University of Strathclyde

Centre for Lifelong Learning

Safety Climate Assessment at Construction Sites in Kenya

By:
Collins Omondi Kamol

A dissertation presented in fulfilment of the requirements for the degree of Master of Science in Safety and Risk Management

Submitted: August 8, 2025

Abstract

Kenya is experiencing steady growth in its construction sector; a labour-intensive industry characterized by a high demand for unskilled workers. Despite its economic significance, the construction sector continues to exhibit elevated levels of occupational accidents and injuries. This research sought to assess safety climate across three construction sites in Kenya using the Nordic Occupational Safety Climate Questionnaire (NOSACQ-50). Data collected were analyzed using SPSS version 29. Descriptive analysis for each dimension of the NOSACQ-50 was performed to describe the level and spread of safety climate scores at each construction site. Spearman's correlation analysis was used to assess the relationship between safety climate scores (outcome variable) and independent variables (socio-demographic factors, work experience, and knowledge of occupational injury occurrence). The level of significance was set at $p<0.05$. Cronbach's alpha was performed to assess the internal consistency of each climate dimension score. The research revealed that there was consistent divergence between leader and worker safety climate scores. There was a pronounced gender imbalance across all sites, with male participants comprising the vast majority. Among the three construction sites, CS1 had the lowest safety climate scores in every category. CS2's results were mixed; it scored in the "good" range (3.13 or higher) for Dimensions 1, 2, 3, 6, and 7, but lower in the others. CS3 scored higher than both CS1 and CS2 in every category, with all scores above 3.18 and most above 3.30. At CS1 and CS3, age (Dim4, r=0.294, $p<0.025$; Dim6, r=0.299, $p<0.022$) and education level (Dim3, r=0.387, $p<0.002$; Dim4, r=0.463, $p<0.001$; Dim6, r=0.412, $p<0.001$; Dim7, r=0.486, $p<0.001$) were positively correlated with safety climate respectively. A significant association was observed between knowledge of occupational injury occurrence at CS1 (Dim2, r=0.257, $p=0.006$). The divergence between leader and worker scores highlights the need for improved engagement, communication, and transparency to align safety climate perceptions across roles. Key stakeholders in the construction sector, including the Ministry of Labour and Social Protection, the National Construction Authority, and construction

companies, should formulate occupational health and safety measures based on the demographic characteristics of different worker sub-groups. Construction companies with a higher concentration of less experienced workers should implement more intensive onboarding and safety orientation programs to mitigate potential occupational health and safety risks. Companies should increase worker participation in safety initiatives and communicate more effectively about safety risks and procedures.

Acknowledgments

This dissertation has been developed thanks to the commitment of several generous people. I would like to acknowledge the professional guidance provided by my supervisor, Simon Fleming. Developing this dissertation has been both a challenging and rewarding journey. Along the way, I met Prof. Pete Kines, whose candour and confidence in me kept me motivated. I am deeply indebted to the construction workers in Kenya who generously shared their time and expressed interest in participating in this research. Finally, I would like to thank my wife, Victoria, for her encouragement and unwavering belief in me throughout this demanding academic expedition.

Table of Contents

List of Tables

List of Figures

Glossary

Construction Site (CS)	A place where construction work is undertaken, referred to in this research as CS1, CS2, and CS3.
Dimension (Dim)	One of the elements of factors making up a complete safety climate construct.
NOSACQ-50	A tool developed to assess perceptions of individuals within an organization towards health and safety.

Chapter One: Introduction

1.1 Research Background

The construction sector is one of the most hazardous sectors in the world (Marín *et al*., 2019). It is also one of the fastest-growing sectors globally (Olutende *et al*., 2021). Like many other lower-middle-income countries (LMICs), Kenya is witnessing steady growth in its construction sector, which is known for its high demand for unskilled labour. The sector is prone to accidents, as workers often prioritize employment over their working conditions (Olutende *et al*., 2021). Despite governmental efforts to enhance safety and health protocols in construction sites in Kenya, the persistence of accidents, injuries, and fatalities remains a critical concern (Legishion, Wachira and K'Akumu, 2024). Kemei and Nyerere (2016) highlighted several factors contributing to accidents on construction sites, including reluctance to allocate resources for safety, lack of staff training, absence of a safety policy, poor enforcement of safety regulations, limited safety awareness among workers, and lack of strict operational procedures. According to Sutalaksana, Anatasia and Yassierli (2016), safety climate is a reliable predictor of workplace injury risk, while also encompassing broader organisational determinants that significantly influence occupational health and safety outcomes. These outcomes, in turn, play a critical role in shaping overall worker performance (Brandt *et al*., 2021). Construction companies therefore need to do much more to protect their workers from accidents (Kemei and Nyerere 2016; Makori, Mamati and Njoroge, 2018; Olutende *et al*., 2021).

1.2 Problem Statement

Although a wide range of safety climate measurement tools have been developed, their application are often limited by methodological shortcomings. These include ambiguous definitions and interpretations of key concepts such as 'safety climate' as well as the exclusion of essential dimensions that are critical to a comprehensive assessment of safety climate (Summers, Harries and Kirby, 2022). Among more than 200 available instruments, only approximately 15 have been deemed methodologically robust and practically satisfactory, with the NOSACQ-50 recognized as one of the most reliable and theoretically grounded tools (Summers, Harries and Kirby, 2022). NOSACQ-50 has demonstrated effectiveness in predicting safety outcomes and capturing variations in safety climate across different occupational and cultural contexts (Kines *et al*., 2011). The application of the NOSACQ-50 in Kenya however remains limited. Specifically, there is a notable lack of research assessing its practical relevance and reliability as a diagnostic tool for assessing safety climate within Kenya's construction sector.

1.3 Research Justification

Construction workers face elevated exposure to occupational hazards (Legishion, Wachira and K'Akumu, 2024). The inherently dynamic and complex nature of construction sites, marked by ever-changing environments, and diverse tasks, poses significant challenges to the implementation and maintenance of effective occupational safety and health measures (Legishion, Wachira and K'Akumu, 2024). NOSACQ-50 has gained widespread recognition as a robust instrument for assessing safety climate, with substantial empirical support for its reliability and validity across various sectors and organizational contexts (Summers, Harries and Kirby, 2022). Despite its demonstrated diagnostic value in identifying workplace safety issues, the use of NOSACQ-50 remains notably limited in Kenya, particularly within independent worker groups. This study sought to address this critical gap by applying the NOSACQ-50 to evaluate safety climate among construction workers in informal and independent settings. In doing so, it aimed to contribute to the growing body of knowledge on the value of safety climate assessment tools and to establish a foundational baseline that can inform future investigations into occupational safety climate in Kenya.

1.4 Research Aim

To investigate the safety climate at construction sites in Kenya using the Nordic Occupational Safety Climate Questionnaire (NOSACQ-50).

1.5 Research Objectives

1. To define and describe safety climate and safety culture.
2. To discuss safety climate construct and its relationship with safety culture and safety performance.
3. To evaluate the safety climate level at construction sites in Kenya using NOSACQ-50.
4. To explore the factors impacting safety climate and their relationship with the safety climate level at construction sites in Kenya using NOSACQ-50.
5. To make recommendations for improving safety performance within the construction sector in Kenya.

Below is a list of significant factors (SFs) associated with each objective, to help address what the research intends to find out.

Objective 1: To define and describe safety climate and safety culture.

- SF1: Define contextual applications of safety climate in construction
- SF2: Define safety climate.
- SF3: Define safety culture.

Objective 2: To discuss safety climate construct and its relationship with safety culture and safety performance.

- SF1: Describe the relationship between safety climate and safety culture.
- SF2: Describe the relationship between safety climate and safety performance.

Objective 3: To evaluate the safety climate level at construction sites in Kenya using NOSACQ-50.

- SF1: Describe safety climate assessment.
- SF2: Define measures of safety climate.

Objective 4: To explore the factors impacting safety climate and their relationship with the safety climate level at construction sites in Kenya using NOSACQ-50.

- SF1: Describe the distribution of participants across three construction sites (CS1, CS2, and CS3).
- SF2: Describe the socio-demographic characteristics of participants across three construction sites (CS1, CS2, and CS3).
- SF3: Describe the distribution of participants' work experience across three construction sites (CS1, CS2, and CS3).
- SF4: Describe the knowledge of occupational injury occurrence among participants across three construction sites (CS1, CS2, and CS3).
- SF5: Describe the level and spread of safety climate scores across three construction sites (CS1, CS2, and CS3).
- SF6: Describe the relationship between sociodemographic characteristics of participants and safety climate scores across three construction sites (CS1, CS2, and CS3).
- SF7: Describe the relationship between participants' work experience and safety climate scores across three construction sites (CS1, CS2, and CS3).
- SF8: Describe the relationship between participants' knowledge of occupational injury occurrence and safety climate scores across three construction sites (CS1, CS2, and CS3).
- SF9: Assess the internal consistency of each climate dimension score across the three construction sites (CS1, CS2, and CS3).

Objective 5: To make recommendations for improving safety performance within the construction sector in Kenya.

- SF 1: Using the findings, fill an important data gap and contribute to the existing knowledge regarding occupational health issues faced by construction workers in Kenya.
- SF 2: Based on the results, make practical recommendations for the companies in the construction sector that could increase awareness about the risks associated with construction work.

1.6 Conceptual Framework

The conceptual framework below illustrates the interrelationships between the dependent and independent variables. This framework demonstrates how the independent variables; sociodemographic factors (gender, age, level of education), work environment factors (experience/duration of employment), and awareness of occupational injury occurrences collectively contribute to shaping the overall safety climate of a workplace.

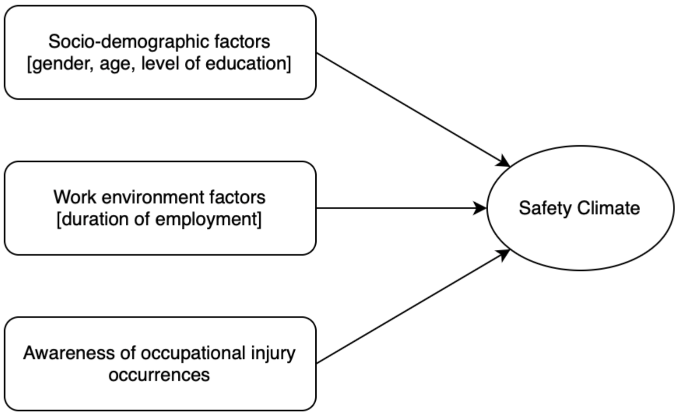

Figure 1 Conceptual framework (Courtesy: Collins Kamol, 2025).

Chapter Two: Literature Review

This chapter reviewed existing literature relevant to the research topic, identified significant factors (SFs), and analyzed them.

2.1 OSH in the Kenyan Context

Occupational safety and health (OSH) in Kenya has undergone notable development since the enactment of the Occupational Safety and Health Act in 2007, commonly referred to as OSHA 2007 (Kenya Institute of Public Policy Research Analysis [KIPPRA], 2021). This legislation is aimed at promoting workplace safety, preventing occupational injuries and illnesses, and safeguarding third parties from harm arising from work-related activities (KIPPRA, 2021). Despite the regulatory framework provided by OSHA 2007, occupational injuries continue to occur on construction sites (Kemei and Nyerere, 2016).

In alignment with its long-term development blueprint, Vision 2030, the Kenyan government introduced the "Big Four" agenda in 2017. This initiative focuses on four key pillars: manufacturing, affordable housing, universal health coverage, and food security and nutrition. While the agenda is primarily geared toward accelerating economic growth and enhancing the country's GDP, limited attention has been given to the occupational risks faced by the substantial workforce engaged in these sectors (Legishion, Wachira and K'Akumu, 2024). Consequently, concerns remain regarding the adequacy of existing OSH legislations in protecting workers operating in potentially hazardous environments in low-and middle-income countries such as Kenya (Ncube and Kanda, 2018).

2.2 The Construction Sector

The construction sector is characterized by its unique operational context, primarily because its activities are often conducted outdoors under conditions that are typically not conducive to safety and worker well-being (Mohammadi, Tavakolan and Khosravi, 2018; Ademola, 2020). Construction projects are structurally and operationally complex due to the diverse building processes, and human resources involved in their execution (Marín *et al*., 2019). Workers in this sector are frequently required to adapt to dynamic and unpredictable environments, including changes in work tasks, locations, and team compositions (Ademola, 2020). As a result, the construction industry is widely perceived as a high-risk occupation, with significantly greater exposure to hazards compared to other sectors (Makori, Mamati and Njoroge, 2018).

Consistently ranked among the most hazardous industries globally in terms of both fatal and non-fatal work-related injuries, the construction sector's risk profile is shaped by the interplay of complex work processes, site-specific conditions, and the socio-demographic characteristics of its workforce (Marín *et al*., 2019; Alamoudi, 2022; Kima *et al*., 2024). The interaction between high-risk activities, challenging site environments, and extensive use of machinery contributes to the inherently dangerous and accident-prone nature of construction work (Kima *et al*., 2024). Moreover, the demand for task completion often leads workers to focus intently on their immediate duties, potentially neglecting broader situational hazards and increasing vulnerability to accidents (Marín *et al*., 2019).

In the Kenyan context, construction, alongside agriculture and manufacturing, is recognized as a key pillar of the national development agenda under Vision 2030. The sector is expected to experience rapid growth, particularly in response to increasing urbanization and housing demands (UN-HABITAT, 2022). To address the country's acute housing shortage, the government launched an affordable housing initiative in 2022, targeting the construction of 250,000 housing units annually for low-income populations residing in informal settlements (UN-HABITAT, 2022). This anticipated expansion underscores the urgent need to address occupational safety and health challenges within the construction sector, particularly as it absorbs a growing and often vulnerable labour force.

Figure 2 President Ruto greeting construction workers in Nairobi (Courtesy: Joseph Muia, 2023).

Similar to many other lower-middle-income countries (LMICs), Kenya is experiencing steady growth in its construction sector, a labour-intensive industry characterized by a high demand for unskilled workers (Olutende *et al*., 2021). This expansion, however, is accompanied by a heightened risk of occupational accidents, as workers frequently prioritize income generation over safe working conditions (Ademola, 2020; Olutende *et al*., 2021). Despite the evident risks, reliable data on occupational incidents within Kenya's construction industry remains scarce, primarily due to widespread underreporting (Nyabioge, Wachira-Towey and Ralwala, 2022).

Kemei and Nyerere (2016) identified multiple systemic and organizational shortcomings that contribute to the prevalence of construction site accidents. These include inadequate allocation of resources for safety, lack of worker training, absence of formal safety policies, weak enforcement of existing safety regulations, limited awareness of occupational risks among workers, and the absence of standardized operational procedures. Findings from studies (Kemei and Nyerere, 2016; Makori, Mamati and Njoroge, 2018) consistently emphasize the urgent need for construction companies in Kenya to strengthen their occupational safety practices and take more proactive measures to protect their workforce. Nevertheless, there is a growing perception that many construction workers have become resigned to these occupational hazards, accepting them as an inherent part of the job (Olutende *et al*., 2021).

2.2.1 Nature of construction sites

Construction sites are typically organized within a hierarchical, project-based structure that involves a diverse array of stakeholders, including large firms, small enterprises, and independent contractors (Marín *et al*., 2019). Within this structure, roles such as project managers, site managers, field supervisors, and workers coexist, often resulting in complex and sometimes ambiguous management dynamics (Marín *et al*., 2019; Al-Bayati, 2021).

