Safety Risk Management Practices and Safety Bahaviour: The Role of Safety Risk Perception in Integrated Health Centres of Kumbo East Health District

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ABSTRACT

This study investigated the effect of safety management practices on safety behavior with the mediating role of safety risk perception. It specifically investigated the effect of safety management practices on safety behaviour; the effect of safety management practices on safety risk perception and the mediating role of safety risk perception on the effect of safety management practices on safety behaviour. Data was collected purposively from 146 employees of the 17 health centres of Kumbo East Health District, which are integrated to the Kumbo District Hospital with the aid of a closed ended questionnaire. Findings through multiple regression analysis proved that Safety management practices have a significantly negative effect on the safety behavior of employees of these health centres. Further, it was revealed that safety management practices have a significantly positive effect on their safety risk perception. And finally, the study proved that although safety management practices have a negative effect on safety behavior, safety risk perception indirectly mediates this effect. This study reveals that in resource-scarce health systems with weak safety infrastructure, raising risk awareness without accompanying behavioural support resources may produce counterproductive effects. When health workers are aware of risks but lack coping resources—such as adequate personal protective equipment, convenient hand hygiene facilities, or reliable vaccine access; risk perception may trigger anxiety, helplessness, or avoidance behaviour rather than protective behaviour. Effective and constant safety training could narrow these glaring gaps, leaving a safety life that embodies all its necessities in the work environment.

Keywords: Safety management practices, safety risk perception, safety behaviour

INTRODUCTION

Background of the study

According to Berinyuy (2021), human resources are the hub that propels the smooth running of an organisation. It is therefore necessary for organisations in every industry to uphold effective use of human resource management practices to enhance performance. One of the human resource related practices is seemingly overlooked or neglected among the practices is occupational health and safety. This practice dates back to the period of the industrial revolution alongside issues related to industrial relations (Oginni et al, 2022). Jackson et al (2014) define occupational health and safety as a broad concept that looks at the physiological and psychological conditions of labor that arise from the work environment provided by the organisation. They point out that it deals with employee poor heath that arises from different working conditions and environment that are hazardous to employees' health. Physiological conditions in this case are cases of accidents and diseases that can lead to pains, injuries, ill health or loss of life (physical harm). Psychological conditions here look at cases of mental and emotional health such as employee apathy, withdrawal, exhaustion, confusion (human feeling). These are all conditions that are viewed as responses to employees work environment stresses and work life challenges (Tabitha, 2018). Occupational health and safety is a human resource practice that is used in diverse ways by various professionals such as engineers, doctors, nurses, teachers etc.

Organizational health and safety issues have been preoccupying in most African countries. This preoccupation stands as a result of the inadequate attention that has been given to this facet of management by governments and the industries (RCA, 1998). The confusion has been borne of the fact that most African countries and even some developing economies are negligent to the importance of occupational health and safety. This negligence is said to have been as a result of the competing political, social and economic environments (Gbadago et al, 2017, Coa et al 2021). According to Segbenya and Yeboah (2022), the effect of negligence on occupational health and safety measures in Africa has been deaths, permanent disabilities, severe injuries absenteeism etc. A study on occupational hazards among health workers in Africa found that the lifetime prevalence of needle stick injury ranged from 22–95percent, and one-year prevalence ranged from 39–91 percent. It was also reported that 21–32 percent of respondents linked poor knowledge or training with prevention of needle stick injuries. Rates of recapping needles ranged from 12–57 percent (Mossburg, et al 2019). In an earlier study that was carried out in a health facility in South Africa it was found that infection with HIV as a result of sharp objects' injuries was 41 percent amongst nurses, 38 percent among cleaners and 6 percent among administrators (Shisana et al, 2004). It will not even be adequate to lay the total blame and consequences of negligence to occupational health and safety on the governments, legislations in place or the organisation. They at least do their utmost best to provide some required resources, trainings and encourage employees to hold on to occupational health and safety measures, but so much of this negligence is the handiwork of employees at work. Many of them negligently resort to unsafe behaviors that may result to accidents. These habits tend to portray very poor safety behaviour of the organisations.

