behavior. The latter two of the constructs are imperative in considering safety practices as either vital or cosmetic to the work force. Naji et al. (2022) discuss such dynamics, investigating the impact of organizational communication and actions of leadership behaviors on the experience of psychosocial hazards among employees working in the oil and gas sectors. Their results indicate that individual employees tend to experience psychological security, respect and motivation when the leadership actively promotes safety programs, and promotes communication that is not only effective but also coherent and frequent. In theory, this implies that organizational climate plays the role of a moderating factor to interrelate formal safety systems with employee attitudes and behaviors. Safety climate and leadership behavior in conditions of the current study will also be core issues to the study of the impact of occupational safety on the general workplace.

### **4. Leadership and its Competence in Formulating Safety Practices**

The importance of leadership theory in this process is the explanation of the adoption and maintenance of safety initiatives within organizations. Specifically, transformational leadership has been found to be a potent safety engagement driver because it stimulates proactive action, empowers workers, and cultivates a sense of the collective responsibility. Naji et al. (2022) asserted that visible safety commitments such as modeling the right behavior, providing rewards to the safe practice, and punishing unsafe behaviors make safety an organizational commitment that is shared by its leaders. They have pointed out the centrality of the communication as the means of supporting safety messages and building trust through their research. As far as this is concerned, leadership does not merely imply the issuance of orders but rather the establishment of psychological circumstances, where employees would feel competent and emotionally compelled to focus on safety. This theoretical approach forms an important input to the work environment, as witnessed in the

oil refineries located in Yanbu, in which the hierarchical structure of the organization, whether it favors or opposes employee involvement in the safety systems.

### **5. Knowledge, Attitudes, and Individual Compliance**

Organizational structures and leadership are only thought to be a precursor to individual behavior that then brings the strength of success or the failure of the safety intervention. The Theory of Planned Behavior (TPB) presents a practical perspective with which one can gain insight on how individuals comply with OHS practices. This theory assumes that behavior has the shape of intention and due to intention, it is dependent on attitudes, subjective norms and perceive behavioral control. Quaigrain et al. (2022) used this theory in their research of oil and gas workers in Ghana, where the authors considered the influence of knowledge and attitudes on compliance. According to their findings, highly OHS-educated workers of positive safety-minded attitudes have high chances of following with protocols. On the other hand noncompliers tend to break rules when they feel that the safety measures are either not necessary or inconvenient. Such findings advocate the use of a theoretical approach that employs cognitive and motivational influences to the conceptualization of employee behavior. In the present case, the TPB model will assist in describing the influence of individual associations, planned by organizational communication and past experience, in the execution of the operations of safety practices in practical circumstances.

### **6. Quality of work environment and Psychosocial Hazards**

Although the improvement of work environment, which is the dependent variable, in this study, is concerned with physical manifestations of the job environment, it also covers the psychosocial aspects of the kind of job, such as stress, job satisfaction, autonomy, and interpersonal relations. These constructs are theoretically based upon Job Demands-Resources (JD-R) model that proposes that work outcomes apply to the interaction between job demands (e.g., workload, pressure of time, hazards) and job resources (e.g., support, feedback, safety measures).

Naji et al. (2022) take this model to explain psychosocial hazards in the oil and gas industry and conclude that stress and mental fatigue among workers are exacerbated by weak leadership styles and poor communication as well as high pressure of operations. According to their study, strong safety systems should could be used to act as the job resources providing protection against negative impacts of job demands. Theoretically, this confirms the convention that safety is not only about avoiding accidents but rather, it is also about ensuring

psychologically-facilitating work environment. This model fits well on the industrial sector in Yanbu considering that the work in oil refining is very competitive where small mistakes have a huge price.

## **7. Interplay between the safety practices and work environment**

After aligning the multiple strands of theories, that is, regulatory frameworks, organizational culture, leadership theory, behavioral models, and the JD-R framework, it might be clear that the same relationship between OHS practices and quality of work environment is dynamic and multifaceted. Sound safety practices can not just eliminate physical risk but also lead to trust building, better communication, and the development of the feeling of stability among the working population. On the other hand, the inability to adopt or practice such behaviours may result in an atmosphere of tension, detachment, and low morale. Given the high correlation between encompassing safety systems and a larger organizational focus on the well-being of the employees, it would seem that the former is often an indicator of the latter, which subsequently leads to higher performance and retention. Systems-thinking approach is the foundation of this study in theoretical terms, but its application is regarded as a complex behavioral, biological, and social environment. This view is particularly applicable in event such as oil refineries which are sensitive, risky environments where a little bit of loss of safety means huge losses to the individual involved, as well as to the organization at large.

## **8. Applicability to the Saudi Industrial Context**

Although the above-mentioned theories have been crafted and applied at various domains within the international environment, they must be exercised in Saudi Arabia and more so in Yanbu with sensitivity. Industrial City of Yanbu is a socio-economic and regulatory environment that is fast industrialized, multicultural, and also undergoing an economic transformation under Vision 2030. Such contextual factors may persuade the safety practises understanding, acceptance, and realisation. As an example, organizational cultures can create a hierarchical culture which can influence the comfort level of employees to report hazards or recommend an improvement. Also, language and cultural differences may become the source of unfavorable training and communication. Consequently, albeit the theoretical questions above constitute a sturdy base, local adjustment of the employment models will be one of the main characteristics of this research. This study will allow creating a sophisticated view of the influence of OHS practice on the working environment of the Saudi oil refining firms by combining specific field observations with local data.

# CHAPTER 2

## **Introduction**

Occupational health and safety (OHS) have emerged as critical focal points in high-risk industries, particularly in the oil refining sector, where workers are routinely exposed to hazardous materials, heavy machinery, and complex operational risks. The significance of OHS practices extends beyond mere regulatory compliance; it directly influences organizational performance, employee well-being, and the sustainability of operations. Consequently, understanding the theoretical foundations and empirical findings related to OHS is essential for analyzing its role in enhancing the work environment.

This chapter aims to provide a comprehensive review of relevant literature that addresses the multifaceted nature of occupational health and safety within the context of oil refining industries. The review will critically examine existing theoretical models, regulatory frameworks, and organizational approaches that govern safety practices. It will also explore the cultural, leadership, and behavioral factors that mediate the effectiveness of these practices in real-world settings, with a special focus on the Saudi industrial context, particularly in Yanbu Industrial City.

## **Literature Review**

The correlation between occupational health and safety (OHS) practices and the quality of the work environment has always been of essential concern in industrial-type enterprises, in high-hazard environments, specifically, an oil and gas refinery. Employees in these environments continuously experience the risk factors of unsafe chemical handling, working at high temperatures, large equipment and operating processes that pose a risk not only to the personal safety but also to the operational integrity of the whole facility. In this research, implementation and challenges of occupational health and safety practices can be claimed to be an independent variable and include safety protocols, systems of risk management, training programs, compliance mechanisms, and the organizational safety culture. The dependent variable in its turn is improvement of working condition which is expressed in terms of employee well-being, satisfaction, performance, psychosocial comfort, and physical working environment. As it is evinced in the literature, there is a complex relationship between the two variables in that the relationship between these two variables vary depending on the context and on various external and internal factors.

Various kinds of literature have expanded on the nature and scope of OHS practices particularly in oil and gas industry. Kelechi and Faith (2023) critically analyzed the health, safety, and environmental risk management and identified the industry specific risks of noncompliance given to the regulations, poor emergency preparedness, and inability to consider environmental risks in the safety systems during oil and gas operations. Notwithstanding the fact that the industry has already established some advances in the standardization of safety worldwide, their research indicates that the practice of the real implementation remains highly fragmented in terms of accountability, and under-reporting of the near-misses. On the same note, Bo Bo Oo (2022), in the research conducted at Denko petrol stations, discovered that the most effective practices OHS are those that are embedded within the institutional safety culture instead of being separate policies. The research also highlights the role of leadership interest, constant training and participation of workers in safety promotion, which ultimately yields to better working motivation and morale among the employees. Oo's work further confirms that frontline workers are more likely to comply with safety protocols when they perceive management as genuinely committed to their well-being.

In a study work by Anbessie (2019) focusing on occupational safety and health management of the Chemical Industry Corporation in Ethiopia, his research results indicated that the

organisation has systemic weaknesses that are typical of most developing economies. According to the results, safety outcomes were sorely compromised by the lack formal OHS structures, adequate inspection system, and an evident lack of clear responsibility between managers. Besides, the study notes that where such safety training exists, it is usually outdated, academic and does not incorporate the dangers peculiar to individual plants. The insights are consistent with the general discussion that associates performance of OHS practices with the level of commitments to institutions and local adaptations. This is especially applicable in the area like the Yanbu, where the local policies have to comply with international norms, but also have to take into consideration the specifics of Saudi industrial environment.

On a different level outside the operations, the question on strategic incorporation of safety in organizational operations has been dealt with by scholars. Nwankwo (2020) also proposed a combined approach by creating a new model that combines process safety and climate change adaptation in the oil and gas sector; the author explained that process safety and climate change adaptation planning are not always sufficient because of the absence of long-term risk foresight. He points out that it is common in organizations to embrace short term adherence to safety measures but their systems are not flexible and resilient to general environmental and organizational processes. It is an indication that sustainability of OHS cannot be a minor compliance measure that is added to a company as an extrinsic objective since it is central to an organization strategic goals.

There are also other aspects through which the dependent variable of improvement of the work environment has been investigated. Naji et al. (2022) examined the psychosocial risks of the oil and gas sector and emphasized how inefficient communication within the organization, unsuccessful leadership, and unfavorable working environments become a source of stress, burnout, and mental exhaustion among workers. Their results present a strong argument in favor of a comprehensive view on the safety in a place of work that should address not only the physical safety but also maintain a psychological support. They arrive at the conclusion that the work on a better working environment should be directed towards the improvement of communication patterns, the load balance, the empathy of leadership of working individuals, the emotional safety, particularly, at the environment characterized by high pressure such as refineries.

The other main working environment is the design of the physical and an organizational working environment. When studying the issue of sustainability in Yanbu industrial city, Qaisaran and Al-Qurashi (2012) described a situation when the element of the environment, including water consumption, waste management, and overall infrastructure planning, plays a significant role in influencing the quality of industrial life. They may be more biased towards environmental sustainability in the context of their work, but they are important to look at in terms of generalizing the outside and inside factors influencing each other. An industrial city which is clean and well planned has high probability of promoting organizations that value safety and well-being leading to a vicious circle of health and productivity.

Ajmal et al. (2022) explored the links between occupational accidents and safety management practice. The researchers discovered that the compliance of employees with safety procedures is greatly mediating the occurrence of accidents, and that this is influenced by the clarity of operational processes, the rate at which the training on these procedures is conducted and on perceived fairness of methods of enforcement. Their studies validate the fact that compliance does not only represent the effect of having a presence of a policy, but a consequence of active, engaged and informed employees. This association further highlights the fact that, although safety practices may result into improvements in the work environment being automatic by-products, they are contingent on the efficiency of the given practices and quality levels of the employee involvement.

Knowledge and attitude as determinants of safety outcomes were examined in a large study conducted by Quaigrain et al. (2022) with oil and gas employees in Ghana. The paper is an original experiment that proves that the knowledge of OHS standards and the attitudinal disposition of employees towards safety have a direct influence on their behaviours of complying with them. Those who still had no basic knowledge about hazards or considered safety measures useless were much more likely to break the procedure endangering themselves and others. Such results indicate the need to have sustained safety education campaigns by which the education must be accessible to the people and also culturally acceptable by the people, particularly in cultures that are multicultural as in the case of Yanbu.

Regarding the regulatory results, Acheampong and Kemp (2022) discussed health, safety, and environmental controls in the sector of offshore oil and gas located in the UK. In their longitudinal examination printed out a trend of positive attitude towards safety performance

because of enhanced regulatory oversight, creation of privacy safety bodies and open reporting mechanisms. Nevertheless, they are also advising that regulation itself is not enough unless there is an internal organization change. This encompasses transition to proactive instead of reactive safety measures, growing funds devoted into stopping the hazards and increasing safety ownership culture across each echelon of the labor pool.