Project managers are generally responsible for the overarching coordination of construction activities across multiple worksites, ensuring that project objectives are met in alignment with organizational goals (Marín *et al*., 2019). Site managers, who serve as the construction company's permanent representatives on-site, oversee the administration of daily operations and supervise the performance of site-based contractors (Marín *et al*., 2019). Field supervisors function as intermediaries, facilitating communication and coordination between workers, subcontractors, and site managers. They are tasked with overseeing the day-to-day execution of construction tasks and ensuring effective management of both the company's employees and subcontracted labour on site (Marín *et al*., 2019).

The delineation of responsibilities and authority across these roles contributes to differing interpretations of occupational safety and health. Project managers, site managers, supervisors, and subcontractors may hold divergent perspectives on what constitutes adequate safety measures and how safety protocols should be implemented (Marín *et al*., 2019; Ademola, 2020; Alamoudi, 2022). These differences can pose challenges to the consistent and effective application of safety practices across construction sites.

2.3 Safety Climate

Safety climate refers to the shared perceptions among employees regarding the importance placed on safety within the workplace, as reflected in organizational policies, procedures, and practices (Yousefi *et al*., 2016; Saleem and Malik, 2022). Marín *et al*. (2019) further conceptualize safety climate as a group-level construct, wherein employees occupying similar roles, physical workspaces, or supervisory structures develop collective perceptions about the degree to which senior management prioritizes safety. Perception, in this context, is defined as the process through which individuals interpret environmental stimuli via their sensory mechanisms (Sukapto *et al*., 2018). These stimuli, shaped by an individual's attitudes, beliefs, and past experiences, may be accepted, ignored, or rejected, depending on one's cognitive framework (Sukapto *et al*., 2018). Perceptual processes are closely linked to an individual's knowledge, skills, and experiences and are believed to influence the likelihood of occupational accidents (Shea *et al*., 2021). Indeed, perceptual errors have been identified as contributing factors in many workplace incidents (Beus *et al*., 2019).

Shared perceptions of safety inform workers about management's commitment to their health and safety, thereby influencing task-related behaviours, particularly in high-risk environments (Zohar, 2013). According to Zohar (2013), these perceptions emerge from the collective experiences of employees and reflect the extent to which they believe management invests in their well-being. This, in turn, fosters the development of congruent expectations regarding safety-related behaviors and outcomes. Empirical evidence supports the link between perception and safety climate. A cross-sectional study by Wibowo, Lestari, and Modjo (2023) involving fuel station workers in West Java, Indonesia, found that safety training had the strongest influence on safety climate, with workers who had undergone training reporting significantly higher safety climate perceptions. Similarly, a study by Arooj *et al*. (2022) among power station employees in Pakistan identified low scores in areas such as worker safety prioritization and risk non-acceptance, highlighting areas of concern within safety culture implementation.

Perceptions of safety climate can vary considerably across sectors and occupational roles, as different job positions offer differing levels of exposure to safety practices and risks (Marín *et al*., 2019). In the construction industry, for instance, safety climate perceptions often differ across occupational groups, trades, and personnel. These variations may be attributed to the coexistence of multiple subcultures and the inconsistent implementation of safety programs (Marín *et al*., 2019; Saleem and Malik, 2022).

2.4 Safety Culture

Safety culture is generally regarded as having several interconnected elements that together influence organisational safety performance. However, there remains no universally accepted definition. While literature often references attributes such as shared values, beliefs, management commitment, competencies, and organizational practices as key dimensions of safety culture, a definitive consensus on these components has yet to be established (Churruca *et al*., 2021). A positive safety culture fosters an environment in which safety is prioritized at all organizational levels, and all activities related to safety are perceived as integral to operational success (Yari *et al*., 2019). In contrast, a negative safety culture reflects an environment in which safety is undervalued or inconsistently applied. Yari *et al*. (2019) note that between 85% and 98% of unsafe behaviours leading to workplace accidents can be attributed to the presence of a weak or negative safety culture.

Empirical findings further emphasize the critical role of safety culture in high-risk sectors. For instance, Restuputri *et al*. (2021) identified the steel industry as having the highest incidence of occupational diseases, with 0.7 cases reported per 1,000 workers. As occupational risks continue to evolve due to technological, organizational, and environmental changes, researchers such as Naji *et al*. (2021) and Restuputri *et al*. (2021) argue that safety culture will play an increasingly pivotal role in mitigating these hazards. An effective safety culture not only raises awareness of workplace risks but also influences employees' beliefs, attitudes, behaviours, and perceptions concerning occupational safety (Naji *et al*., 2021; Restuputri *et al*., 2021).

Despite its importance, the assessment and implementation of safety culture remain challenging. Measuring safety culture is inherently time consuming and methodologically complex, often requiring longitudinal efforts and multi-level analysis to capture its full impact across an organization.

2.5 Relationship between Safety Climate and Safety Culture

Although the terms safety culture and safety climate are often used interchangeably, they represent distinct yet interrelated constructs. Safety culture refers to the underlying values, beliefs, and organizational priorities concerning the safety and health of workers, as manifested through formal policies, procedures, and practices. In contrast, safety climate captures employees' shared perceptions of the work environment, including management behaviours, operational practices, and individual attributes such as safety attitudes, awareness, and risk perception, all within the context of occupational safety and health (Luo, 2020; Schwatka, Hecker and Goldenhar, 2016).

Safety climate can be understood as a temporal or surface-level representation of the deeper, more enduring elements of safety culture. It reflects the collective perceptions of safety at a particular point in time and is therefore sensitive to situational factors and organizational dynamics (Schüler, 2022). Unlike safety culture, which is deeply embedded and evolves gradually, safety climate is more fluid and responsive to the immediate work environment. Vu and Cieri (2015) contend that while all organizations possess an overarching organizational culture, there is ongoing debate regarding whether every organization has a distinct safety culture. According to their perspective, a genuine safety culture exists only in organizations that prioritize safety as a fundamental value. Under this interpretation, relatively few organizations can be said to possess a fully developed or authentic safety culture, regardless of whether their safety culture is characterized as strong, weak, positive, or negative.

The distinction between safety culture and safety climate lies primarily in their depth and formation: safety culture represents the ingrained, foundational elements of an organization's safety orientation, while safety climate offers a more immediate, measurable snapshot of these deeper cultural values (Ademola, 2020; Saleem and Malik, 2022). Because of its perceptual and surface-level nature, safety climate is often used as a proxy measure to assess and monitor the state of safety culture within organizations.

Both safety culture and safety climate are socially constructed phenomena that emerge through shared experiences and collective understanding among members of a group. Ademola's (2020) conceptual framework for optimizing safety climate and safety culture on construction sites highlights the central role of top management in fostering an environment conducive to safety. The framework emphasizes the importance of internal psychological factors such as management commitment, worker involvement, compliance with safety protocols, and the dissemination of safety knowledge as critical elements for improving safety climate.

When organizations demonstrate a clear understanding of the importance of occupational safety and health, they are more likely to invest in developing both a positive safety climate and, by extension, a strong safety culture. Ademola (2020) further argues that recognizing and addressing the behavioral, organizational, and environmental factors influencing safety climate allows it to shape the developmental, operational, and strategic paradigms of safety culture. Achieving this requires deliberate efforts to enhance workers' safety knowledge and to motivate compliance and active participation in safety initiatives (Ademola, 2020; Luo, 2020; Arooj *et al*., 2022).

2.6 Relationship between Safety Climate and Safety Performance

Safety climate has increasingly been employed as a key indicator for assessing safety performance across a wide range of industries, offering a temporal snapshot of an organization's prevailing safety conditions (Zohar, 2013; Yousefi *et al*., 2016; Yari *et al*., 2019; Alamoudi, 2022). It is widely recognized as a critical factor influencing both safety compliance and safety participation; two key dimensions of individual and organizational safety performance (Nadhim *et al*., 2018).

As a construct that reflects workers' perceptions and attitudes toward safety at a specific point in time, safety climate serves as a reliable predictor of safety performance (Ajslev *et al*., 2018). It reveals underlying organizational and cultural dynamics that may contribute to occupational injuries and incidents (Ajslev *et al*., 2018). Employees who perceive their work environment as supportive of safety are generally less likely to engage in unsafe behaviours (Saleem and Malik, 2022). Vu and Cieri (2015) affirm that safety climate is a strong indicator of safety-related outcomes, including workplace injury and illness rates. Moreover, Saleem and Malik (2022) argue that a positive safety climate promotes risk-avoidant behaviours, encourages adherence to safety practices, and ultimately enhances overall safety performance.

Functioning as an observable indicator of the deeper construct of safety culture, safety climate is shaped by both organizational and individual behaviours (Yari *et al*., 2019; Syed-Yahya, Idris and Noblet, 2022). A strong safety climate fosters safe behaviours among employees, particularly in high-risk environments, and is positively associated with increased compliance with safety protocols (Zohar, 2013). In contrast, a weak or negative safety climate is often linked to elevated levels of work-related stress, anxiety, injury rates, and injury severity (Vu and Cieri, 2015).

A growing body of research has explored the predictive power of safety climate on workplace safety and health outcomes across sectors (Schwatka, Hecker and Goldenhar, 2016). Studies by Nadhim *et al*. (2018) and Luo (2020), for example, have utilized the safety climate construct to examine mechanisms for improving safety performance in various organizational contexts. These investigations consistently identify management commitment to safety as a central dimension of safety climate and a key determinant of safety outcomes (Froko, Maxwell and Kingsley, 2015; Hertanto *et al*., 2023).

In the construction context, Nadhim *et al*. (2018) reported a positive correlation (r=0.60) between safety climate and safety performance in retrofitting projects in Australia. Similarly, Ajslev *et al*. (2017) found that safety climate deficiencies such as poor communication and inadequate managerial support, were directly linked to an increased risk of workplace accidents. A negative safety climate, they argue, can also impair hazard recognition and weaken preventive safety behaviours (Alamoudi, 2022).

Understanding the relationship between safety climate and safety performance requires an in-depth examination of the underlying factors that influence safety climate. Saleem and Malik (2022), for instance, identified a strong positive impact of safety climate on safety performance among employees in the pharmaceutical sector in Pakistan.

Despite its growing global relevance in other African countries such as Nigeria, the application of the safety climate construct remains limited in high-risk sectors in Kenya, particularly in construction. Few studies have systematically explored how safety climate can be leveraged to improve occupational health and safety (OHS) outcomes in the Kenyan construction industry. Given the hazardous nature of construction work, building and sustaining a positive safety climate is critical for improving safety performance and reducing accident rates on construction sites in Kenya.

2.7 Safety Climate Assessment

Safety climate assessment has emerged as a valuable tool for identifying safety-related concerns before incidents occur, thereby supporting proactive safety management (Arooj *et al*., 2022). By employing rubric-based descriptors to evaluate safety climate with consistency and reliability, such assessments influence both individual and organizational safety behaviours and attitudes. Moreover, safety climate assessment contributes to the enhancement of overall safety culture and employee well-being (Arooj *et al*., 2022). As an antecedent to safety performance, safety climate assessment offers a comprehensive, forward-looking foundation for improving safety outcomes, as opposed to reactive approaches that rely primarily on retrospective indicators such as injury statistics and incident reports (Kines *et al*., 2011; Shea *et al*., 2021).

While the concept of assessing safety climate is not new, it has gained increasing prominence in recent years. Several studies (Froko, Maxwell and Kingsley, 2015; Ajslev *et al*., 2017; Sukapto *et al*., 2018; Arooj *et al*., 2022; Summers, Harries and Kirby, 2022; Wibowo, Lestari and Modjo, 2023) have examined safety climate across a range of industries and geographical contexts. Despite this growing body of global research, the application of safety climate assessment remains limited in Kenya's high-risk sectors, particularly in the construction industry. This gap underscores the need for context-specific research and highlights the potential of safety climate assessment as a strategic tool for improving occupational safety and health in the Kenyan construction sector. The present study aims to contribute to this emerging discourse by advancing the understanding of safety climate within Kenya's construction context.

2.8 Measuring Safety Climate

According to Vu and Cieri (2015), the measurement of safety climate serves multiple purposes within organizational safety management. These include assessing an organization's current status regarding occupational safety and health, identifying priority areas for resource allocation to strengthen safety culture, establishing baseline data for evaluating the effectiveness of safety interventions, and tracking progress toward established safety climate and culture objectives.

Over the years, numerous safety climate assessment tools have been developed and validated for use across diverse sectors and occupational settings (Alamoudi, 2022; Summers, Harries and Kirby, 2022). Despite their widespread adoption, several concerns have been raised regarding the comprehensiveness and effectiveness of these instruments (Alamoudi, 2022). Although safety climate is widely acknowledged as a multidimensional construct, many existing measurement tools fail to fully capture its complex, multilevel nature (Shea *et al*., 2021). These tools often vary significantly in terms of content, structure, analytical approach, and sampling design, including differences in sample size, demographic composition, and target population (e.g., managers, supervisors, frontline workers) across different industries and national contexts (Choudhry, Fang and Lingard, 2009). Furthermore, perceptions of safety climate are not uniform and may differ considerably between sectors, organizations, and occupational roles (Alamoudi, 2022). To ensure that safety climate assessments yield meaningful and actionable insights, it is imperative that the measurement tools employed are both psychometrically robust and contextually appropriate. Each survey item should accurately reflect relevant safety-related behaviours and attitudes to produce results that can inform effective safety policies and drive continuous improvement in workplace safety practices.

2.8.1 Safety climate dimensions

While there is broad consensus on the general definition of safety climate, considerable debate persists regarding its dimensional structure (Ryan, 2021). Although other researchers (Shea *et al*., 2021; Summers, Harries, & Kirby, 2022) agree that safety climate is both a multi-dimensional and multi-level construct, there is ongoing disagreement concerning the precise number and nature of its constituent dimensions (Ryan, 2021). These discrepancies in dimensionality may be attributed to variations in study populations, the methods used for questionnaire development, and the specific wording of survey items (Choudhry, Fang and Lingard, 2009; Alamoudi, 2022; Summers, Harries and Kirby, 2022).

Existing safety climate instruments vary considerably in length and complexity in how they assess the safety climate construct. According to Ademola (2020), a review of related studies indicates that most identified dimensions focus on employees' perceptions of organizational characteristics such as leadership and systems, and on their own competence, both of which significantly influence safety behaviours and outcomes. Ryan (2021) further identifies management commitment, safety systems, risk perception, work pressure, and employee competence as the most frequently assessed dimensions in contemporary safety climate research. Routine assessment of safety climate is essential for identifying specific areas in need of improvement. By pinpointing these dimensions, organizations can develop targeted safety interventions that enhance both compliance and overall workplace safety (Wibowo, Lestari and Modjo, 2023).