Although this problem is said to be common in nearly all industries, the health sector is one of the sectors where employees need not to be negligent on the importance of occupational health and safety measures despite the little effort in place from employers, and legislation. Facts according to the WHO (2006) Show that sub-Saharan Africa habours 11 percent of the world's population, 25 percent of global diseases, but has just 3 percent of health workers and receives just less than 1 percent of the global health expenditure. This shows a high exposure of health workers to safety risks and sounds a caution on how careful health employees must be in regard to their safety at work with the little measure made available to them. According to Abdullah et al (2009), about 80 to 90 percent of industrial accidents in public hospitals were borne of negligence from employees when on their duty positions. In line with this, Tandi et al (2016) saw that there is a need for effective occupational health and safety management in regard to employee safety behaviour. To them blending the interaction among people, facilities and management practices is very important for this to be achieved. To blend the interaction among people, facilities and management practices, it is necessary for management to focus on the need for better safety behaviour by employees. Without visible employee safety behaviour, management effort may go futile in an attempt to ensure employee health and safety in an organisation. The results of what is happening in Africa in general, point to the possibility that much is left to be desired in regards to the safety behaviour of health workers. But what are the surrounding circumstances that promote or may kill this negligence?

Concern about occupational health and safety remains an international, national and local or organizational matter for long. The international labour organisation (ILO), governments and local laws have been very active in ensuring that employers and employees are ready to ensure and implement effective occupational health and safety measures for the safety of employees. Some measures of occupational health and safety are safety culture, safety leadership, safety risk perception and safety behavior. Safety culture is about those beliefs, attitudes, norms, social rules and technological practices that are meant to reduce the exposure of workers, customers, managers, and members of the public to unsafe and hazardous conditions (Saleem et al, 2022). Zhao et al (2022, 2) define safety leadership as "…..an influence process in which the safety leader (manager or supervisor) improves the work safety environment of the enterprise, guides, or requires employees to regulate their own safety behaviors, and helps them obtain the support of the organization to achieve the overall safety goal of the enterprise…" Risk perception according to Rahul (2023) is defined as people's judgments and assessment of hazards that might pose immediate or long-term threats to their health and well-being. It refers to people's subjective judgments about the likelihood of negative occurrences such as injury, illness, disease, and death. The safety behaviour of employees is very much a dependent on safety leadership, safety culture, safety risk perception etc

According to La Barbera and Ajzen (2021) Safety behavior is the employee's will or intention on compliance with safety rules or to their participation in safety maintenance. The promotion of one or many of these occupational health and safety practices has advantages such as better safety performance, reduction of staff turnover, organisational performance, promotion of corporate image, employee satisfaction, employee productivity ete (Naidoo and Wills, 2010) Safety behaviour (which is also seen as safety performance) stands for employees actual compliance with safety rules and participation in safety maintenance. Safety compliance regards to the main safety activities that employees must carry out to maintain workplace safety, such as following safety rules and procedures and proper use of personal protective equipment (PPE). Safety behaviour could be summarily described as employee behavior with safety resources in place as a personal and work role (Griffin and Neal, 2000).

The issue of employee safety behaviour in Cameroon has been a bone of contention, many studies have shown that employees still have a negligent behavior with the safety resources in place that show a poor safety behaviour of health workers. An Observance of standard precautions for infection prevention in the COVID-19 era in Yaounde, Cameroon, showed that majority of health workers (53.5 percent of them) did not wash their hands after each care. The negligent reasons for not washing hands after each process were the perception that the patient cared for was risk free, high workload and distant washing point (Cheuyem et al 2023). In another study in the Southwest region of Cameroon, to determine the perception and degree of satisfaction of health personnel involved in clinical practices with respect to occupational health and safety management practices, it was found that employees had a least perception of their safety goals; a result which negatively affects their safety behaviour. A study of neglected diseases among health care workers in Cameroon, found that 4.6 percent HIV, 6.3 percent Hepatitis B virus and 1.7 percent Hepatitis C were reported amongst health workers infection in the South West region and 18.25% of Hepatitis B among health care workers in the Northern region of the country, among all of these victims, none of them indicated any previous history of infection (Fritzsche et al ,2013). Although their sources of infection were not determined, it was widely suspected that the main source could be from patient to health worker, a situation that could be caused by mainly health worker negligence of the occupational health and safety measures in place (poor safety behaviour). A recent study by Cheuyem et al (2025) of Health Care Workers in the obstetrics-gynecology ward of a referral hospital in Yaoundé found that majority (59% of them) had experienced some accident exposure to body fluids, with few (27% of them) fully vaccinated for hepatitis B, 19% against covid-19 and 0 % for Cholera. In another study by Dzekashu et al (2017) in the Kumbo East and West health districts, showed that despite the fact that all healthcare workers in these districts were aware of the health risk of healthcare waste, the use of personal protective equipment varied among them. It was found that waste handlers and laboratory technicians were more conscious of the need to use these equipment than the rest of the healthcare workers, worst is that waste handlers (despite their consciousness – safety behavior- and exposure to safety risk) used more of examination gloves in waste handling, which is not appropriate.