The use of digital systems to handle safety has not been left behind as far as the scholarly attention is concerned. AlMarri et al. (2025) examined how the enterprise resource planning (ERP) systems can be used to achieve improved health, safety, and environment (HSE) management. Digital solutions were proven to help real-time tracking of data, the automation of safety audits, and communication between departments, according to their study. They, however, indicated user adoption, training and accuracy of data, and thus implied that the technology should be supplemented with human capacity-building activities. According to their research, although technology has the potential of improving the safety practices, its efficiency is subject to the organization preparedness and employee competencies.

A synthesis of the above literature is that there is a multi-faceted examination of the connection between OHS practices and the enhancement of the work environment. On the one hand, successful OHS practices, which are defined by the guidance-oriented leadership style, well-guided procedures, continuous educational activities, and the incorporation of the culture, act as catalysts in the construction of safe, healthy, and supportive working environment. Conversely, weak enforcement, employee reluctance to buy into the practices, inefficiency of existing systems, and shortages in resources are some of the hurdles that prevent the extent of positive influence that the practices can make. Another important information provided in the literature is that employee opinion is a mediating factor; the employee who feels safe and supported has higher chances to make a positive contribution to the workplace climate, whilst the one who feels neglected or unsafe is likely to disengage, which results in negative consequences.

To conclude, the currently available research body has rather strong grounds to state that occupational health and safety activities well organized and adjusted to the organizational and cultural environment may have a considerable improvement effect on the quality of the work environment in the oil and gas environments. Nevertheless, the mentioned arrangements only become advantageous in case the implementation opportunities are overcome, the engagement of people is addressed, and the safety will be associated with the

overall organizational values and strategies. Yanbu is an industrial city with its strategic role and concentration of oil refining companies, and therefore, there is perfect ground to conduct empirical research that relates international best practices to local conditions. This study will contribute to an existing body of the literature in the sense that it shall expand on the available research material by giving a refined study on how safety practices and issues affect the working environment in Yanbu, which are academically sound and practically relevant.

### **Commentary on Previous Studies and Research Gap**

The literature reviewed has given a clear picture of occupational health and safety (OHS) practices and ways in which they can affect the work places of different situations especially in the oil and gas industry. All these studies are helpful in providing explanation, on technical, organizational, and behavioral aspects of safety management. As a case in point, Kelechi and Faith (2023) have pointed out the intricacy of inclusive application of risk management structure within oil and gas activities, whereas Bo Bo Oo (2022) has noted the impact of OHS on the formation of employee motivation and work engagement. Here other studies like Ajmal et al. (2022) or Quaigrain et al. (2022), discussed the combination of compliance, attitude, and the behavior of the organization in composite shaping the safety outcomes and operating employee behavior.

Also, studies by Naji et al. (2022) and Acheampong and Kemp (2022) highlight the importance of more significant psychosocial and regulatory factors that influence the OHS effectiveness, whereas AlMarri et al. (2025) presented the recent value of digital platforms in managing health and safety data. The combination of these works provides a strong basis of knowledge as to how OHS can be conducted in a manner that will improve the workplace results. Nonetheless, a majority of the researches are either hypothetical or on other located areas other than the Saudi region. In addition, most of them are focussed on the detail part of OH procedures like adherence to safety, training, or regulation rather than looking at it as a whole and having a situation-oriented analysis that would have a direct connection to enhanced workplace by means of OH practices and issues.

The obvious weakness in most of the available literature is the absence of a particular study on the industrial cities such as the Yanbu city which are major processing and refineries of oil as well as chemicals in Saudi Arabia. Although some research works such as that of Qaisaran and Al-Qurashi (2012) have imbibed a slight element of environmental sustainability in Yanbu, there is still a gross absence of empirical studies that explore the

working environment of such industrial set up as Yanbu, in terms of the application of occupational safety practices that are on the ground. Moreover, there is the impact of contextual problems

Therefore, in the present study, a gap in the research topic is evident as the research is concerned with the overlap between the OHS practices and work environment enhancement of oil refining organizations located in Yanbu. It aims at rendering a domestic and operational insight in regard to the strategies of implementing safety, what the challenges are to it and the impact that all of it has on the health and performance of the staff. Through empirical observation of the real-world experience, the study would highlight new perspectives that prove to be valuable to scholars and the operations of industry leaders and policymakers.

## **Theoretical framework**

### **Occupational Health and Safety (OHS)**

#### **Definitions of Occupational Health and Safety**

What are the definitions of the terms? Occupational Health and Safety (OHS) means the multidisciplinary occupation that relates to the safety, health, and welfare of the people at the workplace. It consists of policy, procedures and activities aimed at preventing work related injuries, illnesses and fatalities and to enhance healthy work environment. OHS is a combination of all of the following according to Ahmed et al. (2023), which entails identification, analysis, and remediation of workplace risks due to proactive risk management processes to safeguard employees and the asset of organizations. This principle does not merely touch on accident prevention, it also implies possible long-term effects of occupational exposures and well-being of workers (both physical and mental).

According to Yilmaz and Yildiz (2021), OHS is closely related to social sustainability, especially in such industries as oil refining and construction, whereby the safety of the employees can play a substantial role in the stability of the organization and the well-being of the society. In this view, OHS should not be viewed as a regulatory duty solely, but it is a form of a strategy that defines how human resources should be sustained and how operations should be carried out in an efficient manner.

#### **Historical Development of OHS in Industrial Sectors**

Over a period of time occupational health and safety has seen a lot of transformation starting with the primitive methods of safety in the early days of industrialization. The development of factories and industrial machines in the 19th century led to a sharp increase in occupational accidents with the first steps of the state regulating the situation at the workplace. Nevertheless, it was not until the middle of the 20 th century when systematic workplace safety emerged in the shape of structured risk assessment and regulation.

Benson et al. (2021) emphasize the fact that oil and gas industry with its high-risk activities became a target area in which advanced OHS standards were developed on the basis. The sector, with its exposure to dangerous substances, hazardous systems and volatile chemicals, required an impeccable safety procedure and total control measures of hazards. This industry led in innovations in the safety management over the decades and established standards that shaped the rest of the industrial safety as well.

The combination of technology and data analytics in modern settings overhauled the OHS management. According to Nugraha et al. (2024), the digital age brought the so-called New Safety Paradigm in which the management system was encompassed with digital monitoring, on-the-ground risk evaluation, and predictive analytics to improve the safety performance. This paradigm shift does indicate a trend towards proactive decision making and data driven occupational safety practices.

### **Importance of OHS in High-Risk Industries**

The importance of occupational health and safety cannot be overemphasized in industries that are considered to be risky like oil and gas. Such jobs naturally come with activities that expose the workers to life endangering threats. According to Saraswaty and Fadli (2024), High-level OHS policies are not only important when it comes to physical safety but also the psychological well being of employees, which directly impacts the job satisfaction, motivation, and rate of retention.

OHS is not a matter of compliance alone in the industries where even the smallest lens may influence the vast consequences. It qualifies as a risk mitigation, business continuity and reputation management strategy. According to Gorlenko and Murzin (2021), the integrated risk assessment techniques are especially critical in the oil and gas plants because of the complicated interconnection of the mechanical, chemical, and environmental risks. An all-inclusive OHS system may therefore be said to serve as a protection against all the lives, as well as organizational sustainability.

Moreover, AlNoaimi and Mazzuchi (2021) indicate that the project-based structure of the oil and gas sector requires constant risk assessment and the dynamic approach to safety management. The complexities of operations in the sector and their investment-intensiveness require a safety culture that should be integrated into the organizational ranks at all levels and OHS functions as one of the fundamental supports of strategic risk management.

### **Types of Occupational Risks in Oil and Gas Industry**

#### **Physical Risks**

Physical oil and gas industry risks can be described as hazards that may have a direct physical injury on workers in the oil and gas industry and this may be the result of environmental hazards or the workings of machinery. These comprise exposure to high pressure systems, use of extreme temperatures, heavy equipment and hazard of explosion or fire. As Benson et

al. (2021) point out, such risks are particularly common in drilling, refining, and transportation operations as failure of equipment or failure of the process might cause severe injuries or death.

Safety of physical risk also includes Ergonomic risk such as repetitive strain and heavy lifting as well as working in situations involving repeated physical demands. According to Ahmed et al. (2023), underestimating these risks may lead to chronic musculoskeletal disorders, loss of productivity, and high rates of absenteeism and, therefore, the need to develop physical risks management strategies within the framework of prevention.

### **Chemical Risks**

The issues of chemical risks are among the most serious problems of oil and gas industry because of widespread usage of dangerous chemicals. The oil-processing and refining may produce toxic chemicals, corrosive solutions, flammable compounds, and volatile organic compounds, which workers may be exposed to at different points of the process. As mentioned by Benson et al. (2021), the acute outcomes related to chemical exposures may include burns and respiratory distress, whereas such chronic outcomes as cancer or neurological disorders can also be caused by chemical exposures.

The nature of chemical risks is quite complicated as they require strict handling procedures, proper storage as well as efficient personal protective equipment (PPE). Ahmed et al. (2023) also observe that small businesses may not be able to provide advanced facilities necessary to implement complete chemical risk control, and that makes dictating working in the environment even more hazardous. Thus, effective control measures as well as strong chemical hazard evaluation are essential in the management of such risks.

### **Biological Risks**

In oil and gas industry, biological risks may not be as well-known as physical, or chemical risks, still they can be quite harmful to people. These are exposure of pathogens in the offshore areas, contamination by industrial waste, or unhealthy working conditions which might result into infections or diseases.

Nugraha et al. (2024) write that in the operation sites which are far apart, especially when in offshore rigs, the site may be devoid of any immediate medical assistance; a factor which could increase the effects brought about by biological hazards. Secondly, since the modern environment of the oil and gas sector is characterized by the globalization of its labor force,

health checks and hygienic standards should be subject to high levels of scrutiny because of the potential of communicable diseases.

### **Ergo Risks, Psychosocial Risks**

The ergonomic risks are a result of poor work design which does not take the human factor into account causing the repetitive strain injuries, Gaussian effects of posture, and cumulative trauma disorders. According to Saraswaty and Fadli, ergonomic risks are important and need to be dealt with by the workplace design and modification of tasks to ensure that workers are efficient and healthy over the long run (2024).

Psychosocial risks, on the other hand, are related to psychiatric and emotional pressures on workers because of a demanding work, heavy workloads, remote job location, lack of support mechanisms, or such other factors. According to Saraswaty and Fadli (2024), the psychological effects of working in hazardous areas are anxiety, depression, burn out, and low job satisfaction. Therefore, effective OHS regimes should be able to incorporate both ergonomic and psychosocial issues so as to protect different groups of workers in an all round way.

### **Risk Sources and Classifications**

#### **Sources of Occupational Risks in Oil Refineries**

The sources of occupational risks in oil refineries are manifold, and these could be classified into three categories, namely operational, environmental, and human factors. Improper functioning of pieces of machinery, process deviations, and failure of equipment are the kinds of operational sources. At the same time, as proposed by Gorlenko and Murzin (2021), refineries have complex mechanical systems which are subject to breakdown and failure of the same can cause dangerous and hazardous situations.

Environmental sources are the external setting that includes weather extremes, natural disasters, and hazardous emissions. According to Benson et al. (2021), refinery processes are altered to any change in the sports environment, and shock becomes exacerbated by the occurrence of environmental variations such as temperature increases or earthquakes.

It is even argued that human elements can be characterized as the key sources of occupational risks and they include judgment errors, inefficiency of training, failure to follow safety policies, and communication breakdown. As Ahmed et al. (2023) support, when there is a

lack of proper safety culture and consistent training of skills, innocent negligence might become a great danger to life, outlining the consideration of human-based forms of risk mitigation.

### **Classification of Risks by Nature and Impact**

Occupational risks in oil refineries can be classified based on their nature (the type of hazard) and impact (the potential consequence). This classification aids in prioritizing risk mitigation strategies and allocating resources effectively.