2.9 Nordic Occupational Safety Climate Questionnaire (NOSACQ-50)

One of the most widely recognized and empirically validated instruments for assessing safety climate is NOSACQ-50 (Wibowo, Lestari and Modjo, 2023). Developed by a team of Nordic occupational safety researchers, NOSACQ-50 comprises 50 items, of which 29 are positively worded and 21 are negatively worded (Sukapto *et al*., 2018). The inclusion of negatively worded items serves as "cognitive speed bumps," prompting respondents to engage more thoughtfully with each question and avoid automatic or inattentive responses. Originally designed for use on construction sites in the Nordic countries, NOSACQ-50 has since been adapted for application in a range of industries and cultural contexts, where it has demonstrated strong reliability and validity as a diagnostic tool for identifying safety climate issues (Arooj *et al*., 2022). The tool has been effectively used to assess variables such as safety motivation, perceived safety levels, and self-reported safety behaviours (Yousefi *et al*., 2016). Furthermore, NOSACQ-50 has facilitated the identification of intra- and inter-organizational safety climate variations across companies, sectors, and countries (Summers, Harries and Kirby, 2022). Its global applicability is reflected in its translation into more than 45 languages and its integration into an expansive, regularly updated international benchmarking database that spans multiple industries and organizational types (Sutalaksana, Anatasia and Yassierli, 2016).

Despite these advantages, NOSACQ-50, like many safety climate instruments, presents certain limitations. Its length, 50 items spread across nine subscales, poses challenges not only in terms of administration but also in the complexity of statistical analysis and interpretation (Nielsen, Hystad and Eid, 2016). In response to these concerns, Summers, Harries, and Kirby (2022) recommend the development of a shorter, validated version for routine monitoring purposes, while retaining the full version for more detailed investigations.

Another notable limitation of NOSACQ-50 is its reliance on self-reporting, which introduces the potential for response bias. Participants may respond in a perfunctory or socially desirable manner, thereby compromising data quality (Wibowo, Lestari and Modjo, 2023). These challenges underscore the broader need for the development of concise, practical, and psychometrically sound safety climate instruments (Nielsen, Hystad and Eid, 2016; Yousefi *et al*., 2016; Summers, Harries and Kirby, 2022).

2.9.1 NOSACQ-50 items and dimensions

Safety climate is a higher order construct with several dimensions supporting it. The differences in these dimensions however vary between studies (Wibowo, Lestari and Modjo, 2023).

Safety climate is conceptualized as a higher-order construct comprising multiple interrelated dimensions, though the number and nature of these dimensions may vary across studies (Wibowo, Lestari and Modjo, 2023). NOSACQ-50 delineates seven core dimensions (Figure 3), categorized into organizational and employee domains (figure 3): (1) Management safety priority, commitment, and competence, (2) Management safety empowerment, (3) Management safety justice, (4) Workers' safety commitment, (5) Workers' safety priority and risk non-acceptance, (6) Safety communication, learning, and trust in co-workers' safety competence, and (7) Trust in the efficacy of safety systems (Sukapto *et al*., 2018).

The first three dimensions assess employee perceptions of management's safety-related behaviours and attitudes, while the remaining four focus on worker-level perceptions and practices. Items related to management are framed using "management…" statements, while items addressing the workgroup begin with "we who work here…"

Responses are captured on a four-point Likert scale ranging from "strongly disagree" to "strongly agree," requiring respondents to take a definitive stance on each item (Yousefi *et al*., 2016). Higher scores reflect more favorable safety climate perceptions. Demographic data such as age, gender, and managerial role are also collected to support contextual analysis (Kines *et al*., 2011; Yousefi *et al*., 2016; Sukapto *et al*., 2018).

According to (Summers, Harries and Kirby, 2022), dimension scores are calculated by averaging the responses to items within each dimension. These averages are then interpreted using the following criteria:

- a dimension score of 3.30 (mathematical mean) or higher indicates a good safety climate, suitable for maintaining and continuing safety efforts.

- scores from 3.00 to 3.30 suggest a fairly good safety climate, with minor areas for improvement.
- scores from 2.70 to 2.99 reflect a fairly low safety climate, requiring improvement.
- scores below 2.70 denote a poor safety climate, necessitating urgent attention.

Chapter Three: Research Methodology

3.1 Introduction

Ethical approval was sought from the University of Strathclyde's Centre of Lifelong Learning Ethics Committee (CLLEC) (Appendix 5). Participation in the research was entirely voluntary, with participants having the option to withdraw at any time. Informed consent and participant consent both provided in the local language, was obtained from the construction workers selected to participate in the research. To ensure confidentiality, research participants were instructed not to include any form of personal identification or their names on the data collection tool.

The research methodology was guided by Saunder's research onion (Saunders *et al*., 2007) as illustrated in figure 3 below. A positivist philosophical method was adopted, as it aligns favourably with the study's objectives. Peeling the next layer of the research onion, deductive approach was employed as it aligns with the traditions of quantitative research. A monomethod quantitative research strategy was selected, utilizing the safety climate survey to collect data. This methodological choice enabled systematic measurement of safety climate across the three construction sites (CS1, CS2, and CS3). An advantage of this approach is that it uses one data type to build on something that already exists. However, it may not adequately capture people's perceptions and experiences. The study adopted a cross-sectional descriptive research design, which allowed for the collection of data at a point in time.

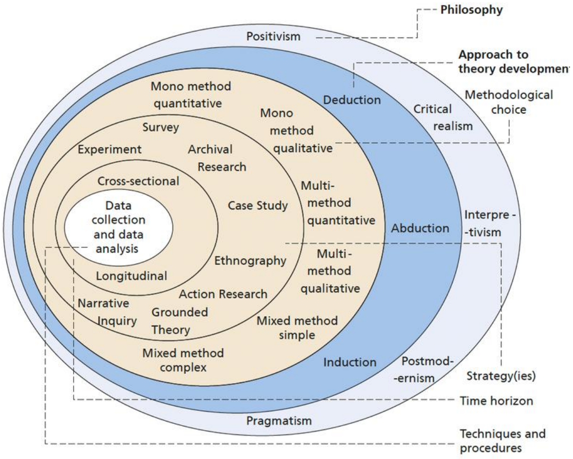

Figure 3 Research onion (Saunders et al., 2007)

3.2 Secondary Research

The secondary research aimed to meet objectives one (1) and two (2). Literature from various sources including but not limited to research journals, articles, books, reputable websites and reports were reviewed.

3.3 Primary Research

The primary research aimed to meet objectives three (3) and four (4). To meet these objectives, a cross-sectional descriptive study design was employed. This study design was useful in assessing the safety climate at construction sites in Kenya at one point in time.

3.4 Research Population

The research population consisted of construction workers employed at three construction sites (referred to in this research as CS1, CS2, and CS3) in both Nairobi City County and Kiambu County.

3.5 Research Area

The research focused on Nairobi City and Kiambu counties, purposively selected due to the rapid growth of the construction industry in the two counties compared to other counties in Kenya and in terms of the value of work done on construction of buildings (Kemei and Nyerere 2016; Kenya National Bureau of Statistics [KNBS] (2024).

3.6 Inclusion Criteria

All construction employees aged 18 years or older, employed at construction sites, and who voluntarily consent to participate were included in the research.

3.7 Exclusion Criteria

Construction employees under 18 years of age, those who decline to participate, or individuals not employed at construction sites were excluded from the research.

3.8 Variables

3.8.1 Independent variables

The independent variables for this research included sociodemographic factors (gender, age, level of education), work environment factors (work experience), and awareness of occupational injury occurrences. These variables were collected to compare safety climate scores, enrich the analysis and to fulfill objective four of this research.

3.8.2 Dependent variable

The dependent variable for this study was safety climate scores of NOSACQ-50.

3.9 Target Population and Sample Size

The target population were divided into three segments consisting of three sites: construction site 1 (CS1), construction site 2 (CS2), and construction site 3 (CS3), with each segment further divided into ‘leader’ and ‘worker’ categories (Figure 6). The term "leader" referred to those in management and senior supervisory positions. The term "worker" encompassed foremen, team leaders, and individuals from various trades, including scaffolders, masons, carpenters, painters, tilers, plumbers, electricians, fitters, welders, helpers among others.

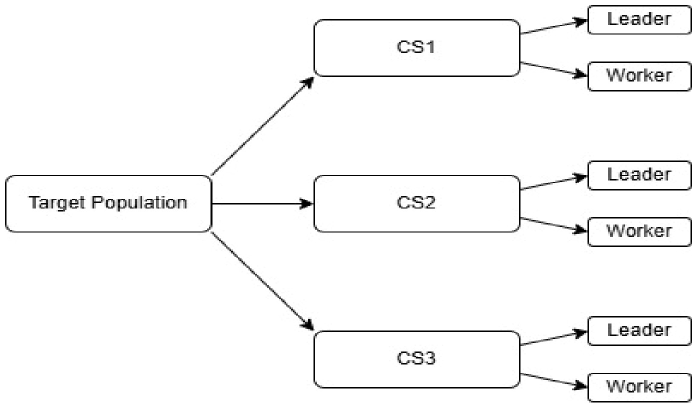

Figure 4 Breakdown of the target population (Courtesy: Collins Kamol, 2025).

Random samples were taken from each of the ‘leader’ and ‘worker’ categories of CS1, CS2, and CS3 over two weeks. At each site, five (5) leaders and 55 workers were selected. An adequate representative sample size was set at 180 (see Table 1 below).

	Number of workers in each site	Number of leaders in each site
Site 1 (CS1)	55	5
Site 2 (CS1)	55	5
Site 3 (CS3)	55	5

Table 1 Estimate of the number of participants in each site (Courtesy: Collins Kamol, 2025).

3.10 Research Instrument

3.10.1 Safety climate questionnaire

NOSACQ-50 (Kines *et al*., 2011), was used in this research. It has proven to be a reliable tool for measuring safety climate and valid for predicting safety motivation, perceived safety climate level, and self-rated safety behaviour (Kines *et al*., 2011). NOSACQ-50 was used to evaluate safety climate and collect additional data on sociodemographic factors, work experience, and awareness of occupational injury occurrences. The additional socio-demographic information also aimed to adapt NOSACQ-50 to the specific context of the construction industry and cultural aspects in Kenya. In Kenya's construction sector, there is a high demand for unskilled labour, and literacy levels was expected to vary widely. Therefore, the questionnaire was administered in the preferred language of the construction workers (either

English or Kiswahili). Participants were asked to respond based on their current construction site.

3.10.2 Distribution of questionnaires

The questionnaire was paper based, and it was administered alongside the *Information for Participants* (Appendix 2), *Consent Form* (Appendix 3) and *Privacy Notice* (Appendix 4). Participants collected questionnaires and deposited completed ones into two designated locked opaque drop boxes, located in separate areas within the onsite facilities of each construction site. To ensure transparency, dedicated boxes were used by both leaders and workers at each construction site. The boxes were regularly emptied, and the collected questionnaires were scanned and uploaded to the university secure OneDrive file store, after which paper questionnaires were shredded.

3.11 Approach to Data Analysis

Data collected from each questionnaire were entered into the NOSACQ-50 data entry form 2025 Excel spreadsheet data entry form. For each entry (respondent), identifiers such as construction site were provided.

Dimension scores and mean scores for each dimension were automatically calculated. Data collected were analyzed using SPSS version 29. Descriptive analysis for each dimension of the NOSACQ-50 was performed to describe the level and spread of safety climate scores at each construction site. Spearman's correlation analysis was employed to assess the relationship between safety climate scores (outcome variable) and independent variables (socio-demographic factors, work experience, and knowledge of occupational injury occurrence). Cronbach's alpha was performed to assess the internal consistency of each climate dimension score.

3.11.1 Interpretation and visualization of results

A simplified guide, adapted from the NOSACQ-50 website's rule of thumb, was applied to interpret the range of results. This guide served as a visual reference and assisted in contextualizing the findings (see Table 2 below).

Result range	Colour code	Rating	Action
>3.30		Good level	Maintain and continue developments.
3.00 – 3.30		Fairly good level	Slight need of improvement.
2.70 – 2.99		Fairly low level	Need of improvement.
<2.70		Low level	Great need of improvement.

Table 2 Result range, colour coding, and rating (Courtesy: Collins Kamol, 2025).

The absolute values for these aggregated means were interpreted using NOSACQ-50 guidelines for resulting actions:

- a dimension score of 3.30 (mathematical mean) or higher indicate a good safety climate, suitable for maintaining and continuing safety efforts.
- scores from 3.00 to 3.30 suggest a fairly good safety climate, with minor areas for improvement.
- scores from 2.70 to 2.99 reflect a fairly low safety climate, requiring improvement.
- scores below 2.70 denote a poor safety climate, necessitating urgent attention.

3.12 Limitations of the study

1. The research was limited to construction workers employed at construction sites in Nairobi City County and Kiambu County. As a result, the findings may only be reasonably generalized to similar contexts and may not fully represent construction workers in other counties.
2. The presence of missing gender data at CS2 and CS3 highlighted the occasional incompleteness of self-reported demographic information in field-based research.

Chapter Four: Results

The results were presented in the form of tables, graphs, and figures and discussed according to the research objectives.

4.1 Distribution of participants by worker type (workers and leaders)

Figure 5 below illustrates the distribution of participants by worker type (leaders and workers).

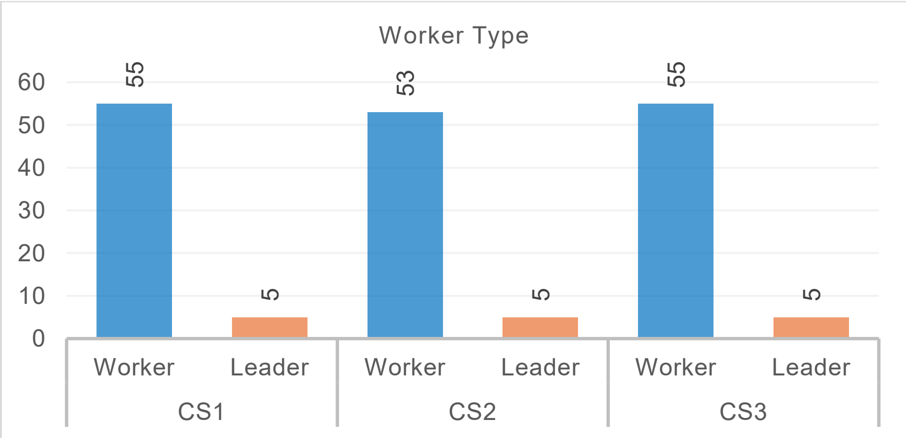

Figure 5 Distribution of participants by worker type (workers and leaders)

At CS1, a total of 60 participants participated in the research. A similar scenario was observed at CS3. However, at CS2, although 60 individuals participated, only 58 questionnaires were correctly completed, resulting in the exclusion of two responses from the final analysis.

4.2 Socio-demographic characteristics of participants

Figures 6 through 8 present the socio-demographic characteristics of participants across the three construction sites.

Figure 6 below illustrates the gender distribution of participants. At CS1, the majority of respondents were male (n=55), while female participants accounted for only 5 of the total responses. At CS2, 49 participants identified as male and 9 as female. Similarly, at CS3, 53 respondents were male and 6 were female, while 1 participant did not provide gender information.