Interesting is that these studies project the presence of some triggers of safety bahviour such as a safety culture, safety a leadership and safety risk perception. The presence of safety training, protective equipment, safety awareness; show the fact that employers do their little best to ensure the safety of employees but the worry remains on the very fact that employees seem not to be very ready for adequate safety behaviour, despite their awareness and intent to behave safely. One is tempted here to feel that although these safety measures are available, they are not being put to effective use. Are the existing occupational health and safety measures effective for effective safety behaviour? What about their personal safety risk perception?

The problem

Going by the ILO conventions and legislation in Cameroon, healthcare workers like any other worker in any industry have a right and a duty to be protected at work. The safety and health of these workers have to be upheld by both employers and employees as a means of guaranteeing better performance. According to Alisimo (2003) it is generally known that when employees experience that the workplace is safe and healthy with supportive resources and facilities, they tend to participate exceptionally in the process of production as they make good use of these resources and facilities. Going by Maslow's theory of hierarchy of needs, man

seeks satisfaction from the basic needs such as (physiological and safety needs) before looking onto high-level needs up to self-actualization. It is rather unfortunate that in the Cameroon healthcare industry, despite the little or inadequate supply of the health and safety needs of health workers, employees are yet to uphold the efficient and effective use of these resources and to have a better perception of the risk they face as they work. Despite the fact that they are aware an even have the intention to follow these measures, they get very negligent about the health and safety rules. The negligence with which they respect and maintain occupational health and safety rules, tells of the poor safety behaviour of these health institutions; a situation that can aggravate the already existing health worker crisis in the country.

In Kumbo East health district in particular, the inappropriate use of health and safety facilities and resources by health workers portrays poor safety behaviour in this sector. Just their varied and wrong use of personal protective equipment could be the tip of the iceberg for serious poor safety behaviour in this health district. After being informed by the work of Dzekashu et al, a keen observation of health workers in some of the health centres of this health district by this researcher showed very clearly that most of the workers are very negligent about performing their health and safety duties despite their awareness. One wonders how they even perceive safety risk if management were even poorly attending to their safety needs or safety practices. For example, during the covid-19 era, when 'hand wash' was a sing song with donated hand wash stations, it was still common to find health workers somehow negligent about washing their hands after contacts with customers or some unsafe points. Worrisome was also the fact that regular refilling of the hand wash stations with water was not regular. Even cleaning of equipment and sometime environment is commonly done without protective equipment by these health workers. This behaviour poses a worry on whether the safety measures in place have not been effective to extinguish this safety negligence. It looks very confusing that the health workers have the intention and will to follow safety rules at work but are negligent in complying with these rules while at work. This worry must be taken serious because according to Dember (2011) and Leigh (2011), workplace illnesses, injuries and stress have caused serious and often long-term physical, emotional, and economic hardship for businesses, workers, their families, and communities. It has also led to the growing burden of work-related morbidity and mortality. Smith and DeJoy(2012) have called for a concerted, sustained effort by management researchers, public health researchers, practitioners, and health care providers to explore the personal and occupational risk factors that contribute to ill health in the health care workforce and the measures that can be taken to ensure the effectiveness of occupational health and safety. Behind this backdrop, one therefore finds needs to investigate the effect of some facets of occupational health and safety management practices on safety behavior, with the mediation of safety risk perception in the integrated health centres of Kumbo East Health District of Cameroon. And to propose better ways by which these safety measures can be effectively used to enhance effective safety behaviour for the safety the health family.