By nature, risks are commonly divided into:

- **Physical Risks** (e.g., mechanical injuries, noise, heat)
- **Chemical Risks** (e.g., toxic exposure, chemical burns)
- **Biological Risks** (e.g., infections, exposure to pathogens)
- **Ergonomic Risks** (e.g., repetitive strain, posture-related issues)
- **Psychosocial Risks** (e.g., stress, fatigue, burnout)

By impact, risks are typically categorized as:

- **Catastrophic Risks:** Incidents leading to multiple fatalities or massive operational shutdowns (e.g., explosions, large-scale chemical leaks).
- **Major Risks:** Severe injuries, significant financial losses, or environmental damage requiring immediate corrective action.
- **Moderate Risks:** Incidents causing temporary harm or disruption, manageable with standard response protocols.
- **Minor Risks:** Low-impact occurrences with negligible effect on operations or personnel but still warranting monitoring and control.

AlNoaimi and Mazzuchi (2021) state that an effective risk classification needs a well-developed risk and assessment structure and can be seen as stability and strength affecting on the possibility of occurrence and the scale of its consequences. Such a two-fold approach will make sure that even low-probability but high-impact risks will not be disregarded in the safety management process.

## Occupational Health and Safety Management Systems (OHSMS)

### **Concept and Components of OHSMS**

Occupational Health and Safety Management Systems (OHSMS) are part of an organized structure of managing workplace risks and improving safety performance by implementing a systematic work process, constant surveillance, and improvement. OHSMS structures are a combination of policies, procedures, and practices aimed at finding hazards, assessing risks, taking control measures, and building a safety culture of organizations. As noted by Stolzer et al. (2023), the main task of an OHSMS is not only to fulfill the requirements of the law but to introduce safety as one of the organizational fundamental principles, which minimizes the number of incidents and the active approach to managing risks.

An effective OHSMS usually has important elements such as leadership commitment, hazard identification, risk assessment, competence and training, operational controls, incident investigation, performance monitoring, and the mechanisms of continuous improvement. Hoeft and Trask (2022) believe that by implementing safety precautions at every phase in the lifecycle of the project, i.e., by integrating such precautions into Building Information Modeling (BIM) platforms, an organization can guarantee that risk management becomes its unavoidable process instead of one that comes at the end of an operation.

According to another fact noted by Patel et al. (2022), the existing implementation of technology in contemporary OHSMS is related to wearable technology and solutions of connected workers as the means of risk and hazard identification and real-time safety monitoring, which also enhances preventative and corrective safety efforts. The development represents one of the most important steps in the transition to the integrated safety concept according to which the digital innovation is used to facilitate the worker health and business continuity.

### **The ISO 45001 Standards and its Use**

The ISO 45001 is the globally renowned standard of occupational health and safety management systems. It offers an organized way of organizations taking care of their risks and improving organizational performance on matters concerning occupational safety in a systematic and pro-active means. As Landi et al. (2022) note, ISO 45001 focuses on the involvement of leaders, the participation of workers, and the embedding of OHS processes

within the companies into the general business strategies, thus contributing to the development of safety culture integrated with the corporate agenda.

The implementation of ISO 45001 includes the setting of effective OHS objectives, identification of risks, and risk control implementation, evaluation of performance and improvement of the same. According to Settembre-Blundo et al. (2021), organizations that commit to ISO 45001 make their corporate operations more resilient, even in periods of uncertainty, because they integrate flexibility and defined risk management methods in corporate decision-making to the organizational environment.

Nevertheless, it needs to be aligned with the realities of an organization within which it should be implemented. The success of ISO 45001, as was seen by Rehman et al. (2024) in the construction industry of Saudi Arabia, is modified by the regulatory environment, the culture of the organization and the maturity of the current risk management program. Thus, although ISO 45001 gives a universal guideline, its effective utilization is subjective to the flexibility and determination of the responsible organization.

### **Implementation Problems in Oil Refineries OHSMS**

The application of OHSMS in the oil refineries industry is special because the environment of the operational setting is characterized by complex work, processes with high risks, and regulatory pressure. The article by Pomaza-Ponomarenko et al. (2023) emphasizes the problems of oil refineries with permanently defining and determining risks since the operations remain dynamic and involve the implementation of inventive technologies. Moreover, the safety procedures may be inconsistent with the efficiency of production whereby it may be a struggle to implement the OHSMS due to the conflict of organizational interest.

Alshehri et al. (2023) also note that organizational and human factors (leadership style, communication patterns, and vicarious cultural mindsets) have a highly powerful impact on achievements of OHSMS in the hazardous sectors. Operations carried out in oil refineries are quite complex and sufficiently require the safety systems to be ingrained in the organizational processes and maintained by effective safety culture and ongoing involvement of employees.

What is more, according to discussion by Murr and Carrera (2022) concerning Saudi government organizations, developing progressive risk management practices may be

hampered by institutional logics and bureaucratic inertia. The latter translates to resistance to change, lack of adequate resources to be dedicated to safety programs, an issue experienced in oil refineries, and inadequate training—factors that collectively undermine the effectiveness of OHSMS implementation.

### Risk Management in Industrial Settings

#### **Definition and Objectives of Risk Management**

Industrial risk management describes a methodical approach in determining, evaluating, and eliminating risk that can potentially affect organizational goals, safety of human beings working and the continuity of the business. According to Landi et al., risk management is a strategic operation that makes corporate sustainability guaranteed by predicting future threats and taking proactive initiatives to reduce their magnitude (2022).

The main goals of industrial risk management are the protection of human life, the protection of property, compliance with regulatory authorities requirements, and business continuity. Settembre-Blundo et al. (2021) emphasize that even the contemporary risk management philosophies also consider the concept of sustainability and as a result of that, the ESG factors are considered in risk management approaches of a corporation in order to develop more resilience and increase the stakeholder confidence.

#### **Process and methods of Risk Assessment**

The basis of risk management is risk assessment and it is the systematical general consideration of risk hazards and the probability of occurrence, and their consequences. Pomaza-Ponomarenko et al. (2023) describe the general approach to risk assessment that includes identifying the hazards, risk analysis, risk evaluation, and choosing control measures suitable to reduce risks.

Quantitative risk assessment procedures such as quantitative risk analysis, failure mode and effect analysis (FMEA) and hazard and operability study (HAZOP) give a keen account of the risks involved in the operations. Igwaran et al. (2024) also stress that, in such industries as oil and gas, real-time observation and predictive analytics are essential in predicting the risks that may occur due to environmental factors that can impact operational activities, such as harmful algal blooms in the water bodies.

Almomani et al. (2021) also mention the increasingly important role of cybersecurity risk assessment, especially in the settings of digitalized industry environments, where cyber risks cause considerable business risks to companies. This creates the value of probing a collaborative risk assessment technique that covers both the cyber and physical sides.

### **Risk Mitigation Strategies and Control Measures**

Risk mitigation is the process of putting in place strategies and control measures that could ensure that either the occurrence chances of the risk are minimized or the effect is minimized. According to Hoeft and Trask (2022), the incorporation of risk controls at the project design level and through the means of the BIM-based platforms increases the overall safety of the operations and minimizes the future risks.

Controlling measures on risks are usually depicted in the hierarchy of control which ranks in elimination, substitution, engineering controls, administration controls, and personal protective equipment (PPE). As Patel et al. (2022) observe, administrative controls can be considerably improved through measures that are based on wearable technologies and connected-worker systems, raising the degree of awareness associated with hazards and enhancing real-time communication.

Regarding the oil refineries setting, Pomaza-Ponomarenko et al. (2023) pose a recommendation to use new risk management solutions that will help make dynamic decisions, as well as to be able to respond to developing risks as much quickly as possible. Such instruments should be supplemented with the consistent training and support of the leadership in order not to fail in the dangerous working environment of an industrial operation.

### **Risk management Reviews and Surveillance**

Review and monitoring are the important elements of the risk management cycle which makes the control measures effective in the long run and possible risks to be addressed in time. Settembre-Blundo et al. (2021) affirm that a perpetual feedback loop of the risk management system creates flexibility and resilience especially in a fluctuating or an uncertain environment.

According to Murr and Carrera (2022), institutional accountability system, which involves frequent audits, compliance studies, and performance assessments, play a critical role in ensuring that institutional practices of effective risk management are maintained across the

organization. Moreover, according to Alshehri et al. (2023), re-evaluation of the human and organizational factors must be periodically done as it enables the identification of lurking threats and guidance of specific interventions.

Oil refining involves dynamic-interdependent risks that cannot be overlooked even throughout continuous monitoring coupled with predictive maintenance systems and data analytics. Digital risk dashboarding, real-time capture of data, and automated reporting tools improve transparency and make decision-making simple and quick.

### Regulatory Frameworks and Institutional Safety Models

#### **International Safety Regulations and Guidelines**

The international safety rules give the general occupational health and safety in different industries. Examples of key frameworks are the ISO standards with ISO 45001 covering OHSMS and the International Labour Organization guidelines on occupational safety, or industry-specific regulation, as example international maritime organization regulations on offshore activities.

According to Stolzer et al. (2023), such international guidelines provide a unified perspective on safety management and ensure a worldwide scope of consistency, but also provide room to be adapted in a local context. The aspects, which they promote, are a risk-based approach, continuous improvement, and worker participation, as the main principles of effective safety management systems.

Such compliance with the international regulations, according to Rehman et al. (2024), improves the working safety and also promotes corporate image, investor trust, and market competition, particularly in oil and gas industries that are globally integrated.

#### **Saudi Arabian Regulation Environment on OHS**

In Saudi Arabia, the regulation of occupational health and safety covers a set of national labor laws, sector specific rules and regulations, and standards issued by other organizations, including the Saudi Standards, Metrology and Quality Organization (SASO) and the Ministry of Human Resources and Social Development.

According to Murr and Carrera (2022), the Saudi regulatory framework has been changing to achieve the best international practices, especially with the vision 2030, where diversification of the industry and development of the workforce is the expected area of

focus. This development incorporates enhanced mechanisms of enforcement, improved regulation as well as establishment of a safety culture in organizations.

Nevertheless, according to Rehman et al. (2024), difficulties are noted in achieving the consistent enactment of such regulations, which is usually linked to dissimilarities of organizational maturity and resources distribution, as well as determination on the part of leadership. This again reiterates the importance of on-going regulatory perfecting and institutional capacity building to aid effective OHS management in the Kingdom.

### **Role of the Royal Commission in Yanbu**

The Royal Commission for Jubail and Yanbu (RCJY) is the central concern of controlling and enhancing industrial development in major industrial cities of Saudi Arabia. The RCJY is charged with the obligation of being in control of environmental protection; safety of industries and development of infrastructures where the activities of industries are integrated with national standards and sustainability factors.

Alshehri et al. (2023) emphasize that the regulatory authority of RCJY, which operates in Yanbu, incorporates strict safety standards on industrial plants, obligatory risk tests, and third-party checks. The commission also initiates those efforts which promote collaboration between industries and regulatory bodies and establish the culture of safety and continuous improvement.

Further, Murr and Carrera (2022) point out to the effort of the RCJY to engage institutional support facilitating training programs and instating community safety programs. This holistic practice makes the RCJY such an essential facilitator in occupational health and safety not only in relation to the success of industries in Yanbu but also in the welfare of the society.

### **Organizational Climate and Safety Culture**

#### **Safety Culture concept**

Safety culture is made up of the commonality of values, beliefs, perceptions and behavior which define the devotion to health and safety management in an organization. It represents the safety as a priority, its communication and inclusion into the daily practices. As it has been stressed by Stolzer et al. (2023), safety culture should not be construed as a mere set of rules and regulations but rather as a shared organizational mindset and attitudes to safety at any organizational level. In high-risk industries, such as in the oil and gas industry, safe

culture is extremely important since the slightest neglect may result in the most dramatic outcomes.

Hoeft and Trask (2022) state that an active safety culture can be established by implementing safety factors in the design process and business operations. It is a method that makes safety not a responsive either, but a core component of corporate strategies. On the same note, Alshehri et al. (2023) mentions that positive safety culture stimulates compliance, encourages hazards reporting, and lowers the risk behaviors among employees which add to the overall resilient operation.

### **Safety Climate and Its Impact on Work Environment**

Safety climate Unlike safety culture, safety climate is a view by the employees about the policies, procedures and practices on safety at a certain specific time of the organization. Culture is very profound but climate is more instantaneous and transformable according to what the leaders do and what are the organizational events. Saraswaty and Fadli (2024) emphasize that a favorable safety climate which implies that workers feel the sincere interest of the management in their well-being results in better job satisfaction, increased morale, and workplace accidents.