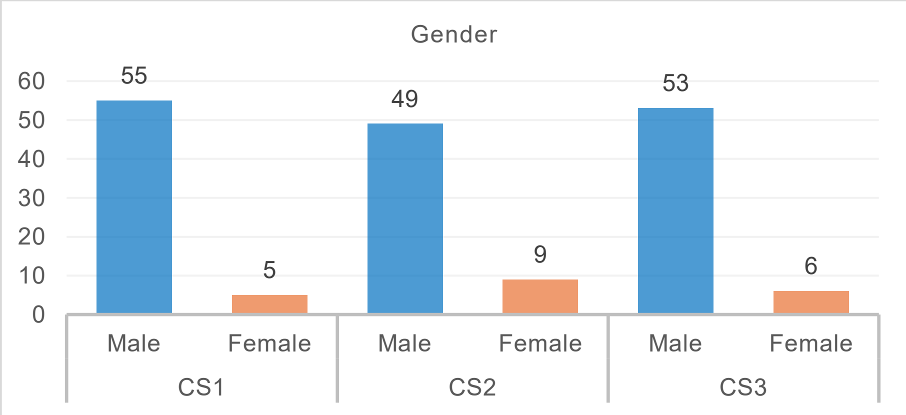

Figure 6 Distribution of participants by gender

Figure 7 below presents the age distribution of participants. Results showed that the majority of participants at all sites fell within the 18–30 years age category, representing 43 participants at CS1, 33 at CS2, and 45 at CS3. At CS1, 11 participants were aged between 30–40 years, and 5 were over 40 years. Similarly, at CS2, 22 participants were aged between 30–40 years, and 3 were over 40 years. At CS3, 11 participants were aged 30–40 years, while 4 were over 40 years.

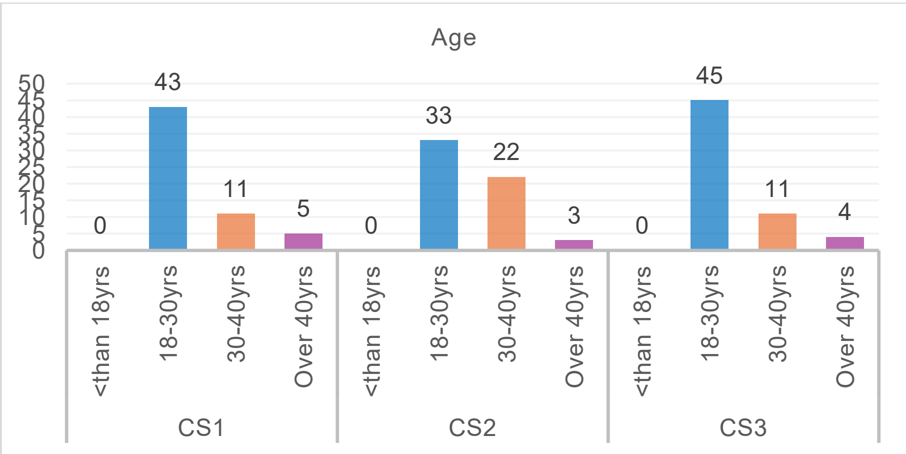

Figure 7 Distribution of participants by age

Figure 8 below presents the distribution of participants' educational attainment. At CS1, the majority of participants (n=32) reported having attained secondary or high school education. This was followed by 15 participants with tertiary or university education, 9 with primary education, and 1 participant with no formal education. At CS2, 28 participants reported having completed secondary or high school education, while 23 had attained tertiary or university qualifications. Five participants indicated primary education as their highest level, and 2 participants reported having no formal education. At CS3, the majority of participants (n=39) had attained tertiary or university education, followed by 20 participants who had completed secondary or high school. Notably, no participants in CS3 reported having only primary education or no education.

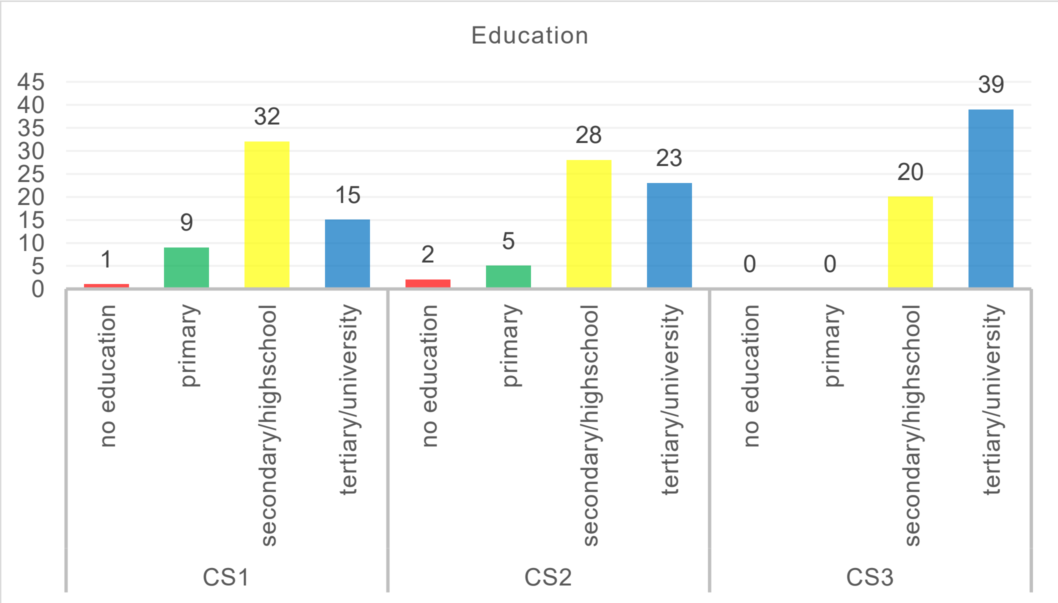

Figure 8 Distribution of participants by education level

4.3 Work environment factors (work experience)

Figure 9 below illustrates the distribution of participants' work experience, categorized into four groups: less than 1 year, 1–3 years, 3–5 years, and over 5 years. At CS1, the distribution of participants was relatively balanced across three experience categories. Only a few participants (n=9) reported having 3–5 years of experience. At CS2, the largest proportion of participants (n=28) had less than 1 year of experience. This was followed by 17 participants with over 5 years of experience, 9 participants with 1–3 years of experience, and 4 participants in the 3–5 years category. At CS3, most participants reported having 1–3 years of experience (n=19). This was followed by 16, and 15 participants each in the over 5 years and 3–5 years categories respectively. The smallest group comprised participants with less than 1 year of experience (n=9).

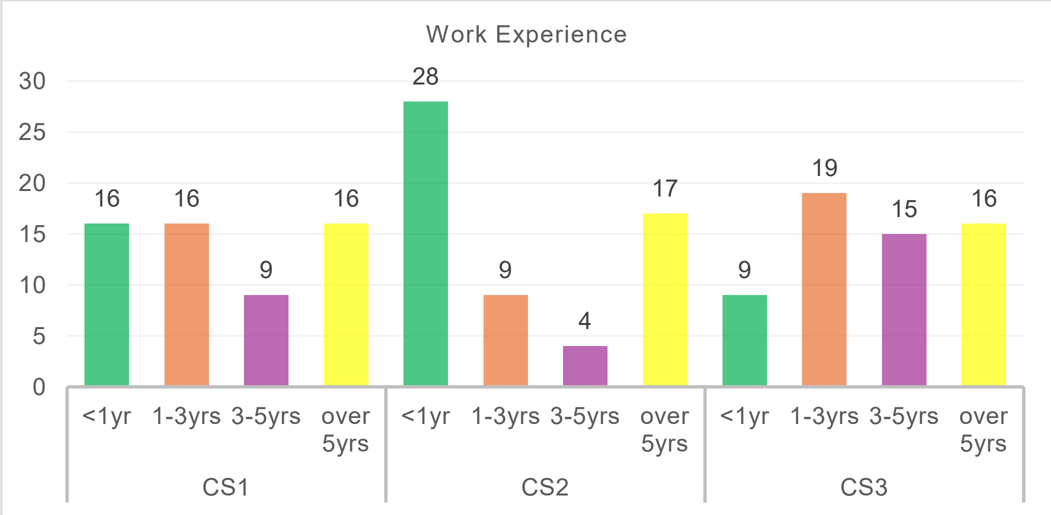

Figure 9 Distribution of participants by work experience

4.4 Knowledge of occupational injury occurrence

Participants were asked whether they had knowledge of any injury that had occurred at their workplace in the past twelve months, with responses categorized as ‘Yes’ or ‘No.’ At CS1, responses were nearly evenly split, with 26 participants (43.3%) indicating awareness of an occupational injury and 30 participants (50%) reporting no such knowledge. At CS2, a greater proportion (33) (56.9%) of participants reported knowledge of occupational injuries, while 25 participants (43.1%) indicated no awareness. CS3 had the highest number of participants (n=37) reporting no knowledge of occupational injuries, while only 23 participants (38.3%) affirmed awareness.

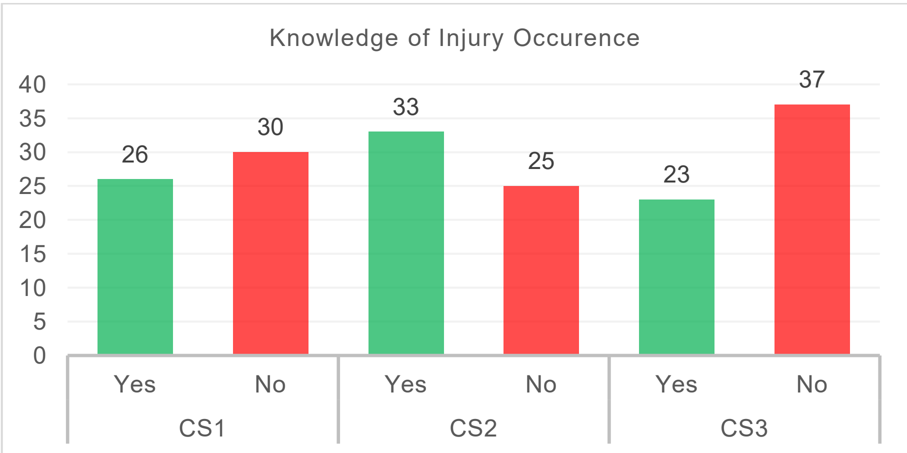

Figure 10 Distribution of participants by knowledge of injury

4.5 Safety climate dimension scores

Figure 11 below represents the safety climate dimension scores across the three construction sites (CS1, CS2, and CS3). The absolute values for the aggregated means for each site were interpreted using NOSACQ-50 guidelines.

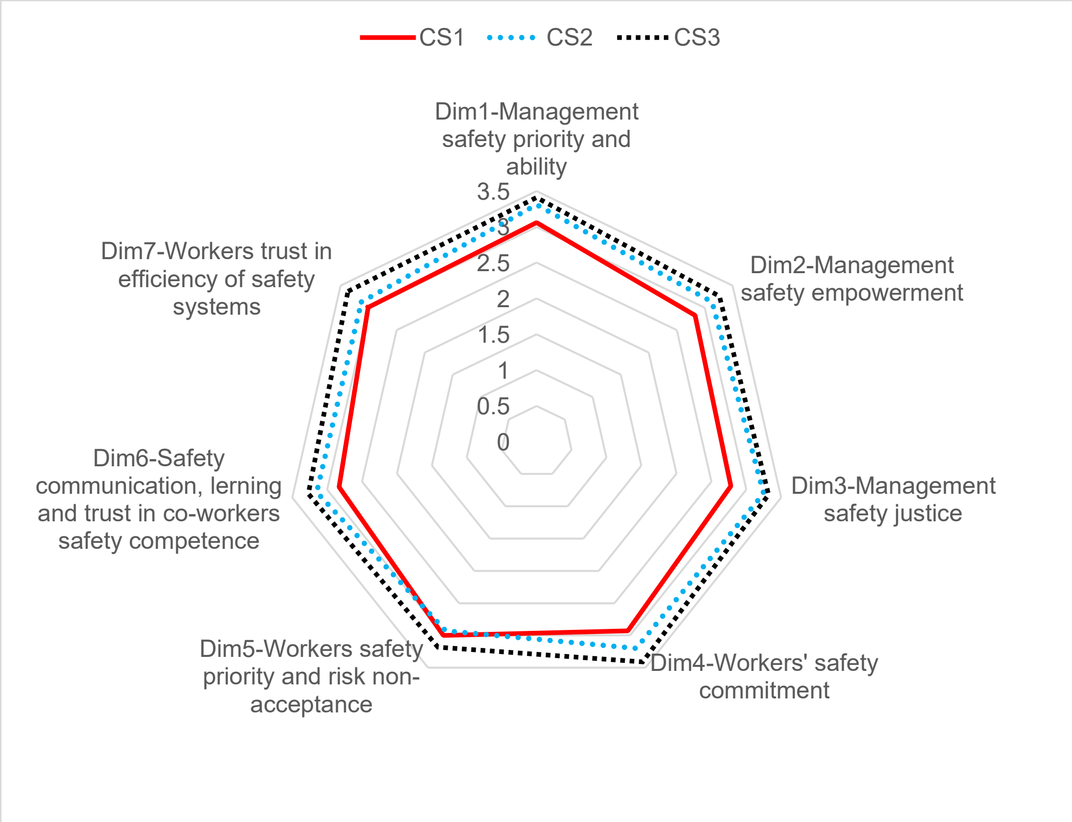

Figure 11 Safety Climate Dimension Scores (radar chart)

Figure 12 below presents the same data as depicted in Figure 11. However, it includes the specific numerical values associated with each safety climate dimension, thereby offering a more detailed quantitative representation of the results.

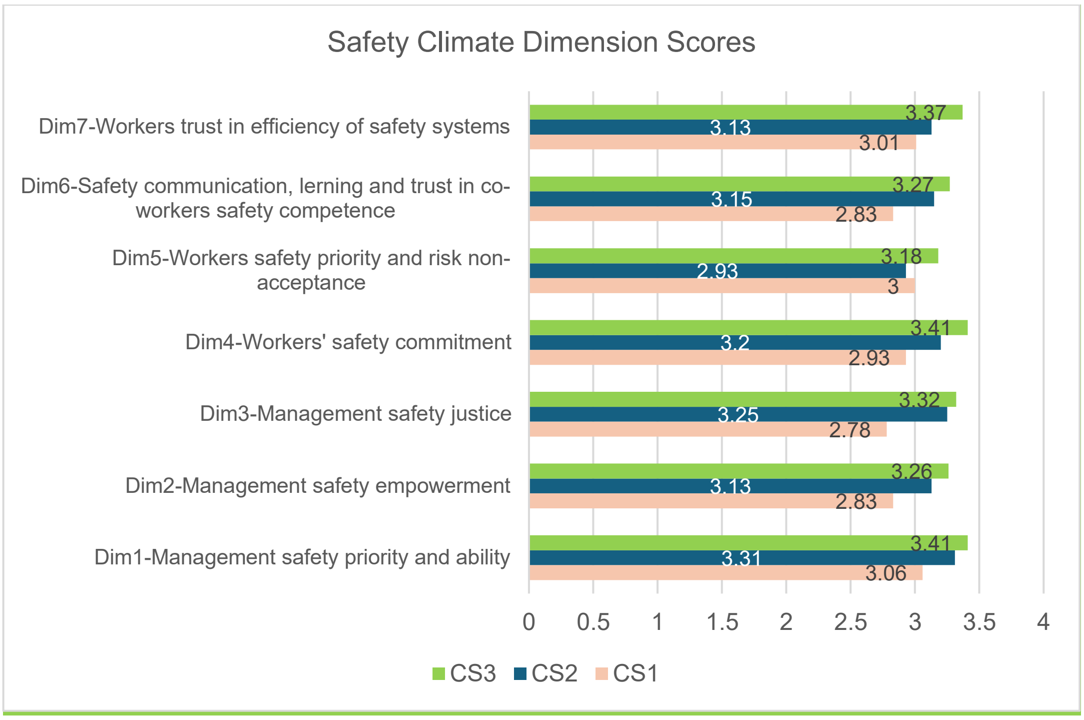

Figure 12 Safety Climate Dimension Scores (bar chart)

4.6 Interpretation of Safety Climate Dimension Scores

A simplified guide, adapted from the NOSACQ-50 website's rule of thumb, was applied to interpret the range of results.