Objectives

Generally to investigate the effect of safety management practices on safety behaviour, with the mediating role of safety risk perception in the integrated health centres of Kumbo east health district

And specifically to investigate:-

- The effect of safety management practices on safety behaviour
- The effect of safety management practices on safety risk perception
- The mediating role of safety risk perception on the effect of safety management practices on safety behaviour

LITERATURE REVIEW

Concepts in the study

The conceptual literature looks at the key concepts of safety management practices

(Safety culture, safety leadership, safety climate safety communication), which form the independent variables safety risk perception, which is the mediating variable and safety behaviour, which is the dependent variable in the study.

Safety management practices

Safety management practices are the functions that are used to manage organizational safety performance (Ladewski and Al-Bayati (2019). Organisations do develop and implement Safety management systems to identify, evaluate, control, reduce safety risk as well as prevent accidents from occurring. A safety management system takes into consideration the programs, processes, policies, and procedures for which there is formal function overseeing their development, implementation, and ongoing administration. These management practices are mostly codified in writing and issued as approved documents that specify functions, roles, responsibilities and authorities within the organisation. Some of the safety management practices are ever present in organisations are safety culture, safety leadership, safety climate and safety communication (Sajithkumar, 2023).

Safety Culture

According to Saleem et al (2022) Safety culture is about those beliefs, attitudes, norms , social rules and technological practices that are meant to reduce the exposure of workers, customers, managers, and members of the public to unsafe and hazardous conditions. On their part, Glendon and Stanton (2000), had earlier pointed out that safety culture includes (1) norms and policies, which are related to safety (2) common values, beliefs, attitudes and behaviours regarding safety (3) the common values, attitudes, competences and behaviours of individuals and groups that bring in organisational commitment to, and style and proficiency of, a safety programme. These definitions tie with that of Reason, (1997, 194) who held that "…..The safety culture of an organisation is the product of individual and group values, attitudes, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety programmes. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measure…."

A review by Human Engineering (2005) came out with two useful and related ways of approaching safety culture. The first approach was based on Cooper's model in 2000. It has distinguished three inter-related aspects of safety culture, which are; psychological (how people feel about safety and safety management systems - safety climate); behavioural (what people do – including safety-related activities, actions and behaviours); and situational (what the organisation has – policies, operating procedures, management systems, control systems, communication systems). The second approach according to Correll and Andrewartha (2000) introduces two ways of treating safety culture, which are; what an organisation is (the beliefs, attitudes and values of its members about safety –or climate) and what an organisation has (structures, policies, practices and controls- safety audits and performance figures).

According to Naji et al (2021) safety culture can be measured from the dimensions of management commitment, work environment, involvement and training dimensions.

Management commitment: According to Hansez and Chmiel (2010) management commitment envisages how much mangers are engaged through a bahaviour that supports other staff to meet the determined goals of the organisation. Besides upholding the functions of management, it is but very imperative for managers to be fully engaged through their daily routine in ensuring that subordinates are focused to meeting the desired goals of the organisation. As an aspect of safety culture, management commitment can be investigated either by asking direct questions to managers or by monitoring their commitment behaviors through the subordinates. It is possible to find some managers openly admitting that they are not committed to employee safety rules (Joung et al, 2015).

Work environment: This requires that management puts procedures and policies in place that will ensure the health and safety of employees. Here management is expected to identify hazards and controls in regard

to conventions and standards by government, performing of safety trainings and the education of employees on the importance of health and safety (Mearns et al, 2013). According to Naji et al (2021), a healthy and safe work environment is one that upholds the professional and legal responsibilities that afford staff with a workplace that is free of hazards which may cause serious physical injury or death, and to preserve safe and healthy working conditions for their staff. According to Putri et al (2018) Safety work environment stands for the physical environment in which employees' work. It looks at factors that are under the control of the organisation such as lighting, noise, vibrations, humidity, temperature, air quality and how they are being managed etc

Involvement of employees: employees' involvement here denotes the need for a participatory approach to health and safety management. It stands for the ability of management to support and promote employees to participate and be consulted in the matters of health and safety in the organisation or unit. Here employee involvement could have an encouraging impact on the health and safety performance of the organisation (Chirico et al, 2019).