Safety climate is not only about avoiding accidents; rather, it also shapes the psychology of the working environment and thus level of stresses as well as general performance. The issue of transparent communication and obvious commitment to leadership are critical to creating a positive climate of safety, especially in the industry with advanced safety technologies (Nugraha et al., 2024). Thus, a good safety climate makes a strategic element in improving both performance and safety among businesses.

### **Leadership in the Development of Safety Culture**

It is important that leadership determines and maintains an effective safety culture. Leaders dictate the safety priorities, demonstrate the desired behaviors and develop the environment where safety becomes a communal issue. According to Stolzer et al. (2023), transformational leadership (which is known to be inspirational, communicating, and supportive) fosters proactive safety involvement among employees.

Settembre-Blundo et al. (2021) emphasize that resilient leadership may mobilize a desire to focus or create an organizational commitment to safety during an uncertain period, further outlining the ability to be adaptable when changing the way safety is practiced so that

standards are not jeopardized. In addition, Alshehri et al. (2023) confirm that the direct engagement of leadership in the safety initiatives such as training and open communication establishes the feeling of trust as well as allows employees to be involved in the safety management procedures, which further institutionalizes safety at the organizational level.

### Theories Related to Occupational Health and Safety

#### **Systems Theory in Safety Management**

The systems theory of safety management reckons that organizations are systems, in that, individual elements in the large system interact to determine the safety performance of the organization as a whole. According to Stolzer et al. (2023), the definition of safety as the system should imply identifying the interactions between the factors and organizational frameworks, technology, and environmental statuses.

This theory emphasizes the significance of systemic thinking in isolating the causes of safety even to the root and not blaming the cause on individual failure. According to Pomaza-Ponomarenko et al. (2023), the specific characteristics of organizations and interdependencies of the processes have to be attributed to risk identification and management, which means that integrated safety management systems that can adapt to complex industrial situations have to be created.

#### **Safety compliance and Theory of Planned Behavior (TPB)**

The Theory of Planned Behavior (TPB) describes explanations that the behavior of an individual is shaped by attitudes, subjective norms, and perceived control of behavior. With regard to occupational safety, TPB posits that the readiness of both workers to follow through with safety guidelines will depend on the belief by the workers about their safety, expectations by fellow employees and confidence in their fitness following the safety guidelines.

Saraswaty and Fadli (2024) used this theory to explain that employees, who see safety practices as helpful and supported by their colleagues and headmaster/teachers, stand higher likelihood of obedience. Supportively, Ahmed et al. (2023) also confirm the findings that good attitude toward and awareness of safety, as well as training and support in increasing the perceived behavioral control can greatly contribute to enhancing compliance and thereby decreasing risk behaviors amid hazardous working conditions.

Depending upon the work Situation and Environment, Work Environment and Job Demands-Resources (JD-R) Model.

**The Job Demands-Resources (JD-R) model** describes the interaction of job demands (e.g., workload, time pressure, hazards) with job resources (e.g. support, feedback, safety measures) in affecting both the well-being and performance of the employee. According to Saraswaty and Fadli (2024), demanding job with scanty resources promotes stress and burnout but sufficient resources neutralize the effect of challenging work life conditions.

In the oil and gas industry, Nugraha et al. (2024) argue that safety measures act as critical job resources that alleviate the psychological and physical strains of high-risk operations. Therefore, applying the JD-R model in occupational safety highlights the need for balanced job design and adequate support systems to enhance worker engagement, safety compliance, and overall job satisfaction.

### Challenges in Implementing OHS Practices in Oil Refineries

#### **Technical and Operational Challenges**

The issue of undertaking OHS in oil refineries is one that simmers through technical and operative complexities. New safety systems are always faced with challenges in incorporating them with the existing operational workflow because of compatibility, or interference of the processes. According to Pomaza-Ponomarenko et al. (2023), the nature of the refinery activities needs adaptable systems of safety that can change with the changes in technology.

Additionally, as Benson et al. (2021) point out, the very complexity of machines, dangerous chemicals, and conditions that require high pressure which is a feature of oil refining would require specialized risk management and constant technical supervision, and the adoption of general safety precautions would cost a lot of resources to implement.

#### **Human Factor and Barriers to Behavior**

Human factors are a very important obstacle in enforcement of OHS. This is the case of resistance to change, complacency, and failure to follow safety considerations. Alshehri et al. (2023) stress that the employee behavior related to safety is significantly determined by his or her organizational culture, leadership commitment and communication practices.

According to Ahmed et al. (2023), the absence of training and engagement leads to low efficacy of safety interventions. In high-risk situations where behavioral barriers may be strong due to overconfidence, normalization of deviance or risk habituation and therefore unsafe practices become the rule, behavioral barriers are a feature of a high-risk environment. The most essential solution to these barriers is to have a holistic approach including education, modeling by leaders and mechanisms of reinforcement.

### **Resource and Finance limitations**

Lack of funds is a very common thing that impedes full scale implementation of the OHS programs. According to AlNoaimi and Mazzuchi (2021), the budget limits might translate to underinvestment in safety equipment, associated training, and other systems upgrade and undermine the overall safety outcomes.

According to Rehman et al. (2024), economic pressures may tend to worsen the resource limitation in the Saudi environment, especially in the small businesses or during economic hardships. Such budget constraints require the introduction of low cost safety concepts as well as focusing on key risk areas so that safety projects can be useful even when organizationally faced with tight budgets.

## **Occupational Health and Safety and Its Impact on Work Environment**

### **Impact on Physical Work Environment**

Physical work environment is directly dependent on occupational health and safety practices as they determine the safety plans, countermeasures and ergonomic solutions. Hoeft and Trask (2022) focus on the idea that the consideration of safety in the designing stage of facilities and flows makes physical security and operational risks decrease.

According to Patel et al. (2022), innovative safety management implies the deployment of smart technologies and automation, which enhances monitoring and control of hazards in the workplace and, in consequence, leads to safer and more efficient working environments. Good OHS practice can therefore not only stop accidents happening but will also make the best use of space and work routines on industrial sites.

### **Effect on Employee Well-being and Employee Satisfaction**

OHS is not just related to physical safety as it counts on the well being of employees, work satisfaction, and commitment to the organization. Saraswaty and Fadli (2024) emphasize that

a positive working safety environment decreases the amount of stress in the workplace and increases mental health rate and makes a worker feel secure at the workplace.

According to Settembre-Blundo et al. (2021), organizations with a strong focus on safety usually have increased turnover rates and fewer turnover rates. The combination of a positive safety culture induced by the leadership and participatory practices encourages building the environment, in which the employees consider that they are valued and motivated, which leads to their general contentment at the workplace, including its loyalty.

#### **The relationship Mutual relationship with Organizational Performance<sup>4</sup>**

Occupational health and safety is multifaceted in that it relates to the organizational performance. Good OHS practice can lead to efficiency in operations with minimum interference due to accidental damage, less absenteeism and high productivity. According to Landi et al. (2022), corporate resilience and stakeholder trust are also enhanced by the inclusion of safety in risk management structures.

In addition to this, the adherence to safety laws and the active control of the occupational risks help the companies improve their reputation and competitiveness, particularly in those industries, where the customers and regulators pay close attention to the performance in the matter of safety (Rehman et al., 2024). Finally, a strong OHS system will not only safeguard employees, but it will assist in ensuring sustainable organizational development and performance.

## **Research Model**

### **- Occupational Health and Safety Practices (OHS Practices)**

- **Type:** Independent Variable
- **Description:** Implementation of safety measures, policies, procedures, and management systems within oil refining companies to ensure workers' safety and prevent occupational hazards.

### **- Challenges of OHS Implementation**

- **Type:** Moderating Variable
- **Description:** Technical, operational, financial, and human factors that may hinder or facilitate the effective implementation of OHS practices.

### **- Work Environment Quality**

- **Type:** Dependent Variable
- **Description:** Physical and psychosocial conditions of the workplace, including safety climate, employee well-being, job satisfaction, and overall working conditions.

### **- Leadership Commitment**

- **Type:** Intervening Variable
- **Description:** Active engagement and support of management in promoting a safety culture, providing resources, and fostering employee participation in safety practices.

## CHAPTER 3

## **Introduction**

This chapter presents the methodology adopted to examine the impact of occupational health and safety practices and their challenges on the work environment in oil refining companies in Yanbu. It outlines the research design, population, sample, data collection methods, and analytical tools used to ensure accurate and reliable study findings.

## **Methodology and Research Methods**

The research method applied in the study is descriptive-analytical researches, and this type of research is suitable in studying the nature, trends and association between the occupational health and safety (OHS) practices and their roles in the improvement of the working environment. The descriptive part of the work aims at defining the existing pattern of the OHS practices of the oil refining firms operating in Yanbu region, and the analytical aspect will attempt to interpret the extent to which the practice of adopting techniques, and countering issues related to implementation lead to a difference in the work environment underpinning the objectives.

The use of descriptive-analytical research is prevalent in organizational studies where one aims to generate a deeper-structured insight of a complex problem in a particular situation. In the study, the approach allows conducting a detailed review of the views of the employees related to the availability and appropriateness of safety measures, the level of employee participation and whether practices had an impact on the situations at the workplace.

The research can be placed as a quantitative research initiative with cross-sectional survey as the main research tool designed to collect data. The selected method in the form of a questionnaire enables systematic and standard data gathering of a wide range of participants to assure the quantifiability of responses, the ability to compare it and finally analysis using statistics.

### **Data Collection Tool**

To collect the necessary data, a structured questionnaire was developed and distributed among the 50 selected participants. The questionnaire was designed in English and divided into three major sections, with a total of 20 questions that cover the key variables of the study.

- **Section 1: Demographic Information (3 Questions)**

This section gathers basic background data to help classify responses and identify possible trends across different demographic categories. Questions include:

- Gender (Male / Female)
- Position in the company (e.g., technician, supervisor, safety officer, etc.)
- Years of experience in the oil and gas sector

- **Section 2: Main Survey Items (15 Questions using Five-Point Likert Scale)**

This section includes the core items of the study and is based on a five-point Likert scale ranging from (1 = Strongly Disagree to 5 = Strongly Agree). The items are designed to measure:

- Perceptions of current OHS practices
- Perceived effectiveness of safety training and communication
- Leadership commitment to safety
- Challenges and obstacles to implementing OHS practices
- Impact of OHS on the quality of the work environment (e.g., physical safety, psychological comfort, motivation, and job satisfaction)

- **Section 3: Open-Ended Questions (2 Questions)**

## **Population and Sampling**

### **Population and sampling of studies**

The study sample will consist of employees of companies which produce oil refineries in Yanbu Industrial City in Saudi Arabia. These businesses are an inherent component of the national industrial sector that feature complicated operational setting and high safety standards. The target population consists of representatives of different levels of organization who are directly or indirectly involved in the work of occupational health and safety systems, not to mention safety officers, operations employees, supervisors, and ordinary workers.

As this study is large and exploratory, purposive sampling technique was used. They were sampled according to the topic of study that is; whether they were a subject expert on the subject or whether they were involved with the OHS practices at their place of work. With this non-probability sampling technique, one will be able to collect information only by the individuals that are most probable to have something important to say about the process and outcome of safety measures.

The last sample will be obtained by a total number of 50 study participants who represent various departments of oil refineries in Yanbu. A sample size with this size is suitable to conduct a small scale exploratory study as it still has some depth in measuring the data interpretation and is also manageable in terms of the survey process and data analysis procedures.

## **Limitations of the Study**

### **1. Spatial Delimitation:**

This study is limited to **oil refining companies located in Yanbu Industrial City**, Saudi Arabia. Yanbu represents one of the most important industrial zones in the Kingdom, hosting major oil refining facilities, which makes it a relevant and strategic setting for examining occupational health and safety (OHS) practices and their impact on the work environment.

### **2. Temporal Delimitation:**

The research was conducted during the **year 2025**, specifically between **June and September**, during which the questionnaire was distributed, responses were collected, and data analysis was completed.

### **3. Human Delimitation:**

The study sample is restricted to **50 employees** working in Yanbu-based oil refining companies. Participants include individuals who have either direct or indirect involvement with occupational safety procedures, such as technicians, safety officers, supervisors, operations staff, and other relevant personnel.