Result range	Colour code	Rating	Action required
>3.30		Good level	Maintain and continue developments.
3.00 – 3.30		Fairly good level	Slight need of improvement.
2.70 – 2.99		Fairly low level	Need of improvement.
<2.70		Low level	Great need of improvement.

Table 3 NOSACQ-50 colour coded score range.

Dimensions	CS1 Mean	CS2 Mean	CS3 Mean
Dim1-Management safety priority and ability	3,06	3,31	3,41
Dim2-Management safety empowerment	2,83	3,13	3,26
Dim3-Management safety justice	2,78	3,25	3,32
Dim4-Workers' safety commitment	2,93	3,2	3,41
Dim5-Workers' safety priority and risk non-acceptance	3.0	2,93	3,18
Dim6-Safety communication, learning and trust in co-workers' safety competence	2,83	3,15	3,27
Dim7-Workers trust in efficiency of safety systems	3,01	3,13	3,37

Table 4 Safety climate mean scores.

Twenty-one (21) safety climate dimension scores comprising seven dimensions assessed across three sites (CS1, CS2, and CS3) were evaluated. Of these, four (4) dimensions were classified as indicating a ‘good’ safety climate, suggesting that the current level should be maintained. Twelve (12) dimensions were interpreted as ‘fairly good’ indicating a need for slight improvement. The remaining 5 (five) dimensions were assessed as ‘fairly low’, highlighting areas that require improvement.

4.6.1 CS1 Safety Climate Dimension Scores

Dimensions	CS1 Overall Mean	Worker Mean	Worker Std. Deviation	CS1 Leader Mean	Leader Std. Deviation
Dim1	3.06	3.05	0.49	3.28	0.57
Dim2	2.83	2.84	0.50	2.65	0.89
Dim3	2.78	2.76	0.59	3.07	0.42
Dim4	2.93	2.90	0.53	3.27	0.48
Dim5	3.0	2.98	0.48	3.20	0.60
Dim6	2.83	2.81	0.60	2.97	0.65
Dim7	3.01	2.98	0.51	3.31	0.54

Dimension 1-Management safety priority and ability

This dimension was consistently rated as *fairly good* by both workers and leaders.

Dimension 2-Management safety empowerment

This dimension revealed the lowest leader rating (2.65), indicating a *low level* (<2.70) of perceived management empowerment regarding safety. Workers rated it slightly higher (2.84), but still within the *fairly low* range.

Dimension 3-Management safety justice

There is a perceptual disparity between leaders (3.07) and workers (2.76) regarding fairness in safety-related decisions.

Dimension 4-Workers' safety commitment

Similar to Dimension 3, leaders perceived higher levels of worker commitment (3.27) to safety, while workers rated this lower (2.90).

Dimension 5-Workers’ safety priority and risk non-acceptance

The leader means (3.20) fell within the *fairly good* category, while the worker mean (2.98) was just below the threshold.

Dimension 6-Safety communication, learning and trust in co-workers' safety competence

Both leaders (2.97) and workers (2.81) rated this dimension almost similarly.

Dimension 7-Workers trust in efficiency of safety systems

Leaders rated this dimension at a *good* level (3.31), while workers rated it just below the fairly good (2.98) threshold.

4.6.2 CS2 Safety Climate Dimension Scores

Dimensions	CS2 Overall Mean	Worker Mean	Worker Std. Deviation	CS2 Leader Mean	Leader Std. Deviation
Dim1	3.31	3.30	0.45	3.48	0.17
Dim2	3.13	3.13	0.51	3.12	0.12
Dim3	3.25	3.23	0.41	3.39	0.33
Dim4	3.20	3.18	0.53	3.43	0.51
Dim5	2.93	2.89	0.51	3.34	0.44
Dim6	3.15	3.14	0.42	3.30	0.26
Dim7	3.13	3.11	0.49	3.34	0.31

Dimension 1-Management safety priority and ability

This dimension reflects a strong perception of safety prioritization by management, particularly among leaders. Workers also rated (3.30) it positively.

Dimension 2-Management safety empowerment

Perceptions of empowerment was consistent and moderately positive across both groups.

Dimension 3-Management safety justice

Leaders rated (3.39) management fairness more positively than workers (3.23), though both groups rated it within the fairly good to good range.

Dimension 4-Workers' safety commitment

Leaders again rated (3.43) this dimension more highly than workers (3.18).

Dimension 5-Workers' safety priority and risk non-acceptance

Leaders (3.34) perceived high worker prioritization of safety and risk aversion, while workers rated themselves lower (2.89).

Dimension 6-Safety communication, learning and trust in co-workers' safety competence

Both leaders (3.30) and workers (3.14) rated this dimension within the fairly good range.

Dimension 7-Workers trust in efficiency of safety systems

While leaders expressed greater (3.34) confidence in the safety systems in place, workers still viewed them favourably (3.11).

4.6.3 CS3 Safety Climate Dimension Scores

Dimensions	CS3 Overall Mean	Worker Mean	Worker Std. Deviation	CS3 Leader Mean	Leader Std. Deviation
Dim1	3.41	3.40	0.43	3.51	0.47
Dim2	3.26	3.27	0.37	3.19	0.40
Dim3	3.32	3.33	0.51	3.20	0.77
Dim4	3.41	3.43	0.43	3.20	0.54
Dim5	3.18	3.19	0.41	3.03	0.40
Dim6	3.27	3.27	0.41	3.23	0.50
Dim7	3.37	3.36	0.47	3.54	0.37

Dimension 1-Management safety priority and ability

There was a strong safety climate perception across both workers (3.40) and leaders (3.51).

Dimension 2-Management safety empowerment

Although slightly (3.27) below the “good” threshold, perceptions of empowerment and worker participation were consistently positive.

Dimension 3-Management safety justice

Workers reported higher levels (3.33) of perceived fairness in how management treats workers involved in accidents compared to leaders (3.20).

Dimension 4-Workers' safety commitment

Workers’ self-assessment of safety commitment, promotion and care for each other’s safety was notably high (3.43), while leaders offered a slightly lower (3.20) but still favorable assessment.

Dimension 5-Workers’ safety priority and risk non-acceptance

Both workers (3.19) and leaders (3.03) rated this dimension within the fairly good range.

Dimension 6-Safety communication, learning and trust in co-workers’ safety competence

Consistent scores were observed for both workers (3.27) and leaders (3.23).

Dimension 7-Workers trust in efficiency of safety systems

Both workers (3.36) and leaders (3.54) expressed high confidence in the reliability of existing safety systems.

4.7 Relationship between socio-demographic factors and safety climate

Table 5 CS1: correlation between gender, age and education with safety climate.

	Gender	Age	Education
Dim1-Management safety priority and ability	-0.060	0.167	0.009
	0.650	0.211	0.950
Dim2-Management safety empowerment	-0.011	0.102	0.051
	0.931	0.444	0.706
Dim3-Management safety justice	-0.105	0.179	0.258
	0.423	0.176	0.053
Dim4-Workers' safety commitment	-0.047	.294*	0.193
	0.724	0.025	0.154
Dim5-Workers' safety priority and risk non-acceptance	-0.059	0.091	0.085
	0.652	0.495	0.531
Dim6-Safety communication, learning, and trust in co-workers' safety competence	0.063	.299*	0.130
	0.633	0.022	0.335
Dim7-Workers trust in the efficiency of safety systems	0.063	0.194	0.171
	0.631	0.141	0.204

*Correlation is significant at $p<0.05$

CS1: Gender and safety climate

Table 5 above shows that there was no significant association between gender and any of the dimension scores. There was however weak negative correlation between dimension 3 and gender (r=-0.105, *p*=.423).

CS1: Age and safety climate

Age demonstrated statistically significant relationship with dimension 4 (r=0.29, *p*=.025) and dimension 6 (r=0.299, *p*=.022).

CS1: Education level and safety climate

There was no statistically significant correlation between level of education and any of the safety climate dimensions.

Table 6 CS2: Correlation between gender, age and education with safety climate.

	Gender	Age	Education
Dim1-Management safety priority and ability	-0.266	-0.166	0.164
	0.046*	0.218	0.223
Dim2-Management safety empowerment	-0.090	-0.140	-0.010
	0.504	0.300	0.939
Dim3-Management safety justice	0.052	-0.232	-0.095
	0.698	0.080	0.480
Dim4-Workers' safety commitment	-0.223	-0.075	0.000
	0.095	0.577	1.000
Dim5-Workers' safety priority and risk non-	-0.195	-0.116	0.026
acceptance	0.143	0.384	0.844
Dim6-Safety communication, learning, and trust in	0.059	0.033	-0.036
co-workers' safety competence	0.662	0.808	0.788
Dim7-Workers trust in the efficiency of safety	-0.115	-0.025	0.100
systems	0.395	0.855	0.458

*Correlation is significant at $p<0.05$

CS2: Gender and safety climate

Table 6 above demonstrates that gender was significantly negatively correlated with dimension 1 (r=-0.0266, p=.046). No statistically significant relationships were observed between gender and other dimensions.

CS2: Age and safety climate

There was no statistically significant correlation between age and any of the safety climate dimensions.

CS2: Education level and safety climate

There was no significant relationship between level of education and any of the safety climate dimensions.

Table 7 CS3: Correlation between gender, age and education with safety climate.

	Gender	Age	Education
Dim1-Management safety priority and ability	0.014	0.196	0.416
	0.916	0.134	0.001
Dim2-Management safety empowerment	0.003	0.049	0.347
	0.979	0.709	0.007
Dim3-Management safety justice	0.017	0.193	0.387
	0.900	0.140	0.002*
Dim4-Workers' safety commitment	0.102	-0.020	0.463
	0.443	0.882	0.000*
Dim5-Workers' safety priority and risk non-acceptance	0.148	0.099	.295*
	0.265	0.453	0.023
Dim6-Safety communication, learning, and trust in co-workers' safety competence	0.229	-0.140	0.412
	0.081	0.286	0.001
Dim7-Workers trust in the efficiency of safety systems	0.187	0.147	0.486
	0.157	0.262	0.000

*Correlation is significant at $p<0.05$

CS3: Gender and safety climate

Table 7 above shows that gender did not demonstrate statistically significant correlations with any of the safety climate dimensions $p>0.05$.

CS3: Age and safety climate

Age did not demonstrate statistically significant correlations with any of the safety climate dimensions $p>0.05$.

CS3: Education level and safety climate

Education was positively linked to more dimensions. Strongest associations were observed with dimension 3 (r = 0.387, p =.002), dimension 4 (r = 0.463, *p*= 0.001), dimension 7 (r=0.486, *p*= 0.001), and dimension 6 (r= 0.412, *p*=0.001).

4.8 Relationship between work experience and safety climate

4.8.1 Work experience and safety climate (CS1)

Table 8 below shows the results of Spearman's rank-order correlation analysis examining the relationship between work experience and safety climate dimensions at CS1.

Table 8 CS1: Correlation between work experience with safety climate.

Dim1-Management safety priority and ability	-0.036
	0.793
Dim2-Management safety empowerment	-0.011
	0.938
Dim3-Management safety justice	0.069
	0.610
Dim4-Workers' safety commitment	0.151
	0.267
Dim5-Workers' safety priority and risk non-acceptance	0.036
	0.793
Dim6-Safety communication, learning, and trust in co-workers' safety competence	0.180
	0.180
Dim7-Workers trust in the efficiency of safety systems	0.009
	0.947

*Correlation is significant at $p<0.05$

There was no significant ($p>0.05$) relationship between work experience and safety climate dimensions.

4.8.2 Work experience and safety climate (CS2)

Table 9 CS2: Correlation between work experience with safety climate.

Dim1-Management safety priority and ability	-0.132
	0.326
Dim2-Management safety empowerment	-0.215
	0.108
Dim3-Management safety justice	-0.225
	0.089
Dim4-Workers' safety commitment	-0.028
	0.837
Dim5-Workers' safety priority and risk non-acceptance	0.029
	0.827
Dim6-Safety communication, learning, and trust in co-workers' safety competence	-0.035
	0.793
Dim7-Workers trust in the efficiency of safety systems	0.083
	0.538

*Correlation is significant at $p<0.05$

There was no significant ($p>0.05$) relationship between work experience and safety climate dimensions at CS2.

4.8.3 Work experience and safety climate (CS3)

Table 10 CS3: Correlation between work experience with safety climate.

Dim1-Management safety priority and ability	-0.003
	0.984
Dim2-Management safety empowerment	-0.059
	0.655
Dim3-Management safety justice	0.085
	0.522
Dim4-Workers' safety commitment	-0.035
	0.794
Dim5-Workers' safety priority and risk non-acceptance	-0.033
	0.803
Dim6-Safety communication, learning, and trust in co-workers' safety competence	-0.193
	0.143
Dim7-Workers trust in the efficiency of safety systems	-0.002
	0.987

*Correlation is significant at $p<0.05$

There was no significant ($p>0.05$) relationship between work experience and safety climate dimensions at CS3.

4.9 Relationship between knowledge of occupational injury occurrence and safety climate

4.9.1 Knowledge of injury occurrence and safety climate (CS1)

Table 11 CS1: Correlation between knowledge of injury occurrence with safety climate

Dim1-Management safety priority and ability	-0.024
	0.864
Dim2-Management safety empowerment	-0.257
	0.006*
Dim3-Management safety justice	-0.065
	0.633
Dim4-Worker's safety commitment	0.080
	0.560
Dim5-Workers' safety priority and risk non-acceptance	-0.136
	0.318
Dim6-Safety communication, learning, and trust in co-workers' safety competence	0.107
	0.434
Dim7-Workers trust in efficiency of safety systems efficacy of safety systems	-0.079
	0.563

*Correlation is significant at $p<0.05$

Table 11 above shows that at CS1, only dimension 2 (r=-0.257, *p*=.006) was significant.

4.9.2 Knowledge of injury occurrence and safety climate (CS2)

Table 12 CS2: Correlation between knowledge of injury occurrence with safety climate

Dim1-Management safety priority and ability	-0.137
	0.310
Dim2-Management safety empowerment	-0.153
	0.255
Dim3-Management safety justice	-0.005
	0.968
Dim4-Worker's safety commitment	-0.242
	0.070
Dim5-Workers' safety priority and risk non-acceptance	-0.147
	0.272
Dim6-Safety communication, learning, and trust in co-workers' safety	-0.073
competence	0.586
Dim7 - Workers trust in efficiency of safety systems efficacy of safety	-0.241
systems	0.070

*Correlation is significant at $p<0.05$

Table 12 above shows that there was no significant ($p>0.05$) relationship between knowledge of injury occurrence and safety climate dimensions at CS2. However, dimension 4 was close to $p<0.05$.