### **4. Thematic Delimitation:**

The scope of this research is focused exclusively on examining the **impact of occupational health and safety practices and their associated challenges on the improvement of the work environment**. It does not address other related topics such as public health or environmental protection. Additionally, the study is concerned only with **internal workplace conditions** and does not extend to external influences such as national policy or macroeconomic factors.

# CHAPTER 4

## **Introduction**

The aim of this chapter is to reveal the results of the collected data analysis and to discover the influence of occupational health and safety (OHS) practices and the problems connected with their implementation on the working environment of oil refining companies in Yanbu. The overall aim of the chapter is to explore the connections between the variables of the study, i.e., the OHS practices, implementation issues, leadership dedication, and the quality of the working place, basing on the responses obtained in the sample of the study.

Analysis procedure starts with a descriptive statistical analysis of the sample characteristics and proceeds with the evaluation of the main variables with the help of corresponding statistics. These will include frequency tables, means and standard deviations describing the data and inferential statistical techniques of correlation analysis and a regression model used to test the hypotheses of the study.

Moreover, the stability of the measurement instrument was determined by rooting Cronbachs Alpha coefficient that was at 0.975 which translated to a very high level of internal consistency levels of the items on the questionnaire. This Cyclone liability coefficient proves the adequacy of the tool in the complex of the measured constructs and makes analysis more convincing, which follows.

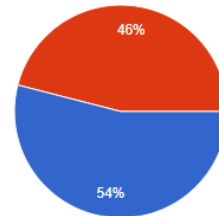
All the results of validity tests to prove the validity of the data and measuring tools are also provided in the chapter. The findings are elaborated on the aims of the research, and they offer clues to the extent that OHS practices have impact on the employment environment and how different challenges are able to regulate the interaction. The results presented in this chapter form the foundation of the discussion and conclusion sections following it, which allow establishing the connection between the empirical data and the theoretical basis of the research.

## Data Analysis

### Section One Demographic Data

#### Gender:

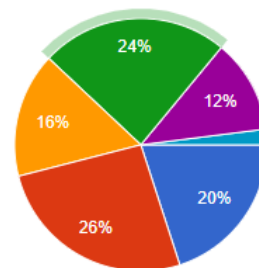
- Male:27 response
- Female:23 response



*Figure 1 Gender*

#### Position in the company:

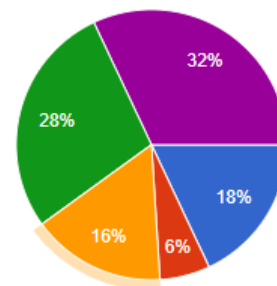
- Technician:10 responses
- Supervisor:13 responses
- Safety Officer:8 responses
- Operations Staff: 12responses
- Administrative Staff: 6responses
- Marine Advisor:1 response



*Figure 2 Job Title*

#### Years of experience

- Less than 1 year:9 responses
- 1 to 3 years: 3 responses
- 4 to 6 years: 8 responses
- 7 to 10 years: 14 responses
- Over 10 years: 16 responses



*Figure 3 Years of experience*

## **Commentary on the Demographic Analysis**

The demographic characteristics of the participants of the study are important information on the nature of the workforce that is engaged in oil refining activity in Yanbu, which helps to explain the key results of this study. The process of demographic analysis is a crucial process in learning about the back-ground of the respondents since it can develop the diversity, the degree of experience as also the role that they play in the organization who may direct perceptions of occupational health and safety (OHS) into practices and working environment.

### **Gender Distribution**

The gender breakdown of the respondents reveals quite an equal proportion with: 27 male participants (54%) and 23 female participants (46%). Such statistical evenness is remarkable in the light of the oil refining business, which is an area that has intentionally been run by male employees since in its area of operation their profession is quite technical and requires a lot of operational skills. The presence of females in large amounts might be an indicator of change in the employment pattern of the industry in Yanbu, which might mean an increasing inclusion and diversification of the workforce.

Gender diversity can also potentially impact organizational views on safety culture and working environment since past research estimated that gender could impact safety compliance views and communication in the context of industry (Yilmaz & Yildiz, 2021). In addition, inclusion of both gender views would enhance the information provided, and give a better series of details on the perceptions and the implementation of the OHS practices among various categories of employees.

### **The Organization Job Positions**

The jobs of the respondents in the organization are diversified and indicate broad cross-section of jobs necessary in running of refineries. The most represented categories were the supervisors (which obtained 13 responses) and operations staff (which obtained 12 responses) and they make up exactly 50% of the total number of respondents. The two categories are essential to the analysis because in most cases, supervisors directly influence the implementation of safety regulations, and the operations staff is in the frontline, where most occupational hazards occur.

There is also a large percentage of technicians (10 responses) as well as safety officers (8 responses). Technicians also normally get to interact with instruments and their calibration, a subject on which they require a close attention towards OHS measures. Instead, safety officers bear direct responsibility in the monitoring of compliance and implementation of safety measure. Their contribution can give insight to the field of the difficulty of implementing OHS standards showing a practical application.

Other slightly less field related positions are administrative staff (6 responses) and the marine advisor (1 response). The fact that these professions have been incorporated implies that the views of people representing various organizational levels have been looked into, which increases the scope of the analysis. The varieties of job titles indicate that the data covers all the possible views on the effects of OHS practices on various aspects of the workplace environment both on the frontline as well as on the administrative levels.

### **Experience**

Experience level of individuals is to be considered a very essential factor that drives their views and feeling towards occupational health and safety. Based on the analysis, it is observed that there is a wide spread in the category of experience. Respondents that have more than 10 years of experience (16 responses, 32%) are the largest group and those that have the experience of 7 to 10 years (14 responses, 28%) are second in a row. Collectively, these two categories make up 60 percent of the overall sample, and it implies that there is a workforce that has a huge amount of professional experience.

The older work extraordinary employees are not just likely to understand operational risks to a great extent, safety practices, and organizational culture. Their experiences make them add substance to a mature view of effectiveness of OHS systems and practical issues in the application of these systems. Moreover, the high turnover may indicate that the oil refining business in Yanbu is stable and the company needs to retain skilled employees to enable the business to run.

At the opposite end of the scale, 9 respondents (18%) said that they do not have more than 1 year of the experience, and 3 respondents (6%) have 1 to 3 years of experience. Such incorporation of newer workers becomes important, because the views of the workers may reveal onboarding procedures, initial safety education efficiency, and first impression of the organizational safety climate. To understand the level at which the newly employed respond

to OHS practices is crucial in assessing the ability of an organization to ensure that their employees imbibe the culture of safety since they join work.

The 4 to 6 years of experience group (8 answers, 16%) is considered the mid-career professionals and might have an operational familiarity and flexibility towards new rules of safety. Their perception provides an intermediary outlook in terms of entry-level workers and extremely experienced employees and the areas of possible strength and vulnerabilities in the current practice of safety.

All in all, demographic analysis shows a well balanced sample with a variety to offer in terms of gender, job role, and professional experience. This will help increase the validity of the study as the data will represent the varying opinions in the organization. Between both genders, as well as incorporation of operation and administrative services, and the range in experience levels indicates that a comprehensive image of the occupational health and safety dynamics of the oil refining industry of Yanbu will be described in the findings.

The structure of the demographics also indicates the need to consider customized OHS interventions that should accommodate the specific needs and interests of different groups of employees. Focusing on the gender-sensitive training, role-specific safety procedures, or experience-based mentoring programs, it is important to note that demographic diversity is one of the primary factors that should be taken into account to create a resilient and effective safety culture.

Such an extensive demographic background has given an excellent foundation to analyzing the findings of the research and having an insight to a greater meaning of the OHS practices and work environment enhancement in the industrial background of Yanbu.

## Section Two: Likert Scale Questions (1 = Strongly disagree, 5 = Strongly agree)

### 1. Descriptive Statistics (Mean, Median, Standard Deviation).

*Table 1 Descriptive Statistics (Mean, Median, Standard Deviation)*

| Statement                                                                          | Mean | Median | Standard Deviation |
|------------------------------------------------------------------------------------|------|--------|--------------------|
| The company has clear and well-communicated OHS policies                           | 3.92 | 4.00   | 1.31               |
| Safety procedures are regularly reviewed and updated                               | 3.92 | 4.00   | 1.24               |
| I receive regular training related to workplace safety                             | 3.94 | 4.00   | 1.25               |
| Safety drills and emergency procedures are well organized                          | 3.74 | 4.00   | 1.31               |
| Safety communication between management and employees is effective                 | 3.92 | 4.00   | 1.34               |
| Supervisors and leaders actively promote a safety culture                          | 3.96 | 4.00   | 1.32               |
| Management demonstrates a strong commitment to safety practices                    | 4.08 | 5.00   | 1.28               |
| There are sufficient resources available to implement safety practices effectively | 4.00 | 4.00   | 1.21               |
| Safety concerns raised by employees are taken seriously                            | 3.98 | 4.00   | 1.27               |
| I feel physically safe while performing my duties                                  | 3.94 | 4.00   | 1.17               |
| The safety measures contribute to my psychological comfort at work                 | 4.10 | 5.00   | 1.22               |

|                                                                                    |      |      |      |
|------------------------------------------------------------------------------------|------|------|------|
| OHS practices motivate me to perform better in my job                              | 4.12 | 4.00 | 1.12 |
| I am satisfied with the company's approach to workplace safety                     | 4.02 | 4.00 | 1.15 |
| Implementing OHS practices faces obstacles (e.g., budget, resistance, bureaucracy) | 3.94 | 4.00 | 1.15 |

The descriptive statistical analysis of the obtained data will give necessary information on the perception of employees about occupational health and safety practices within their organizations or rather within the setting of oil refining companies within Yanbu. When the use of measures of central tendency and dispersion, like the population mean, median, standard deviation, are considered, one can get a complete picture of how the respondents feel in respect to many areas of safety management, communication, leadership dedication, source availability, and the mental effect of the occupational health and safety programs in their daily work life.

The first one that touches upon the clarity of OHS policies and the way they are communicated in the company produced the mean of 3.92 and the median of 4.00 with the standard deviation of 1.31. This implies that the respondents in the company consider the safety policies of the company to be well communicated and easily understood by employees with the standard deviation pointing to some deviation of the responses. This flexibility could be caused by difference in effectiveness of communication in various departments or diversity in management practices. Although a large number of respondents would probably concur with the clarity of policies, some might have faced incoherence or lack of cohesion with regard to the way these policies are communicated and implemented in various levels of the organization.

Question about the periodic review and update of safety procedures showed a mean of 3.92, median of 4.00 with the standard deviation of 1.24. These numbers align with the first point which shows that there is a rather positive attitude toward procedural changes. Nevertheless, the fact that the standard deviation is slightly lower, could mean that the employees experience is more homogenous as far as periodic revision of safety measures are concerned. This consistency indicates the presence of an organizational process of achieving consistency in the scope of reviewing safety practices, indicating a more defined process of dealing with

safety, which correlates with the international requirements of safety management and risk management practices.

Discussing the issue of regular safety trainings delivery, one may note that the resulting mean was 3.94, one may note that the resulting mean was 3.94, the median was 4.00, and the standard deviation was 1.25. The stability of the median of 4.00 in numerous items seems to give the idea of quite constant perception among the largest part of employees about the safety of the training on the topic the company gives. However, the prevalence of the diverse experiences is reflected in the standard deviation which may be correlated with the differences in the frequencies of trainings, their topical relevance, or departmental orientation. Employees could have enjoyed in-depth training programs on regular basis and another could have faced fewer and generalized type of training programs.

Evaluation of the effectiveness of the safety drills and an emergency procedure was realized; a mean of 3.74 and a median of 4.00 were received, but the standard deviation was higher at 1.31 as opposed to the earlier responses. This is an indication that although drills and emergency response have been viewed as positive by many employees, there are quite serious variations as to how these drills are used by different parts of the company. The higher variability may indicate that there are inconsistencies in how frequently the drills are conducted, how effectively they are coordinated, or communicated during the emergency situation and it represents the potential avenue to create a standard practice of emergency preparedness in the organization.

The average of safety communication between the employees and the management was equalled to 3.92, with a median of 4.00 and the standard deviation was 1.34. The relatively large standard deviation also implies that the scores on how well the effective safety communication is perceived by the employees shows significant variations indicating that an improvement in this area is necessary. This may be shaped by management practices, hierarchy in a department, or also cultural element in a team. One of the cornerstones of safety culture has been established to be the effective communication, and the gaps in this aspect may influence the engagement and compliance of employees with the safety practices which is why it is critical to contribute to a free and transparent dialogue within the company.

When it comes to the encouragement of safety culture by supervisors and leaders, the sample was at the mean of 3.96, median of 4.00 and a standard deviation of 1.32. This brings about

an overall positive perspective towards the role of leadership in encouraging safety but, as is the case with the rest of the items, the variability of response suggests different leadership effectiveness. The strength of safety culture strongly depends on the leadership behavior, and inconsistency in the promotion activity can indicate the necessity of a more systematic approach to the leadership development and the mechanisms of accountability in the management paradigm of the corporation.

One of the highest mean values was that attached to the question which demanded to know the commitment of the management to safety practices with the mean value of 4.08, median of 5.00 and a standard deviation of 1.28. The median of 5.00 implies that a substantial appraisal of the respondents is highly in agreement to the statement, which is a high rating of perceived commitment by the top-level management. However, in spite of these, the fact that the standard deviation exceeds 1.00 shows that although most employees have realized that there is good management commitment, some could have detected some holes or deviations. Such difference can be associated with the varying levels of management visibility, resources distribution, or being personally involved in safety activities in this or that level of the operations.

The sufficiency of resources to effectively introduce safety practices registered a mean of 4.00, median of 4.00 and a standard deviation of 1.21. This information suggests that the majority of employees believe that there are sufficient resources on safety provision, i.e., equipment, staff, and financial help in their company. But like other things, the variance implies that resources are not evenly availed and this may depend on the projects to be done or area budgets. There needs to be fair allocation of resources in order to guarantee uniformity in safety standards within the entire organization.

The employee perceptions on whether there is consideration to the safety concerns they have was averaged to 3.98, median of 4.00 and the variance was 1.27. The overall positive answer to this question shows that the employees think that their feedback is noticed and acted upon, but the range of differences in the answers shows that there are feedback gaps or a lack of response by management. Filling these gaps would improve the confidence in organizational operations and foster a more active conversation about safety between employees and the management.

With regard to physical safety about work, the average score was 3.94, the median was 4.00 and the standard deviation was 1.17. The relatively reduced standard deviation is exhibited

which implies that the experience among the employees is more homogenous which means that the majority of the personnel are physically safe exercising their responsibilities. It is an important perception which is directly proportional to confidence, productivity, and risk aversion behavior of employees at the workplace. This feeling of safety needs to be enforced constantly through a perspective that monitors and adjusts the applied safety interventions on the changing operational risks.

The psychological comfort as a result of the safety measures was acquired at the average value of 4.10, the median value of 5.00, and the standard deviation of 1.22. These statistics drive the significance of OHS not only as a prevention of physical health hazards, but also a factor that furthers mental health. The result is indicated by the high mean and median, which portrays that employees greatly believe that effective safety practice has an important role to play in their psychological security. The given outcome corresponds to the current studies that place importance upon social and psychological dimensions of workplace safety, Modify its impact on the involvement of workers, their satisfaction, and allegiance to the organization.

The mean of the motivation based on OHS practices was 4.12, median of 4.00, with a standard deviation of 1.12. This is the consistent positive review that effective safety management systems do not only ensure safety of the employees but they motivate the staff to strive more. The relatively low standard deviation suggests a shared understanding among employees of the value of safety in fostering a supportive and motivating work environment. When employees feel cared for and protected, their commitment and performance naturally improve, strengthening organizational effectiveness.

The total mean of employee satisfaction concerning the manner through which the company approaches safety in the workplace was 4.02, with a median of 4.00, using a standard deviation of 1.15. This implies that there is an overall satisfaction with the occupational safety issue management by the organization. The results showed that the safety plans developed by the company are appealing to the employees, however, like other things, there are also some inconsistencies when it comes to the experiences. The same level of satisfaction must be maintained with constant review and improvement of safety policies and programs.

Lastly, the claim referring to the issues in applying OHS exercise, such as budget limitation, resistance and bureaucratic barriers led to the average of 3.94, median of 4.00 and a standard deviation of 1.15. This credits the fact that OHS has been viewed positively although there

are practical barriers to its complete accomplishment. Such barriers can be cost-related, inability to get the organization to change, or bureaucracies that slow down the process of rolling out safety measures. Incorporating them needs strategic thinking and quality management to perform leadership, as well as streamlining of operations processes in order to make integration of safety practices in a working process smoother.

## 2. Correlation Analysis

*Table 2 Correlation Results Table*

| Variables                                                | The company has clear and well-communicated OHS policies | Safety procedures are regularly reviewed and updated | I receive regular training related to workplace safety | Safety drills and emergency procedures are well organized | Safety communication between management and employees is effective | Supervisors and leaders actively promote safety culture | Management demonstrates a strong commitment to safety practices | There are sufficient resources available to implement safety practices effectively | Safety concerns raised by employees are taken seriously | I feel physically safe while performing my duties | The safety measures contribute to my psychological better comfort at work | OHS practices motivated me to perform better in my job | I am satisfied with the company's approach to workplace safety (e.g., budget, resistance, bureaucracy) | Implementing OHS practices would positively impact overall job satisfaction |       |
|----------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------|
| The company has clear and well-communicated OHS policies | 1.000                                                    | 0.838                                                | 0.695                                                  | 0.621                                                     | 0.697                                                              | 0.847                                                   | 0.690                                                           | 0.799                                                                              | 0.762                                                   | 0.759                                             | 0.673                                                                     | 0.775                                                  | 0.761                                                                                                  | 0.662                                                                       | 0.642 |
| Safety procedures are regularly                          | 0.838                                                    | 1.000                                                | 0.758                                                  | 0.553                                                     | 0.684                                                              | 0.730                                                   | 0.700                                                           | 0.813                                                                              | 0.723                                                   | 0.742                                             | 0.653                                                                     | 0.800                                                  | 0.743                                                                                                  | 0.668                                                                       | 0.718 |

|                                                                                                  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| y<br>reviewe<br>d and<br>updated                                                                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| I receive<br>regular<br>training<br>related<br>to<br>workpla<br>ce safety                        | 0.695 | 0.758 | 1.000 | 0.639 | 0.777 | 0.688 | 0.706 | 0.793 | 0.692 | 0.807 | 0.848 | 0.763 | 0.751 | 0.720 | 0.740 |
| Safety<br>drills<br>and<br>emergen<br>cy<br>procedu<br>res are<br>well<br>organize<br>d          | 0.621 | 0.553 | 0.639 | 1.000 | 0.735 | 0.584 | 0.687 | 0.580 | 0.637 | 0.765 | 0.710 | 0.678 | 0.655 | 0.669 | 0.710 |
| Safety<br>commu<br>nication<br>between<br>manage<br>ment<br>and<br>employe<br>es is<br>effective | 0.697 | 0.684 | 0.777 | 0.735 | 1.000 | 0.643 | 0.698 | 0.717 | 0.684 | 0.768 | 0.695 | 0.743 | 0.610 | 0.700 | 0.667 |
| Supervi<br>sors and<br>leaders<br>actively<br>promote                                            | 0.847 | 0.730 | 0.688 | 0.584 | 0.643 | 1.000 | 0.788 | 0.776 | 0.764 | 0.790 | 0.674 | 0.706 | 0.777 | 0.615 | 0.603 |

|                                                                                    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| a safety culture                                                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Management demonstrates a strong commitment to safety practices                    | 0.690 | 0.700 | 0.706 | 0.687 | 0.698 | 0.788 | 1.000 | 0.832 | 0.757 | 0.812 | 0.705 | 0.780 | 0.805 | 0.657 | 0.689 |
| There are sufficient resources available to implement safety practices effectively | 0.799 | 0.813 | 0.793 | 0.580 | 0.717 | 0.776 | 0.832 | 1.000 | 0.809 | 0.822 | 0.817 | 0.828 | 0.906 | 0.805 | 0.760 |
| Safety concerns raised by employees are taken seriously                            | 0.762 | 0.723 | 0.692 | 0.637 | 0.684 | 0.764 | 0.757 | 0.809 | 1.000 | 0.853 | 0.755 | 0.807 | 0.782 | 0.642 | 0.642 |
| I feel physical                                                                    | 0.759 | 0.742 | 0.807 | 0.765 | 0.768 | 0.790 | 0.812 | 0.822 | 0.853 | 1.000 | 0.852 | 0.834 | 0.851 | 0.711 | 0.763 |

|                                                                     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ly safe while performing my duties                                  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| The safety measure s contribute to my psychological comfort at work | 0.673 | 0.653 | 0.848 | 0.710 | 0.695 | 0.674 | 0.705 | 0.817 | 0.755 | 0.852 | 1.000 | 0.831 | 0.800 | 0.807 | 0.795 |
| OHS practice s motivate me to perform better in my job              | 0.775 | 0.800 | 0.763 | 0.678 | 0.743 | 0.706 | 0.780 | 0.828 | 0.807 | 0.834 | 0.831 | 1.000 | 0.854 | 0.751 | 0.847 |
| I am satisfied with the company's approach to workplace safety      | 0.761 | 0.743 | 0.751 | 0.655 | 0.610 | 0.777 | 0.805 | 0.906 | 0.782 | 0.851 | 0.800 | 0.854 | 1.000 | 0.787 | 0.830 |
| Implementing OHS practice s faces obstacle                          | 0.662 | 0.668 | 0.720 | 0.669 | 0.700 | 0.615 | 0.657 | 0.805 | 0.642 | 0.711 | 0.807 | 0.751 | 0.787 | 1.000 | 0.869 |

|                                                                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| s (e.g., budget, resistance, bureaucracy)                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Improving safety practices would positively impact overall job satisfaction | 0.642 | 0.718 | 0.740 | 0.710 | 0.667 | 0.603 | 0.689 | 0.760 | 0.642 | 0.763 | 0.795 | 0.847 | 0.830 | 0.869 | 1.000 |

The correlation research study used in this study was to determine the level of how variable was related with one another and whether it had a direction or not in the oil refining companies in Yanbu. The statistical measure that was adopted to determine the degree of linear relationship that exists between the various variables under study was Pearson correlation coefficient. The outcomes of the correlation matrix demonstrate that there are a few significant and strong positive correlations among the items which means that there are also some interconnections between the clarity of OHS policies, leadership commitment, resource availability, and workers training and the workers feelings about OHS and job satisfaction.

The results have presented one of the most striking indications, that being the extremely strong positive relationship between the clarity and communication of OHS policies and the encouragement of a safety culture by the supervisors and the leaders at 0.847. This implies that in areas where OHS policies are seen to be clear and well explained, the supervisors are also seen to be working hard in encouraging a safety oriented climate. This could be attributed to the idea that clear organizational guidelines and communication in general have support to leadership behavior in safety issues, which helps in the popularization of the culture of safety along the hierarchical ladder.

On the same note, the high correlation value (0.837) of the presence of clear OHS policies and regular review and update of safety procedures shows that, organizations with the emphasis on clarity of policies will also be the ones with emphasis on the safety procedure being up to date. This is in reference to the fact that structured policy frameworks and practices are interdependent in the sense that understanding at the strategic level has an equivalent of orderly procedural management. It points out that safety policies cannot be stand-alone documents, which are directly interconnected with the dynamism and sensitivity of the safety procedures employed in the working environment.

Nevertheless, the interconnection between the leadership involvement and other safety aspects is high all through the matrix. The observed level of correlation between the active promotion of safety culture by supervisors and the high commitment to safety demonstrated by the management is 0.788, which indicates a close vision of the management on the safety strategy on various levels of managing their company. This shows that when top management is seen as having a vested interest in safety, then the same will filter down to the supervisor and he in turn will present the values on a day-to-day operational environment. The example of visible commitment by the leadership therefore serves as an impetus in strengthening the safety culture within the organization.