4.9.3 Knowledge of injury occurrence and safety climate (CS3)

Table 13 CS3: Correlation between knowledge of injury occurrence with safety climate

Dim1-Management safety priority and ability	0.056
	0.670
Dim2- Management safety empowerment	-0.043
	0.745
Dim3-Management safety justice	0.112
	0.393
Dim4-Worker's safety commitment	0.035
	0.791
Dim5-Workers' safety priority and risk non-acceptance	-0.011
	0.936
Dim6 - Safety communication, learning, and trust in co-workers' safety	-0.127
competence	0.333
Dim6-Safety communication, learning, and trust in co-workers' safety	-0.224
competence	0.085

*Correlation is significant at $p<0.05$

Table 13 above shows that there was no significant ($p>0.05$) relationship between knowledge of injury occurrence and safety climate dimensions at CS3.

4.10 Reliability of results

Cronbach's alpha was performed to assess the internal consistency of each climate dimension score across the three construction sites (CS1, CS2, and CS3). George and Mallery (2003) suggested a tiered approach to Cronbach's alpha values consisting of:

- ≥ .9 – Excellent
- ≥ .8 – Good
- ≥ .7 – Acceptable
- ≥ .6 – Questionable
- ≥ .5 – Poor
- ≤ .5 – Unacceptable

Dimensions	**Mean**	**Std. Deviation**	**Variance**	**Cronbach's Alpha**
Dim1	3.05	0.49	0.24	0.824
Dim2	2.84	0.50	0.25	0.835
Dim3	2.76	0.59	0.35	0.744
Dim4	2.90	0.53	0.28	0.676*
Dim5	2.98	0.48	0.23	0.700
Dim6	2.81	0.60	0.36	0.890
Dim7	2.98	0.51	0.26	0.769

CS1 Reliability test (workers)

At CS1, workers' reliability tests indicated that dimensions 1, 2,3,5,6, and 7 have a good (≥ .7) internal consistency.

Dimensions	**Mean**	**Std. Deviation**	**Variance**	**Cronbach's Alpha**
Dim1	3.28	0.57	0.32	0.928
Dim2	2.65	0.89	0.78	0.825
Dim3	3.07	0.42	0.17	0.926
Dim4	3.27	0.48	0.23	0.800
Dim5	3.20	0.60	0.36	0.850
Dim6	2.97	0.65	0.43	0.724
Dim7	3.31	0.54	0.29	0.667*

CS1 Reliability test (leaders)

At CS1, leader's internal consistency was good (≥ .7) for all dimensions apart from dimension 7.

Dimensions	Mean	Std. Deviation	Variance	Cronbach's Alpha
Dim1	3.30	0.45	0.20	0.612
Dim2	3.13	0.51	0.26	0.703
Dim3	3.23	0.41	0.17	0.461*
Dim4	3.18	0.53	0.28	0.309*
Dim5	2.89	0.51	0.26	0.643
Dim6	3.14	0.42	0.17	0.781
Dim7	3.11	0.49	0.24	0.702

CS2 Reliability test (Workers)

At CS2, workers' reliability tests were relatively low (≤ .5) for dimensions 3 and 4, which is unacceptable.

Dimensions	Mean	Std. Deviation	Variance	Cronbach's Alpha
Dim1	3.48	0.17	0.03	0.800
Dim2	3.12	0.12	0.02	0.915
Dim3	3.39	0.33	0.11	0.600
Dim4	3.43	0.51	0.26	0.852
Dim5	3.34	0.44	0.19	0.750
Dim6	3.30	0.26	0.07	0.881
Dim7	3.34	0.31	0.09	0.738

CS2 Reliability test (Leaders)

At CS2, the leader's internal consistency was generally perfect across all dimensions. This means that items measured a common underlying construct.

Dimensions	Mean	Std. Deviation	Variance	Cronbach's Alpha
Dim1	3.40	0.43	0.18	0.783
Dim2	3.27	0.37	0.14	0.658
Dim3	3.33	0.51	0.26	0.822
Dim4	3.43	0.43	0.19	0.765
Dim5	3.19	0.41	0.17	0.652
Dim6	3.27	0.41	0.17	0.799
Dim7	3.36	0.47	0.22	0.756

CS3 Reliability test (Workers)

At CS3, values were above (.6), indicating that there is a good internal consistency in workers' items and that items within the scale measure a common construct.

Dimensions	**Mean**	**Std. Deviation**	**Variance**	**Cronbach's Alpha**
Dim1	3.51	0.47	0.22	0.702
Dim2	3.19	0.40	0.16	0.872
Dim3	3.20	0.77	0.59	1.000
Dim4	3.20	0.54	0.29	0.907
Dim5	3.03	0.40	0.16	0.850
Dim6	3.23	0.50	0.25	0.896
Dim7	3.54	0.37	0.13	0.952

CS3 Reliability test (Leaders)

At CS3, the leaders' values had a good internal consistency. This means that items within the scales measured a common underlying construct across different dimensions.

Chapter Five: Discussion

This chapter brings together the primary research findings and relates them to the Significant factors (SFs) and industry backdrop.

5.1 Socio-demographic characteristics of participants

In this research, there was a pronounced gender imbalance across all sites, with male participants comprising the vast majority. Across the three construction sites, male (n=157) respondents were significantly more than females (n=20). A similar study in China across construction sites (Choudhry, Fang and Lingard, 2009) revealed that 97.3% of the participants were males with females accounting for only 2.7%. Possible explanation for this could be that construction is predominantly male dominated field involving repeated physical activities such as heavy lifting and carrying (da Costa-Machado *et al*., 2024).

The proportion of workers aged over 40 was relatively low (12). These findings underscore the predominance of younger workers within the construction sector and reflect the broader labour trends across the African construction industry, that employs a younger labour force for physically demanding roles (Windapo, 2016). However, these results contrast with findings from previous studies. For instance, Alamoudi (2022) reported that the majority of participants were aged between 31–40 years, accounting for (n=119; 40.2%) of the sample, while Seung-Yong *et al*. (2017) observed that workers aged 40–49 years constituted the largest proportion (n=21; 42%). This discrepancy highlights possible regional or contextual variations in workforce age distribution across construction settings.

This research demonstrated that across all the three sites, secondary/high school (n=80) and tertiary/university education (n=77) were the most common levels of educational attainment. A minimal number of participants reported no formal education (n=3), and only a small proportion had completed only primary education (n=14). These results are consistent with the findings reported in a study by Nadhim *et al*. (2018) that revealed that respondents who had attained high school level of education were the majority (41.7%).

These findings suggest a relatively educated workforce across the sampled construction sites, which may have implications for safety training and understanding of safety instructions. In other words, the one's education level can positively influence how well they learn, retain, and apply safe work behaviours, and practices (Burke *et al*., 2006).

5.2 Work environment factors (work experience)

There was considerable variability in work experience among workers across the three sites. CS2 had a higher proportion of workers with less than one year of experience, whereas CS3 demonstrated a more balanced distribution across all experience categories, with a slight concentration in the 1–3 years range. These findings are, however, different from another study (Alamoudi (2022) that found that the majority of construction workers (n=97) had between 3-5 years of experience. Another study by Ademola (2020) observed that 40.91% of the respondents (n=99) reported having 6-10 years of professional experience. This variation in experience levels across sites may have important implications for training needs (Burke *et al*., 2006), and safety culture assimilation. Inexperienced workers are also more likely to underestimate risks or fail to recognize obvious occupational hazards as they are still in the learning stages of their profession and are finding ways to cope with the physical job demands (Chan *et al*., 2023).

5.3 Knowledge of occupational injury occurrence

These findings indicate notable variability in the awareness of occupational injuries across the construction sites. CS3 exhibited the lowest level of injury awareness among workers, which may be indicative of underreporting, limited communication regarding safety incidents, or reduced worker engagement with workplace safety protocols. In contrast, CS2 recorded the highest proportion of workers who reported awareness of injuries (n=33), suggesting the presence of more transparent worker engagement and communication practices at that site. These findings contrast with those of Berhanu, Gebrehiwot, and Gizaw (2019), whose study among construction workers in Ethiopia revealed that the majority of participants (n=497; 87.2%) were aware of occupational hazards. Such discrepancies may be attributed to contextual differences in study settings, variations in working conditions, the effectiveness of accident prevention strategies, and the influence of socio-cultural environments.

5.4 Safety climate dimension scores

CS1 demonstrated the lowest safety climate scores across all dimensions, particularly in Dim3 (2.78) and Dim2 (2.83). All dimension scores for CS1 fall below 3.06, placing them in the *fairly low* safety climate level (2.70-2.99). This implies considerable room for improvement in both management-led and worker-led safety constructs. CS2 exhibits a mixed profile, with scores for Dim1, Dim2, Dim3, Dim6, and Dim7 falling within the *good* range (≥ 3.13), but Dim5 (2.93) lies just below the threshold, indicating moderate concern in risk tolerance attitudes. CS3 consistently outperforms CS1 and CS2 across all dimensions, with all scores exceeding 3.18 and most surpassing the 3.30 threshold, denoting a strong and positive safety climate. Notably, CS3 scores particularly high in Dim4 (3.41) and Dim7 (3.37), reflecting both managerial support and worker confidence in safety measures. The scores for CS2 compare well with the findings reported in a study in Italy by Fargnoli and Lombardi (2020).

5.4.1 Safety climate dimension scores for workers and leaders

Compared to the other construction sites, CS3 demonstrated the strongest and most consistent safety climate across both worker and leadership perspectives. Notably, workers at CS3 generally provided higher or equivalent scores compared to leaders, an encouraging indicator of worker engagement and confidence in the safety culture.

Dimension 1-Management safety priority and ability

At CS1, the mean score reported by leaders was 3.28 (SD=0.57), compared to (3.05, SD=0.49) for workers, suggesting that leaders perceived management’s commitment and competence more positively than workers. A similar scenario was observed at CS2, workers rated this dimension at 3.30 (SD=0.45), while leaders rated it slightly higher at (3.48, SD=0.17). In contrast, at CS3, the scores were closely similar between workers (3.40, SD=0.43) and leaders (3.51, SD=0.47), indicating a shared and consistently strong confidence in management's prioritization of safety and its competence in promoting a safe working environment.

Dimension 2-Management safety empowerment

At CS3, worker and leader ratings were closely aligned (3.27, SD=0.37) and (3.19, SD=0.40), indicating a shared perception of management's efforts to involve and empower staff in safety-related matters. A similar scenario was observed at CS2, where both workers and leaders provided nearly identical ratings of (3.13, SD=0.51) and (3.12, SD=0.12) respectively. These findings suggest a general recognition of management's commitment to safety empowerment across both sites, while also indicating room for marginal improvement. CS1, however, reported lowest scores, with workers assigning a mean rating of (2.84, SD=0.50) and leaders (2.65, SD=0.89) highlighting comparatively weaker perceptions of management safety empowerment relative to CS2 and CS3.

Dimension 3-Management safety justice

At CS1, leaders reported a higher mean score (3.07, SD=0.42) compared to workers (2.76, SD=0.59). This discrepancy suggests a potential divergence in perceptions regarding the fairness and consistency of management's safety-related decisions and disciplinary actions, with workers possibly perceiving inequities in their application. In contrast, both CS2 and CS3 demonstrated high and relatively similar ratings from both workers and leaders, reflecting a strong shared perception of fairness in the way management treats those involved in accidents.

Dimension 4-Workers' safety commitment

At both CS1 and CS2, leaders reported higher mean scores (3.27, SD=0.48) and (3.43, SD=0.51) respectively compared to workers. This disparity may indicate that leaders perceive the workforce to be more committed to safety and less accepting of risk than workers perceive themselves or their colleagues. Conversely, at CS3, workers reported a higher mean score (3.43, SD=0.43) than leaders (3.20, SD=0.54), suggesting a strong sense of safety commitment and mutual concern for co-worker well-being.

Dimension 5-Workers' safety priority and risk non-acceptance

At CS3, the mean score reported by workers (3.19) exceeded that of leaders (3.03), indicating that workers may place greater emphasis on safety and exhibit lower tolerance for risk than perceived by leaders. In contrast, at CS2, leaders rated this dimension significantly higher (3.34, SD=0.44) compared to workers (2.89, SD=0.51). A similar pattern was observed at CS1, where leaders reported a higher score (3.20, SD=0.60) than workers (2.98, SD=0.48). These scores at CS1 and CS2 may reflect a potential overestimation by management of workers' prioritization of safety and aversion to risk-taking behaviours.

Dimension 6-Safety communication, learning and trust in co-workers' safety competence

Similar to CS3, where worker (3.27, SD=0.41) and leader (3.23, SD=0.50) scores were closely similar, CS2 also demonstrated comparable perceptions between the two groups, with workers reporting a mean score of 3.14 (SD=0.42) and leaders rating the dimension slightly higher (3.30, SD=0.26). In contrast, at CS1, although leaders reported a slightly higher score (2.97, SD=0.65) than workers (2.81, SD=0.60), both scores remained within the 'fairly low' range. This suggests potential misalignments in the perceived confidence in co-workers' safety competence, underscoring a need for improved communication practices and trust-building initiatives.

Dimension 7-Workers trust in efficiency of safety systems

This dimension recorded the highest mean scores among leaders across all three sites: CS3 (3.54, SD=0.37), CS2 (3.34, SD=0.31), and CS1 (3.31, SD=0.54) indicating a strong level of confidence in the effectiveness of existing safety systems from the leadership perspective. However, while overall ratings across sites for leaders were generally positive, the worker scores at CS1 remained within the "fairly low" range. This disparity points to potential misalignments in perceptions between workers and leaders, with workers possibly exhibiting lower levels of trust in the efficacy of the established safety systems. Such discrepancies may warrant further investigation into system transparency, worker engagement, and the communication of safety protocols.

5.5 Relationship between socio-demographic factors and safety climate

The results indicate that age is the most influential socio-demographic factor in relation to safety climate perceptions at CS1, particularly in fostering worker commitment to safety (Dim4) (r=0.294, *p*=.025) and peer-based trust and communication (Dim6) (r=0.299, *p*=.022). The findings suggest that as age increases, perceptions related to commitment to safety, communication, learning and trust in peers also improve. A study by He *et al*. (2023) found significant negative relationship between age and perceived management commitment to safety. As workers get older, their perception of management's commitment to safety tends to decline (He *et al*., 2023). A similar study (Fargnoli and Lombardi, 2020) revealed a lower safety climate perception of aged workers at a general level. Elderly workers might be overconfident about their ability to deal with hazardous situations at the workplace (Fargnoli and Lombardi, 2020). These findings, however, contrast a study by Muzira (2024) that found no significant associations between age and safety climate perceptions. At CS3, strong associations for education level were also observed for Dim3 (r=0.387, p=.002), Dim4 (r=0.463, *p*=0.001), Dim6 (r= 0.412, *p*=0.001), and Dim7 (r=0.486, *p*= 0.001). The findings at CS1 and CS3 compare favourably with a study in South Africa by Muzira (2024). A study by He *et al*. (2023) also found positive correlation between coworker safety perception with education level.

5.6 Relationship between work experience and safety climate

None of the dimensions exhibited statistically significant associations across the three sites. These findings suggest that work experience did not significantly influence perceptions of safety climate in this research. In other words, regardless of the length of time an individual had been employed, their views on safety-related practices, management commitment, and communication remained largely consistent. These findings however are inconsistent with the findings of a study by Gyekye and Salminen (2010) that found an association between workers' level of experience and perception of workplace safety. The more experienced workers had more constructive perspectives regarding safety than their inexperienced counterparts (Gyekye and Salminen, 2010). A study by Muzira (2024) however showed that years of experience in the organisation significantly influenced the safety climate. More experienced workers can be appointed as mentors, coaches and role models for the inexperienced employees to assist them in attaining the desired safety maturity and collaboration (Muzira, 2024).