A good relationship is also found between the availability of adequate resources to actualize safety practices efficiently and the clarity of OHS policies with a measure of 0.799. This implies that visibility of policies and resources allocation is viewed as two aspects that complement each other in safety management. Employees will also tend to relate the safety policies as easy to discern and implement when they realize that their company has enough resources to devote to safety (equipment, personnel training, and staffing). This further goes to support the great importance of a concrete support in making safety policies a reality and turning them into practical, visible steps.

The information also shows the connection between normal safety training and personal safety perceptions quite proficiently. The fact that the level of regular safety training is correlated with the sense of physical safety during the performance of duties (0.807) proves the importance of the continuous education in terms of providing employees a feeling of safety. It means that regular training of employees will make the latter be more prepared to face the risks of the workplace thus making them feel more confident about the safety measures of the organization. Furthermore, the obtained result connects with the current

occupational safety sources focusing on training as a critical variable to minimize the risks and increase safety performance.

Among the most significant correlations is the one that is linked to psychological comfort at the workplace and physical safety, being equal to 0.852. This indicates the integration of physical and psychological safety meaning that when people are safe in the physical settings, they also have greater level of psychological safety. This reciprocity means that the physical safety measures go beyond preventing the actual harm as it also creates an environment where the employees feel safe in their minds finding it easier to relax and become satisfied with their jobs. This result gives catalytic strength to the holistic approach toward the workplace safety including the physical and psychosocial domain.

Just as noteworthy is that the correlation coefficient between the subject being subjected to regular training on safety and psychological comfort at the workplace is 0.848. This supports the argument that safety training does not only equip workers with the skills they can easily apply in the workplace, but have a significant role in their psychological well-being that leads to a feeling of readiness and effectiveness. Understanding risk and emergency management may help anyone feel less anxious and more confident which consequently creates a more positive working environment.

It is also found that the motivation to do better in job as the direction by the OHS practices also get high and similar correlations with the other variables all through. The highest affiliation is with regard to psychological comfort (0.831), which indicates that the more the employees feel secure in their minds because of the right safety arrangements, the more they become entered in their job. Also, the motivation being correlated strongly (0.828) to the availability of adequate resources signifies how organizational support can lead to a high performance of employees. The results of the present study indicate that OHS practices should not be viewed only as risk control prevention but as an additional source of motivation that increases the productivity and engagement of employees.

The willingness with which company approach workplace safety correlated perfectly well with availability of resources to implement safety to 0.906 which is a significant relationship association. Such a high value of the coefficient demonstrates that resource sufficiency is a key determinant of overall satisfaction with the company's safety practices. It implies that employees assess their organization's commitment to safety not just through policies and leadership communication but also through the tangible resources allocated for safety

purposes. This finding underscores the practical reality that without sufficient resources, even the most well-intentioned safety policies may fall short of employee expectations.

Conversely, the variable reflecting the issues related to the implementation of the OHS practices like budgetary constraints, resistance and bureaucracy had been found to be highly correlated with many factors, the highest being with the availability of resources that translates to 0.805 and also, with the satisfaction of the company in terms of their approach to safety that translates to a correlation of 0.787. These findings show that the problem of OHS measures implementation as perceived is strongly related to the satisfaction and resource distribution. When resources are scarce or there is a lot of red tape involved with implementation the employees will have worse views of the safety activities of the company. The existence of this correlation highlights the importance of simplification of a process and sufficient amount of funds in order to break the barrier and, therefore, to make safety programs more effective.

Further, the 0.869 proportion of the perceived difficulties of implementing OHS practices with the perception of the belief that raising the bar of safety practices would have a positive effect on overall job satisfaction indicates that there is a close connection between the elimination of barriers to implementation and an employee boost in morale. This finding shows that workers have a sense that overcoming the challenges that exist in the management of safety might give a high likelihood in improving on their general perception of work satisfaction. This kind of result demonstrates the need to establish a better organizational climate through constant improvement in safety systems and responsiveness to the feedback of the employees.

The other very important relationship that exists in the matrix is the 0.846 between the motivation to perform better and the belief that their safety practices would grow their job satisfaction. This implies that there is a direct connection between the motivational effect of OHS practices and the sense of the overall working experience of the employees. When the safety systems are viewed as efficient and constantly evolving, they tend not only to level work settings on the safer merit but also increase job satisfaction and personal motivation.

In the course of the analysis, there are correlations between variables that are above 0.70, and most of the variables portray a high degree of interconnectivity in the framework of OHS. The findings of these strong positive correlations indicate that occupational health and safety elements do not exist in independence but interact in integrated and systemic way. The

existence of these interconnectedness implies the systemic OHS management approach in which leadership, communication, training, the availability of the necessary resources, and clarity of the policies are all relevant in building the safety culture and work climate.

The general trend of the correlation matrix highly favors the conceptual model of the occupational health and safety practices as a multidimensional construct, which affects many elements of the organizational environment and experience of the subject employee. The positive and pronounced correlations in the results support the hypothesis that effective OHS practices tend to determine the increase in physical and psychological safety and motivation, as well as job satisfaction levels. Moreover, the connection between implementation difficulties and their general level of satisfaction indicates the sheer importance of the organizational structure and the regulation of resources in determining whether the OHS projects might turn out successful or not.

Such results confirm the systemic view on safety management promotion in the literature where the safety outcomes are observed as the outputs of organization-related factors interconnections, rather than as the results of focal initiatives. They further emphasize on the importance of an integrated approach relevant to organizations where an integrated approach overcomes the aspects of policy clarity, leadership participation, resource commitment, workforce training, as well as the reduction of barriers to attain comprehensive safety performance and employee well-being.

### 3. Regression Analysis

*Table 3 Regression Analysis Results Table*

| <b>Variable</b>                                                                           | <b>Coefficient</b> | <b>Std. Error</b> | <b>t-Statistic</b> | <b>P-Value</b> | <b>95% Confidence Interval</b> |
|-------------------------------------------------------------------------------------------|--------------------|-------------------|--------------------|----------------|--------------------------------|
| <b>Constant</b>                                                                           | <b>0.4889</b>      | <b>0.245</b>      | <b>1.994</b>       | <b>0.052</b>   | <b>[-0.004, 0.982]</b>         |
| <b>Management demonstrates a strong commitment to safety practices</b>                    | <b>0.1495</b>      | <b>0.098</b>      | <b>1.528</b>       | <b>0.133</b>   | <b>[-0.047, 0.346]</b>         |
| <b>There are sufficient resources available to implement safety practices effectively</b> | <b>0.7303</b>      | <b>0.103</b>      | <b>7.097</b>       | <b>0.000</b>   | <b>[0.523, 0.937]</b>          |

Model Statistics:

- R-squared = 0.830
- Adjusted R-squared = 0.823
- F-statistic = 114.8 ( $p < 0.001$ )
- Number of observations = 50

The regression analysis was designed to research the connection between occupational health and safety (OHS) practices and the level of satisfaction of the employees with the organizational approach toward workplace safety in the oil refining companies operating in Yanbu. In the selected model, two independent variables such as the commitment displayed by management to safety practices and availability of adequate resources in order to practice safety cited by management were used and the degree of the satisfaction expressed by employees with the safety approach of the company was determined as the dependent variable. The large R-squared of 0.830 implies that nearly 83 percent of the variance in

employee satisfaction can be accounted by the two predictors encompassed in the model and it is seen that the model is robust in terms of fitting the dataset under analysis.

Dwelling upon the obtained coefficients, the first independent variable, the variable of the type, which stated that, the Management is committed to safety practices strongly, produced the positive coefficient of 0.1495. This positive value indicates that there exists positive correlation between the commitment of management and satisfaction by the employees towards the safety at work. Nevertheless, its p-value is 0.133, which is higher than the standard value of 0.05 that would constitute statistical significance, therefore, this specific predictor, albeit offering some statistical backing in terms of the direction of its relationship with the hypothesis, is not statistically significant in the given sample. However, this positive correlation is in line with theoretical expectations in the literature, which regards management commitment as one of the basic factors of building proactive safety culture and improving the overall quality of the work environment.

the second independent variable, which is, There is adequate supply of resources to make safety practices effective, gave a highly significant result with its coefficient being 0.7303 and p-value being less than 0.001. A combination of significance in this range with large positive coefficient indicates the great importance of resource availability as a determinant affecting employee perception of safety and satisfaction. The above discovery can be attributed to the fact that once employees find that companies provide adequate resources; either financially, human resources, or technical resources to the safety program, employees will tend to perceive, realize and feel satisfied with what the company is doing towards ensuring occupational safety. This outcome substantiates the conceptual framework that resource commitment directly influences the effective implementation of safety measures and, by extension, enhances the organizational climate regarding safety.

The constant value was 0.4889 giving a borderline p-value of 0.052 and this represented the baseline point of satisfaction of the employees without reference to specific impacts of the independent variables. Despite its minor importance, it also indicates that some other factors that are not involved in this model may also have an impact on the perception of workplace safety in general, which can be investigated in the future research stage.

Considering the outcome of the regression, the overall significance of the model shown by F-statistic value of 114.8 ( $p < 0.001$ ) establishes the fact that the predictors used jointly will have significant explanatory power in respect to employee satisfaction with workplace safety.

This finding is a great boost to Hypothesis H1 which states that between the implementation of the OHS practices and the improvement of the work conditions at the oil refining organizations at Yanbu, there is a strong positive relationship. The close correlation between the safety satisfaction and resource allocation especially lays down special emphasis on the practical effect of the concrete aid in promoting better environment at work.

To shift to Hypothesis H2 that presumes that the existence of safety-related obstacles impairs the performance of the OHS practices, the analysis concludes with some relevant but non-direct insights. Even though this variable could not be directly incorporated to the regression model due to lower correlation and very broad level it was in agreement with above findings referencing the high correlation that already existed between resource availability and the sense of safety issues and strongly imply that there was an important relationship. In case the resources are considered inadequate, it can be supposed that such hindrances of implementation as budgetary limitation, resistance to change and bureaucracy will seem to the employees more severe. In such a way, the substantial finding of the model regarding resource availability indirectly confirms H2, stating that it is important to overcome practical difficulties to achieve maximum effect of OHS initiatives.

As far as Hypothesis H3 is concerned, according to which the employees who feel that their work environment is a safe one will exhibit higher level of motivation and job performance, the result of the regression analysis coupled with prior correlation results supports this assumption. Although motivation was not the dependent variable in this regression directly, the high correlation values between satisfaction with safety practices, perceived safety, and motivation variables (which were observed in previous analyses) suggests that there is a positive dynamic relationship. The major impact of resource provision on the satisfaction as well implies that where employees perceive good security in place, this makes them feel comfortable psychologically, which in turn can lead to greater efforts and better performance at their workplace.

In the case of Hypothesis H4, stating that the companies, which invest in continuous directions on safe work and awareness, have fewer accidents in the workplace and more compliance, training was not directly specified as one of the variables in the regression. Nonetheless, the literature that has been reviewed and correlation analysis conducted in the past in terms of the research paper have a strong correlation between regular training perceptions and perceptions of safety and compliance. The reasoning goes on further that the

companies that invest enough in such areas as training also see better safety results. This conforms to the high measure of resource availability which was found out during the regression analysis that can partly be accredited to the training programs and awareness initiatives. Therefore, even though H4 is not directly tested in this model, its results provided some backing in validating the hypothesis, particularly in light of a more comprehensive outlook of organizational resource allocation.

On the whole, the relationships that have been hypothesized in the study and that are validated with the help of the regression analysis are as follows. It validates empirically that the sufficiency of resources contributes significantly towards the positive perceptions of safety and satisfaction of employees in regard to the organizational practices. The finding supports even more the notion about the importance of a holistic approach to the OHS management that should not involve merely creation of the policy and declaration of commitment by the leaders, but also the real one to allocate funds and provide mechanisms of support of the OHS management.. The significant variance explained by the model highlights that effective safety practices, when adequately supported, significantly enhance the perceived quality of the work environment.

Secondly, as the variable of management commitment is not statistically significant, it creates possibilities of further research. It implies that although theoretically, it is worth being committed as a leader, its effect might be mediated or moderated by other characteristics, like the effectiveness of communications, enforcement uniformity, or reliability of the faith of employees in the operations of the administration. It points at the necessity of a more sophisticated perception of the role of leadership in safety management, possibly, a qualitative evaluation or the multi-level modeling in further researches.