5.7 Relationship between knowledge of occupational injury occurrence and safety climate

A significant association was observed between knowledge of occupational injury occurrence and Dimension 2 at CS1 ($r=0.257$, $p=0.006$). A plausible explanation for this finding is that employees with greater awareness of injury incidents may perceive management's efforts toward safety empowerment more critically. This could indicate a perceived lack of effective injury prevention measures by management. No significant correlations were found between knowledge of injury occurrence and the other dimensions assessed at both CS2 and CS3. These findings contradict those of another study (Liu *et al*., 2015) that found positive correlations between safety climate and unintentional injuries.

Chapter Six: Conclusion

The research was able to draw several conclusions based on the primary research (findings) and secondary research (literature review).

Safety culture and safety climate are two distinct concepts that are always used interchangeably with safety climate being the shared perceptions of safety policies and procedures by members of an organization at a given point in time (Gillen *et al*., 2013). Homogenous subgroups tend to develop shared perceptions while between-group differences are not uncommon within an organization (Gillen *et al*., 2013).

Safety climate studies conducted in different parts of the world have positively linked safety climate with better occupational health and safety outcomes (Silva *et al*., 2013). Even though the relationship between safety climate and OHS outcomes is well-established, the specific ways through which safety climate influences those outcomes are not well understood particularly in the global south. Further, many of the existing studies do not adequately account for the complex and fragmented nature of the construction industry (Silva *et al*., 2013).

Many survey tools have been developed to measure safety climate with NOSACQ-50 being the most suitable as it has demonstrated effectiveness in predicting safety outcomes and capturing variations in safety climate across different occupational and cultural contexts (Kines *et al*., 2011).

The radar chart underscores significant differences in perceived safety climate across the three sites. While CS3 demonstrates a generally positive safety climate conducive to proactive safety behaviours, CS1's comparatively lower scores highlight a critical need for targeted interventions, particularly in managerial dimensions. CS2 represents an intermediate case, warranting continuous improvement in specific areas such as risk perception and worker engagement in safety practices. This evidence-based profiling can inform site-specific strategies to enhance occupational safety and health outcomes.

Overall, while most associations were not statistically significant, the results highlight the potential influence of gender on specific aspects of safety climate, particularly regarding perceptions of management's safety commitment and competence. The findings for CS3 underscore the importance of educational attainment in shaping workers' perceptions of safety climate. Higher levels of education appear to be consistently linked with more favorable evaluations of safety-related dimensions, particularly in areas involving safety commitment, communication, and system trust. Lack of significant correlation between work experience and safety climate dimensions implies that other factors such as educational level, organizational culture, or leadership engagement may play a more critical role in shaping safety climate perceptions.

Significant association was observed between knowledge of occupational injury occurrence and Dim 2 at CS1. The way employees behave at work plays a crucial role in connecting safety climate to unintentional injuries. In other words, a positive safety climate by itself doesn't directly reduce injuries. Instead, it influences workers' safety behaviors, which in turn help prevent accidents (Liu *et al*., 2015). Beyond the actual incidents of injuries, it is equally important to consider workers worry about being harmed at work. Understanding what workers worry about helps uncover how they perceive different risks. Therefore, recognizing and addressing these concerns not only influences safer behavior but also supports better communication and more effective safety policies (Lloyd’s Register, 2024).

Chapter Seven: Recommendations

The following recommendations were made;

1. Safety climate scores underscore the significant differences in perceived safety climate among the three sites. This evidence-based profiling can inform site-specific strategies to enhance occupational safety and health outcomes in the construction sector in Kenya.
2. The consistent divergence between leader and worker ratings underscores a need for enhanced engagement, communication, and transparency to align safety climate perceptions across roles. Focused interventions should address management empowerment, fairness, and worker involvement in safety processes.
3. Socio-demographic characteristics such as age and level of education have significant impact on safety climate among construction workers. This research recommends that players in the construction sector including the Ministry of Labour and Social Protection, the National Construction Authority, and construction companies should formulate occupational health and safety measures based on the demographic characteristics of different worker sub-groups.
4. Construction sites with a higher concentration of less experienced workers should implement more intensive onboarding and safety orientation programs to mitigate potential occupational health and safety risks.
5. Knowledge of occupational injury occurrence has a positive impact on safety climate. Knowledge and awareness of different risks shapes perception. Therefore, companies should enhance participation of workers on matters safety and communicate more effectively about safety risks and procedures.

The researcher identified an area that warrants further investigation. The researcher proposes:

1. Replicating a similar study among workers in other high-risk sectors in Kenya, such as agriculture and manufacturing.

Chapter Eight: References

Ajslev, J. *et al*. (2017) 'Safety climate and accidents at work: Cross-sectional study among 15,000 workers of the general working population', *Safety Science*, 91, pp. 320–325.

Berhanu, F., Gebrehiwot, M. and Gizaw, Z. (2019) 'Workplace injury and associated factors among construction workers in Gondar town, Northwest Ethiopia', *BMC Musculoskeletal Disorders*, 20:523

Brandt, M. *et al*. (2021) 'Safety climate as a predictor of work ability problems in blue-collar workers: Prospective cohort study', *British Medical Journal (BMJ)*, 11, pp.1-7.

Burke, J. M. *et al*. (2006) 'Relative effectiveness of worker safety and health training methods', *American Journal of Public Health*, 96(2), pp. 315-324.

Chan, A. P. C. *et al*. (2023) 'Improving safety Performance of construction workers through learning from incidents', *International Journal of Environmental Research and Public Health*, 20, pp. 1-26 doi.org/10.3390/ ijerph20054570

da Costa-Machado, R.A., Conceição, A., Rocha, F. and Branco, M. (2024) 'Assessment of muscle activity during a deadlift performed by construction workers', *Muscles*, 23: 339–348. doi.org/10.3390/ muscles3040029

Churruca, K. *et al*. (2021) 'Dimensions of safety culture: a systematic review of quantitative, qualitative and mixed methods for assessing safety culture in hospitals', *British Medical Journal (BMJ)*, 11, pp.1-13.

Fargnoli, M. and Lombardi, M. (2020) 'NOSACQ-50 for safety climate assessment in agricultural activities: A case study in central Italy', *International*

Journal of Environmental Research and Public Health, 17, 9177 doi:10.3390/ijerph17249177

George, D. and Mallery, P. (2007) *SPPSS for Windows Step By Step: A Simple Guide and Reference*. 14th ed. Boston, Mass.: Pearson Allyn and Bacon.

Gillen, M. *et al*. (2013) 'Safety Culture and Climate in Construction: Bridging the Gap Between Research and Practice', *The Center for Construction Research and Training*. Available at https://www.cpwr.com/wp-content/uploads/publications/CPWR_Safety_Culture_Final_Report_0.pdf

Gyekye, A. S. and Salminen, S. (2010) 'Organizational safety climate and work experience', *International Journal of Occupational Safety and Ergonomics*, 16(49), pp. 431-443.

Hadžibajramović, E., Schaufeli, W., and Hans D. W. (2022) 'Shortening of the Burnout Assessment Tool (BAT)—from 23 to 12 items using content and Rasch analysis', *BMC Public Health*, 22, pp 1-16.

Harrison, F. H. *et al*. (2018) 'Assessing shortened safety climate measures: Simulating a planned missing data design in a field setting', *Safety Science*, 104, pp. 189–201.

He, C. *et al*. (2023) 'Effects of demographic characteristics on safety climate and construction worker safety behavior', *Sustainability*, 15, 10985. https://doi.org/10.3390/su151410985

Huang, Y. *et al*. (2017) 'An item-response theory approach to safety climate measurement: The Liberty Mutual Safety Climate Short Scales', *Accident Analysis and Prevention*, 103, pp. 96–104.

Kemei, R. and Nyerere, J. (2016) ‘Occupational Accident Patterns and Prevention Measures in Construction Sites in Nairobi County Kenya’, *American Journal of Civil Engineering*, 4(5), pp. 254-263.

Kenya National Bureau of Statistics (2024) *Statistical Abstract 2024*. https://www.knbs.or.ke/wp-content/uploads/2024/12/2024-Statistical-Abstract1.pdf (Accessed 12 January 2025).

Kenya National Bureau of Statistics (2023) *Economic Survey 2023*. Available at https://investmentpromotion.go.ke/sites/default/files/2023-07/Economic-Survey-2023_2.pdf (Accessed 12 January 2025).

Kines, P. *et al*. (2011) ‘Nordic Safety Climate Questionnaire (NOSACQ-50): A new tool for diagnosing occupational safety climate’, *International Journal of Industrial Ergonomics*, 41(6), pp. 634-646 DOI: https://doi.org/10.1016/j.ergon.2011.08.004

Legishion, J. J., K'Akumu, O. A., and Wachira, N. I. (2024) ‘Impact of institutional frameworks on safety and health in construction sites: Enhancing safe practices in Nairobi’, *Africa Habitat Review Journal*, 19(1), pp. 2729-2741

Liu, X. *et al*. (2015) ‘Safety climate, safety behavior, and worker injuries in the Chinese manufacturing industry’, *Safety Science*, 78, pp. 173-178.

Lloyd’s Register (2024) World Risk Poll 2024 Report. Available at https://doi.org/10.60743/X8MD-V972 (Accessed 7 August 2025).

Makori, G. O., Mamati, G. E., and Njoroge, B, J. (2018) ‘Contribute to occurrence of accidents at construction sites in Nairobi County’, *Scientific Research Journal*, 6(8), pp. 1-13.

Marína, S. L. *et al*. (2019) ‘Perceptions of safety climate across construction personnel: Associations with injury rates’, *Safety Science*, 118, pp. 487-496.

Mugenda, O. M. and Mugenda, A.G. (2003) *Research Methods, Quantitative and Qualitative Approaches*. 3rd edn. Nairobi: Centre for Innovative leadership and Governance.

Muzira, T. (2024) ‘Assessing the influence of demographic factors on safety climate in construction projects: Perspectives from Southern Africa’, *Open Journal of Safety Science and Technology*, 14, pp. 147-156

Mohammadi, A., Tavakolan, M., and Khosravi, Y. (2018) ‘Factors influencing safety performance on construction projects: A review’, *Safety Science*, 109, pp. 382-397.

Nadhim, E. A. *et al*. (2018) ‘Investigating the relationships between safety climate and safety performance indicators in retrofitting work’, *Construction Economics and Building*, 18:2, pp. 110-129. http:// dx.doi.org/10.5130/AJCEB. v18i2.5994

Naji, A. M. G. *et al*. (2021) ‘Impact of safety culture on safety performance; Mediating role of psychosocial hazard: An integrated modelling approach’, *International Journal of Environmental Research and Public Health*, 18, pp. 1-20.

Ncube, F. and Kanda, A. (2018) ‘Current status and the future of occupational safety and health legislation in low- and middle-income countries’, *Safety and Health at Work*, 9, pp. 365-371.

Nielsen, B. M., Hystad, W. S., and Eid, J. (2016) ‘The Brief Norwegian Safety Climate Inventory (Brief NORSCI)–Psychometric properties and relationships with shift work, sleep, and health’, *Safety Science*, 83, pp. 23–30.

Nyabionge, B. M., Wachira-Towey, I. N., and Ralwala, A. O. (2022) ‘Safety in building construction works: A review of the causes of accidents and safety regulations requirements in Kenya’, *Journal of the Kenya National Commission for UNESCO*, 2(1), pp. 1-12

Olutende, M. *et al*. (2021) ‘Predictors of Occupational Health and Safety Management practices in the Building Construction Industry, Kakamega Kenya’, *Journal of Nursing and Health Science*, 10(2), pp. 43-57.

Restuputri, P. D. *et al*. (2021) ‘Relationship between safety culture and the safety climate, safety behavior, and safety management’, *M.I.P.I*, 15(2), pp. 105-114.

Silva, S. *et al*. (2013) ‘Safety climates in construction industry: Understanding the role of construction sites and workgroups’, *Open Journal of Safety Science and Technology*, 3, pp. 80-86.

Schwatka, N. V., Hecker, S., and Goldenhar, M. L. (2016) ‘Defining and measuring safety climate: A review of the construction industry literature’, *Annals of Occupational Hygiene*, 60(5), pp. 537–550.

Sukapto, P. *et al*. (2018) ‘A new approach to the assessment of the safety environment and performance in the footwear industry’, *International journal of simulation: systems, science, and technology*, 19(5), pp. 1-7.

Summers, D. *et al*. (2022) ‘The development of a brief and practical work safety climate measure’, *International Journal of Industrial Ergonomics*, 87, pp. 1-11.

Sutalaksana, Z. I., Anatasia, M., and Yassierli (2016) ‘Linking safety climate perception to types of behavior’, *Work*, 55, pp. 231-239

Syed-Yahya, S.N.N., Idris, M. A., and Noblet, J. A. (2022) ‘The relationship between safety climate and safety performance: A review’, *Journal of Safety Research*, 83, pp. 105-118

Windapo, A.O. (2016) ‘Skilled labour supply in the South African construction industry: The nexus between certification, quality of work output and shortages’, *SA Journal of Human Resource Management*, 14(1), pp. 1-8 http://dx.doi. org/10.4102/sajhrm. v14i1.750

Yari, S. *et al*. (2019) ‘Interaction of safety climate and safety culture: A model for cancer treatment centers’, *Asian Pacific Journal of Cancer Prevention*, 20 (3), pp. 961-969.

Yousefi, Y. *et al*. (2016) ‘Validity Assessment of the Persian version of the Nordic Safety Climate Questionnaire (NOSACQ-50): A case study in a steel company’, *Safety and Health at Work*, 7, pp. 326-330.

Zohar, D. (2013) ‘Safety Climate: Conceptualization, Measurement, and Improvement’, *Safety Climate*, pp. 317-334.

Chapter Nine: Appendices

Appendix 1: The NOSACQ-50 Questionnaire (English version)

The purpose of this questionnaire is to get your view on safety at this workplace.

Your answers will be processed on a computer and will be dealt with confidentially. No individual results will be presented in any way.

Although we want you to answer each and every question, you have the right to refrain from answering any one particular question, a group of questions, or the entire questionnaire.

Background information

Do you have a managerial position, e.g. manager or supervisor?	**YES** ☐	**NO** ☐

Section A: Socio-demographic information

1. Gender:
   - ☐1 Male
   - ☐2 Female
   - ☐3 Other
2. Age:
   - ☐1 Less than 18 yrs
   - ☐2 18 to 30 yrs
   - ☐3 30 to 40 yrs
   - ☐4 Over 40 yrs
3. Highest class passed:
   - ☐1 No education
   - ☐2 Primary
   - ☐3 Secondary/High School
   - ☐4 Tertiary/University

4. How long have you worked in the construction sector?
   ☐1 Less than 1 year
   ☐2 1 to 3 years
   ☐3 3 to 5 years
   ☐4 Over 5 years

5. Have you or someone you personally know, ever been injured at work in the past twelve months?
   ☐1 YES
   ☐2 NO

In the following section please describe how you perceive that the managers and supervisors at this workplace deal with safety.				
Although some questions may appear very similar, please answer each one of them.				
	Strongly disagree	*Disagree*	*Agree*	*Strongly agree*
	Put only one X for each question			
1. Management encourages employees here to work in accordance with safety rules - even when the work schedule is tight	☐	☐	☐	☐
2. Management ensures that everyone receives the necessary information on safety	☐	☐	☐	☐
3. Management looks the other way when someone is careless with safety	☐	☐	☐	☐

4. Management places safety before production	☐	☐	☐	☐
5. Management accepts employees here taking risks when the work schedule is tight	☐	☐	☐	☐
6. We who work here have confidence in the management's ability to deal with safety	☐	☐	☐	☐
7. Management ensures that safety problems discovered during safety rounds/evaluations are corrected immediately	☐	☐	☐	☐
8. When a risk is detected, management ignores it without action	☐	☐	☐	☐
9. Management lacks the ability to deal with safety properly	☐	☐	☐	☐
10. Management strives to design safety routines that are meaningful and actually work	☐	☐	☐	☐
11. Management makes sure that everyone can influence safety in their work environment	☐	☐	☐	☐

12. Management encourages employees here to participate in decisions which affect their safety	☐	☐	☐	☐
13. Management never considers employees' suggestions regarding safety	☐	☐	☐	☐
14. Management strives for everybody at the worksite to have high competence concerning safety and risks	☐	☐	☐	☐
15. Management never asks employees for their opinions before making decisions regarding safety	☐	☐	☐	☐
16. Management involves employees in decisions regarding safety	☐	☐	☐	☐
17. Management collects accurate information in accident investigations	☐	☐	☐	☐
18. Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	☐	☐	☐	☐
19. Management listens carefully to all who have been involved in an accident	☐	☐	☐	☐

20. Management looks for causes, not guilty persons, when an accident occurs	☐	☐	☐	☐
21. Management always blames employees for accidents	☐	☐	☐	☐
22. Management treats employees involved in an accident fairly	☐	☐	☐	☐
In the following section please describe how you perceive that employees at this workplace deal with safety				
23. We who work here try hard together to achieve a high level of safety	☐	☐	☐	☐
24. We who work here take joint responsibility to ensure that the workplace is always kept tidy	☐	☐	☐	☐
25. We who work here do not care about each others' safety	☐	☐	☐	☐
26. We who work here avoid tackling risks that are discovered	☐	☐	☐	☐
27. We who work here help each other to work safely	☐	☐	☐	☐

28. We who work here take no responsibility for each others' safety	☐	☐	☐	☐
29. We who work here regard risks as unavoidable	☐	☐	☐	☐
30. We who work here consider minor accidents to be a normal part of our daily work	☐	☐	☐	☐
31. We who work here accept dangerous behaviour as long as there are no accidents	☐	☐	☐	☐
32. We who work here break safety rules in order to complete work on time	☐	☐	☐	☐
33. We who work here never accept risk-taking even if the work schedule is tight	☐	☐	☐	☐
34. We who work here consider that our work is unsuitable for cowards	☐	☐	☐	☐
35. We who work here accept risk-taking at work	☐	☐	☐	☐

36. We who work here try to find a solution if someone points out a safety problem	☐	☐	☐	☐
37. We who work here feel safe when working together	☐	☐	☐	☐
38. We who work here have great trust in each others' ability to ensure safety	☐	☐	☐	☐
39. We who work here learn from our experiences in order to prevent accidents	☐	☐	☐	☐
40. We who work here take each others' opinions and suggestions concerning safety seriously	☐	☐	☐	☐
41. We who work here seldom talk about safety	☐	☐	☐	☐
42. We who work here always discuss safety issues when such issues come up	☐	☐	☐	☐
43. We who work here can talk freely and openly about safety	☐	☐	☐	☐
44. We who work here consider that a good safety representative	☐	☐	☐	☐

plays an important role in preventing accidents				
45. We who work here consider that safety rounds/evaluations have no effect on safety	☐	☐	☐	☐
46. We who work here consider that safety training to be good for preventing accidents	☐	☐	☐	☐
47. We who work here consider early planning for safety as meaningless	☐	☐	☐	☐
48. We who work here consider that safety rounds/evaluations help find serious hazards	☐	☐	☐	☐
49. We who work here consider safety training to be meaningless	☐	☐	☐	☐
50. We who work here consider it important to have clear-cut goals for safety	☐	☐	☐	☐

Thank you!

The NOSACQ-50 Questionnaire (Kiswahili version)

Lengo la dodoso hili ni kupata maoni yako kuhusu usalama katika mahali hapa pa kazi. Majibu yako yatashughulikiwa kwa kompyuta na yatashughulikiwa kwa siri. Hakuna matokeo ya mtu binafsi yatakayoonyeshwa kwa njia yoyote. Ingawa tunataka ujibu kila swali, una haki ya kukataa kujibu swali lolote, kikundi cha maswali, au dodoso lote.

Taarifa za msingi

Je, una nafasi ya usimamizi, kwa mfano meneja au msimamizi?	**Ndiyo** ☐	**La** ☐

Sehemu A: Taarifa za kijamii na kidemografia

1. Jinsia:
   - ☐1 Kiume
   - ☐2 Kike
   - ☐3 Nyingineyo

2. Umri:
   - ☐1 Umri chini ya 18
   - ☐2 Umri wa 8 hadi 30
   - ☐3 Umri wa 30 hadi 40
   - ☐4 Umri zaidi ya 40

3. Kiwango cha juu zaidi ya masomo:
   - ☐1 Bila Elimu
   - ☐2 Shule ya msingi
   - ☐3 Shule ya sekondari /Upili
   - ☐4 Elimu ya juu/Chuo Kikuu

4. Umefanya kazi kwa muda gani katika sekta ya ujenzi?

☐1 Chini ya mwaka 1

☐2 Mwaka 1 hadi 3

☐3 Miaka 3 hadi 5

☐4 Zaidi ya miaka 5

5. Je, wewe au mtu unayemfahamu binafsi, umewahi kujeruhiwa kazini katika miezi kumi na mbili iliyopita??

☐1 NDIO

☐2 LA

Katika sehemu hii tafadhali eleza mtazamo wako kuhusu jinsi mameneja na wasimamizi wanavyoshughulikia masuala ya usalama kazini. Japo maswali mengine yanaonyesha kufanana, tafadhali jibu kila swali.

	Napinga kabisa	Napinga	Nakubali	Nakubali kabisa
	Weka alama moja ya X kwa kila swali			
1. Wasimamizi wanawahimiza waajiriwa hapa kufanya kazi kulingana na sheria za usalama, hata kama mpangilio wa kazi ni mgumu	☐	☐	☐	☐
2. Wasimamizi wanahakikisha kuwa kila mmoja anapata habari/ujumbe unaofaa kuhusu usalama	☐	☐	☐	☐
3. Wasimamizi hujifanya hamnazo mtu akikosa kutilia maanani usalama	☐	☐	☐	☐
4. Wasimamizi huupa usalama kipaumbele kabla ya uzalishaji	☐	☐	☐	☐
5. Wasimamizi hukubali waajiriwa hapa kuchukua tahadhari ya hatari ikiwa mpangilio wa kazi ni ngumu	☐	☐	☐	☐
6. Sisi tunaofanya kazi hapa tuna imani na uwezo wa wasimamizi katika kuyakabili maswala ya usalama	☐	☐	☐	☐
7. Wasimamizi huhakikisha kuwa shida za usalama zilizogunduliwa katika shughuli za utathmini zimerekebishwa mara moja/papo hapo	☐	☐	☐	☐
8. Hatari ikigunduliwa, wasimamizi huipuuza bila kuichukulia hatua	☐	☐	☐	☐
9. Wasimamizi wamekosa uwezo wa kukabiliana na usalama barabara	☐	☐	☐	☐

Japo maswali mengine yanaonyesha kufanana, tafadhali jibu kila swali

	Napinga kabisa	Napinga	Nakubali	Nakubali kabisa
	Weka alama moja ya X kwa kila swali			
10. Wasimamizi hujitahidi kuweka utaratibu teule za usalama ambazo ni za maana na zinazoaminika	☐	☐	☐	☐
11. Wasimamizi huhakikisha kuwa kila mtu amechangia katika usalama kazini	☐	☐	☐	☐
12. Wasimamizi huwahimiza waajiriwa hapa kushiriki katika maamuzi ambayo huathiri usalama wao	☐	☐	☐	☐
13. Wasimamizi huwa hawazingatii mapendekezo yanayotolewa na waajiriwa kuhusu usalama	☐	☐	☐	☐
14. Wasimamizi ujitahidi kuhakikisha kuwa kila mtu katika mahali pa kazi ana uwezo wa hali ya juu kuhusiana na usalama na hatari zake	☐	☐	☐	☐
15. Wasimamizi huwa hawawaulizi waajiriwa kuhusu maoni yao kabla maamuzi yanayohusu usalama kuafikiwa	☐	☐	☐	☐
16. Wasimamizi huwahusisha waajiriwa katika maamuzi kuhusiana na usalama	☐	☐	☐	☐
17. Wasimamizi huchukua habari sahihi katika uchunguzi wa ajali	☐	☐	☐	☐
18. Uoga wa kupewa onyo kutoka kwa wasimamizi huwavunja moyo waajiriwa wasiweze kutoa ripoti kuhusu ajali ambazo huenda zikatokea	☐	☐	☐	☐
19. Wasimamizi huwasikiza wale wote ambao wamehusika katika ajali	☐	☐	☐	☐

Japo maswali mengine yanaonyesha kufanana, tafadhali jibu kila swali

		Napinga kabisa	Napinga	Nakubali	Nakubali kabisa
		Weka alama moja ya X kwa kila swali			
20.	Wasimamizi hutafuta vyanzo, na wala si wale wanaopatikana na hatia, ajali inapotokea	☐	☐	☐	☐
21.	Wasimamizi huwalaumu waajiriwa kila mara kunapotokea ajali	☐	☐	☐	☐
22.	Wasimamizi huwashughulikia waajiriwa waliohusika katika ajali vilivyo	☐	☐	☐	☐

Katika sehemu hii tafadhali eleza mtazamo wako kuhusu jinsi waajiriwa wanavyoshughulikia masuala ya usalama kazini

23.	Sisi tunaofanya kazi hapa hujaribu sana kushirikiana kufikia kiwango cha juu cha usalama	☐	☐	☐	☐
24.	Sisi tunaofanya kazi hapa huchuka jukumu la pamoja kuhakikisha kuwa kuna usafi mahali pa kazi	☐	☐	☐	☐
25.	Sisi tunaofanya kazi hapa hatujali usalama wa wenzetu	☐	☐	☐	☐
26.	Sisi tunaofanya kazi hapa hukwepa kukabiliana na hatari zinazogunduliwa	☐	☐	☐	☐
27.	Sisi tunaofanya kazi hapa husaidiana kufanya kazi kwa usalama	☐	☐	☐	☐
28.	Sisi tunaofanya kazi hapa hatuwajibikii usalama wa wenzetu	☐	☐	☐	☐

Japo maswali mengine yanaonyesha kufanana, tafadhali jibu kila swali

	Napinga kabisa	Napinga	Nakubali	Nakubali kabisa
	Weka alama moja ya X kwa kila swali			
29. Sisi tunaofanya kazi hapa hushikilia kuwa hauwezi kukwepa hatari	☐	☐	☐	☐
30. Sisi tunaofanya kazi hapa huchukulia kuwa ajali ndogo ndogo ni hali ya kawaida katika shughuli za kazi	☐	☐	☐	☐
31. Sisi tunaofanya kazi hapa hukubali mienendo mibaya pasi na ajali	☐	☐	☐	☐
32. Sisi tunaofanya kazi hapa hukiuka sheria za usalama ili kukamilisha kazi kwa wakati	☐	☐	☐	☐
33. Sisi tunaofanya kazi hapa hatukubali kukumbana na changamoto hata kama mpangilio wa kazi ni ngumu	☐	☐	☐	☐
34. Sisi tunaofanya kazi hapa huchukulia kuwa kazi yetu haiwezi kufanywa na waoga	☐	☐	☐	☐
35. Sisi tunaofanya kazi hapa hukubali kukabiliana na hatari kazini	☐	☐	☐	☐

---

36. Sisi tunaofanya kazi hapa hujaribu kupata suluhu ikiwa mtu atagundua tatizo la usalama	☐	☐	☐	☐
37. Sisi tunaofanya kazi hapa hujihisi salama tunapofanya kazi pamoja	☐	☐	☐	☐
38. Sisi tunaofanya kazi hapa tuna imani katika uwezo wa kila mtu kuhakikisha usalama	☐	☐	☐	☐

Japo maswali mengine yanaonyesha kufanana, tafadhali jibu kila swali

	Napinga kabisa	Napinga	Nakubali	Nakubali kabisa
	Weka alama moja ya X kwa kila swali			
39. Sisi tunaofanya kazi hapa hujifunza kutokana na tajriba zetu katika kuepuka ajali	☐	☐	☐	☐
40. Sisi tunaofanya kazi hapa hutilia maanani maoni na mapendekezo ya kila mmoja wetu kuhusu usalama	☐	☐	☐	☐
41. Sisi tunaofanya kazi hapa huzungumzia usalama kwa nadra	☐	☐	☐	☐
42. Sisi tunaofanya kazi hapa hujadiliana kuhusu usalama wakati maswala hayo huibuka	☐	☐	☐	☐
43. Sisi tunaofanya kazi hapa huzungumza kwa uwazi kuhusu usalama	☐	☐	☐	☐
44. Sisi tunaofanya kazi hapa huchukulia kuwa mwakilishi bora wa usalama huchangia sana katika kuepuka ajali	☐	☐	☐	☐
45. Sisi tunaofanya kazi hapa huchukulia kuwa tathmini za kiusalama hazina athari katika usalama	☐	☐	☐	☐
46. Sisi tunaofanya kazi hapa huchukulia kuwa mafunzo ya usalama ni muhimu katika kuepuka ajali	☐	☐	☐	☐
47. Sisi tunaofanya kazi hapa huchukulia kuwa matayarisho ya mapema kuhusu usalama hauna maana	☐	☐	☐	☐
48. Sisi tunaofanya kazi hapa huchukulia kuwa tathmini za kiusalama husaidia katika kugundua athari kubwa	☐	☐	☐	☐
49. Sisi tunaofanya kazi hapa huchukulia kuwa mafunzo kuhusu usalama haina maana	☐	☐	☐	☐
50. Sisi tunaofanya kazi hapa huchukulia kuwa ni muhimu kuwa na malengo hakika kuhusu usalama	☐	☐	☐	☐

Ukihitaji kutoa maelezo ya kina kwa baadhi ya majibu yako, au ukiwa na maoni ya ziada kuhusu utafiti, umekubaliwa kuyawasilisha hapa.

Maoni:

____

____

____

☺ Asante kwa kujaza hojaji hii. Tafadhali hakikisha kuwa umeweka alama ndani ya sanduku kwenye kurasa ya kwanza kuonyesha kuwa umetoa idhini yako ya kushiriki katika utafiti ☺

FORSKNINGSCENTER FOR ARBEJDSMILJØ
NATIONAL RESEARCH CENTRE FOR THE WORKING ENVIRONMENT

GÖTEBORGS UNIVERSITET

Vinnueftirlitið
www.vinnueftirlit.is

IRIS International Research Institute of Stavanger

Työterveyslaitos

Baraza la Mawaziri, Nordic

nfa.dk/NOSACQ