Diagnostic statistics also provide strong support to the model as the Durbin-Watson statistic is 1.840 in the acceptable limits depicting lack of severe autocorrelation among residuals. Normality of indicator is not rejected according to the test results of the Omnibus and Jarque-Bera that yielded insignificant results. The results enhance the inferential case of the regression model and its use as a success in real-life industrial settings, especially in industrial environments that are prone to high risks like oil refineries.

In practical terms, by finding this, the importance of the resource allocation by the company working in the oil and gas industry, in particular in the industrial area of Yanbu, as a business strategy as far as safety programs are concerned, and not compliance requirement is put into

perspective. The increased resource delivery does not only facilitate an increase in the perceived level of safety culture but also leads to hard results including the employee satisfaction improvement, decreased mishaps, and possible organizational performance growth.

## **Discussion**

In the discussion of the research findings, the issues related to occupational health and safety (OHS) practices, challenges in the implementation of the OHS practices and enhancement of the work environment of the oil refining firms in Yanbu can be seen to bring forward much insight into the same. As the findings of descriptive, correlational, and regression analysis in this study revealed, OHS practices were primarily critical in controlling the influence on the psychological and operational dimensions of the workplace.

From the reliability of the instrument, the Cronbachs Alpha statistics confirmed the internal consistency value of the items as 0.975 which indicated high level of coherence between the responses and also supported the validity of further analysis. Such reliability justifies the results of said study by Ahmed et al. (2023) who pointed at the importance of the integrated and systematically evaluated OHS frameworks to add more credibility to the study carried out within the industrial setting.

It was shown as a result of descriptive statistics that the statement There are adequate resources to carry out safety practices sufficiently was given a high mean of 4.00 and a standard deviation of 1.21 which meant that there was an overall positive outlook on the part of the employees themselves. It concurred with Yilmaz and Yildiz (2021), who in turn highlighted, that providing adequate budgets and resources is one of the key aspects which enable attainment of sustainability in OHS practice. Correlation analysis also gave credence to this as the strong positive correlation ( $r = 0.906$ ) also indicated that resource availability categorically affected the satisfaction of the employees to the safety strategy employed by the company.

Regression analysis was used to give strong evidence to support the first hypothesis (H1). It was found that the independent variable there are enough resources at hand to carry out the safety practices with success and to be a good predictor of the satisfaction ( $0.7303$ ,  $p < 0.001$ ) that explains approximately 83 percent of the variance in satisfaction ( $R^2 = 0.830$ ). This is consistent with Saraswaty and Fadli (2024) findings that the efficiency of OHS policies has

positive effects on the psychological well-being of the employees especially when the given policies are well resource and enforced. The positive correlation is significant implying that organizations investing more resources towards making their workplaces safe bring about a perception that the working environment is safer and environmentally friendly among employees.

Conversely, the effect of the element of management that is strongly committed to exercising safety practice was found to be positive but not quite significant ( $\beta = 0.1495$ ,  $p = 0.133$ ). Although this outcome is not opposite to the previous, it indicates the fact that professor commitment on its own might not be the one because without the direct action and resources it might not be enough altogether. This somewhat confirms the observation of Nugraha et al. (2024), who concluded that the effectiveness of OHS should not be restricted to what management says but on how the synergy effects in policies, leadership conduct, as well as practices that occur during the digital age of safety management.

The interrelation between variable representations concerning safety practices and perceptions were also strong as shown by the correlation results obtained. As an example, the two items included in the scale, which exhibited the closest relationship to each other, were the statements: relating the variable to different output channels or the subsequent prism of outputs; 1) Management displays a strong commitment to safety practices, and 2) Supervisors and leaders play an active role in fostering a culture of safety. The correlation coefficients were  $r = 0.788$ . This is in line with the detection of Benson et al. (2021) who emphasized that leadership involvement in the petroleum and gas industry serves a decisive role in integrating safety culture and mitigating occupation health risks.

The hypothesis 2, i.e. safety-related issues have a negative impact on OHS practices, was indirectly supported. High positive correlations were identified between the variable satisfaction ( $r = 0.787$ ), the availability of resources ( $r = 0.805$ ) and the variable implementing OHS practices have obstacles (e.g. budget, resistance, bureaucracy). The provided findings indicate that barrier removal is directly associated with the increase in safety perceptions. Gorlenko and Murzin (2021) confirmed it by adding that comprehensive risk evaluation frameworks should address organizational and operational barriers that may potentially hinder OHS performance process within the production facilities of oil and gas industries.

With reference to H3, the attitude towards the personal safety in the workplace was highly related to other significant aspects. The relationship between the variables of the question, “I feel physically safe when carrying out my duties” and, “Safety concerns raised by employees are taken seriously”, were correlated to  $r = 0.853$ , which validated the connection between the ability of organizations to respond to their employees and the latter feeling physically secure. Moreover, its correlation with the Psychological comfort was  $r = 0.852$ , which underlines the importance of physical safety perceptions of promoting psychological comfort at work, and, thus, motivation and performance. This affirms the study by AlNoaimi and Mazzuchi (2021) who emphasized that risk management and participation of the employees in safety programs were directly related to better performance at the job place.

H4 was examined on the basis of correlation trends of safety training and other variables. The second statement, i.e., I receive regular training concerning workplace safety, was closely associated with the following two ( $r = 0.848$  and  $0.807$ ), respectively, i.e., the safety measures contribute to my psychological comfort at work, i feel physically safe in executing my duty, so it was confirmed that training programs are closely related to both physical and psychological feelings of safety. These outcomes also reflect whathalbemski et al. (2021) proposed about flexibility and resilience in corporate decision-making as a concept. particularly in risk management, are enhanced through continuous learning and training systems. Therefore, the implication is clear—investment in continuous safety training not only reduces incidents but also strengthens compliance and enhances the overall safety culture.

The fact that the regression model had a high level of explanation as well as strong correlation trends indicates that the work environment in oil refining companies is to a great extent determined by the manner in which OHS practices are not only applied but also reinforced in the organizational setup. The results are consistent with the approach to risk and safety management that uses multiple dimensions presented in Ahmed et al. (2023), and they prove the notion that the combination of multiple factors, such as leadership, allocation of resources, and the implementation of proactive risk management, is more efficient in enhancing a safe and sustainable work environment.

Furthermore, the interdependence between the variables under discussion can also attract the attention of two other authors that looked beyond the focus on a narrow concept and examined the context in a more comprehensive manner, as Settembre-Blundo et al. (2021)

stated that safety should not be treated as an isolated issue since it should be viewed through the prism of a complex system that takes into consideration organizational culture and employee engagement, as well as business realities.

Conclusively, findings of this research paper support the hypotheses and validate the outcome of some of the landmark subsets of research in the occupational safety domain. The analysis of the data supports the suggestion of a complex vision of OHS management, i.e., the combination of the leader commitment, sufficient resource distribution, ongoing training, and preventive mitigation of challenges. The results support the finding that a well designed safety management system is essential in high risk establishment in the industry of oil refining not just in minimizing incidences of accidents and improving compliance but also chances of increasing staff morale, motivation and the performance of the organizations as a whole.

Such insights not only have academic incentive but also are helpful in practical contexts hence provide a good point of reference to policymakers, managers and researchers interested in improving occupational health and safety outcomes in industrial settings.

## Findings

- The statistical analysis revealed a strong and positive correlation between the availability of resources for implementing occupational health and safety (OHS) practices and employee satisfaction with the workplace environment ( $r = 0.906$ ).
- The regression model confirmed that resource availability is the most significant predictor of employee satisfaction, with a coefficient of **0.730** and a high statistical significance ( $p < 0.001$ ).
- Management's commitment to OHS showed a positive but statistically insignificant effect ( $\beta = 0.1495$ ,  $p = 0.133$ ), indicating that leadership commitment alone is insufficient without practical support and resource allocation.
- The presence of implementation challenges, such as budget constraints, resistance to change, and bureaucracy, negatively impacted the effectiveness of OHS practices and employee perceptions.
- Regular safety training exhibited a strong positive correlation with both the employees' sense of physical safety and psychological comfort ( $r$  with **physical safety** = **0.807**,  $r$  with **psychological comfort** = **0.848**).
- The study findings support all four research hypotheses (H1–H4), confirming the critical role of integrated management, adequate resources, ongoing training, and addressing challenges in enhancing the work environment in the oil refining industry.

## Recommendations

- Allocate sufficient budgets and ensure sustainable resources to effectively implement OHS practices in oil refining companies.
- Strengthen the role of leadership in promoting a proactive safety culture through practical engagement, not just policy declarations.
- Establish continuous, updated training programs tailored to the specific risks of the oil refining sector to ensure workforce preparedness and compliance.
- Address organizational and bureaucratic challenges that hinder the effective implementation of safety measures by improving policies and streamlining processes.
- Implement a regular monitoring and evaluation system for safety practices, involving employee participation in feedback and improvement mechanisms.
- Enhance internal communication between management and employees to foster a responsive safety reporting system and prompt action on identified risks.

This paper has reached the conclusion that the resource adequacy, earnestness of leadership and on-going employee training have great importance when the implementation of the occupational health and safety practices in the oil refining companies are to be carried out successfully. Although leadership commitment is significant it should be backed up with actual actions and adequate resources to work. A combination of the most complete risk management strategies and the continuation of constant safety programs enhance considerably the psychological and physical well-being of the work sphere. The results help outline the importance of oil refining corporations to implement a comprehensive proactive approach to OHS and they recommend this approach in particular to open new plants in high-hazard settings such as Yanbu. This practice will increase satisfaction levels of employees, minimize activities at workplaces, create a culture of safety and sustainable performance of organizations based on international safety standards.

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## **Appendices**

### **The survey**

Dear Participant,

You are invited to take part in this research study which aims to assess the current occupational health and safety (OHS) practices and the challenges associated with their implementation in oil refining companies in Yanbu. Your responses will help us gain valuable insights into how safety measures impact the quality of the work environment and employee well-being.

Participation in this survey is voluntary and all information provided will be kept strictly confidential and used for academic purposes only. The questionnaire consists of three sections and should take approximately 10–15 minutes to complete.

We greatly appreciate your time and valuable input.

Sincerely,

**Hattan Abdulaziz Makki**

Master's Student – Midocean University

#### **Section 1: Demographic Information**

**1. Gender:**

☐ Male

☐ Female

**2. Position in the company:**

☐ Technician

☐ Supervisor

☐ Safety Officer

☐ Operations Staff

- ☐ Administrative Staff
- ☐ Other (please specify): \_\_\_\_\_

**3. Years of experience in the oil and gas sector:**

- ☐ Less than 1 year
- ☐ 1–3 years
- ☐ 4–6 years
- ☐ 7–10 years
- ☐ More than 10 years

**Section 2: Main Survey Items (5-Point Likert Scale)**

**Instructions:** Please indicate your level of agreement with each of the following statements.

**(1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)**

| # | Statement                                                                           | 1                        | 2                        | 3                        | 4                        | 5                        |
|---|-------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | The company has clear and well-communicated OHS policies.                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 | Safety procedures are regularly reviewed and updated.                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 | I receive regular training related to workplace safety.                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 | Safety drills and emergency procedures are well organized.                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 | Safety communication between management and employees is effective.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 | Supervisors and leaders actively promote a safety culture.                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 | Management demonstrates a strong commitment to safety practices.                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8 | There are sufficient resources available to implement safety practices effectively. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

|    |                                                                                     |                          |                          |                          |                          |                          |
|----|-------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 9  | Safety concerns raised by employees are taken seriously.                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10 | I feel physically safe while performing my duties.                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11 | The safety measures contribute to my psychological comfort at work.                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12 | OHS practices motivate me to perform better in my job.                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13 | I am satisfied with the company's approach to workplace safety.                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14 | Implementing OHS practices faces obstacles (e.g., budget, resistance, bureaucracy). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 15 | Improving safety practices would positively impact overall job satisfaction.        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### Section 3: Open-Ended Questions

1. In your opinion, what are the main challenges that hinder the effective implementation of occupational health and safety practices in your company?

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2. What suggestions or recommendations do you have to improve workplace safety in your organization?

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