Safety Leadership

According to Wu (2005), Safety leadership is the process of interaction between leaders and followers. He points that this interaction is one by which leaders could exert some influence on their followers to achieve organisational safety goals, in regard to existing organisational and individual factors. From another position, Zhao et al (2022, 2) define safety leadership as "…..an influence process in which the safety leader improves the work safety environment of the enterprise, guides, or requires employees to regulate their own safety behaviors, and helps them obtain the support of the organization to achieve the overall safety goal of the enterprise…". According to Barling et al (2002), this leadership can be transformational. Barling and Zacharatos (1999) had earlier described safety transformational leadership as a relatively ideal state wherein the leader instills confidence and values in his subordinates, motivates them, and describes the vision so that they can recognize and take actions that are consistent with the organization's goals. Here they explain that transformational safety leadership expects the managers to be personally committed to and have an active interest on the occupational health and safety of employees. A transformational leader needs to exert inspirational appeals and use emotional language to refocus employee commitment to the ideals of health and safety and to the goals of the organisation (Fernández-Muñiz et al, 2017).

The argument by Fernández-Muñiz et al is that good words are not just sufficient to inspire employees to commit to safety. It is in this backdrop that the participative safety leadership style for employee health and safety has been seen to be a necessity for safety leadership. Zhao et al define participative leadership as one in which the leader monitors the safety behavior of employees, cares for employees individually, discusses safety issues with them, and actively manages safety before an accident occurs. Here there is direct involvement of the leader and the subordinates in safety activities. This could happen through frequent informal communication between the leader and his subordinates through safety inspections, seminars and trainings with the involvement of all. In this case employees are ready to uphold safe behavior as they will feel that they are valued in the organisation through good quality relationship with their leaders (Eid et al., 2012). Safety passive leadership is one where the safety leader does not take the initiative to participate in or encourage safety practices but rather will be very ready to take action in case of an occurrence of a serious safety problem or hazard, by reprimanding employees who made such a mistake (Zhao et al, 2022).

Wei and Kuo (2023) describe leaders as guiding light on the sea; who are expected to direct subordinates when they are faced with problems that may arise from the changing environment with the objective of creating a future. To them, Leadership is very essential in the current volatile world. Whatever approach to leadership (trait, behavioral or contingency), they have all indicted that organsational leadership projects a picturesque of possible performance. Safety leadership for safety performance is not exempted from this. Safety leadership in another strand is seen by, Stiles et al. (2018) as a pivot of hard work among team members towards efficiency, effectiveness and performance. It saves as a basis for assuring organisational safety and clearly an element or practice of management that can strongly lure employees to not just understand its importance but to practice safety in its entirety (Kerin, 2022)

According to Lu and Yang (2010) and Wu et al (2016), safety leadership can be looked at from dimensions such as safety motivation, safety concern and safety policy. They highlighted that safety motivation and safety concern are all about transformational leadership style and on the other hand safety policy looks at the transactional leadership style. Hollnagel (2012) added that it can also be regarded from the perspective of managements pro-activeness or reactiveness

Safety Motivation: The point is that the motivational dimension encourages employees' safety behavior in the workplace through rewarding and praising work safety behavior, setting up safety incentive systems, advising on safety and encouraging employees to always participate in safety decision making. Wu et al describe these mentioned characteristics of the motivational dimension as inspirational, which clearly is synonymous to the transformational style of leadership (Lu and Yang, 2010).

Safety concern: It refers to the extent to which a leader is a role model to workers; how he stresses the importance of the use of safety equipment; emphasizes his interest in acting on safety policies, is concerned about safety improvement; and works as a team with all parties to solve safety issues (Lu and Yang, 2010).

Safety policy dimension: Regarding this dimension, it was suggested by Lu and Yang, that the employer needs to create a clear mission, assign responsibilities and goals so that standards of safety behaviour and safety systems that can assess this behavior can be set. Being akin to the transitional style of leadership, Wu et al perceive safety policy dimension of leadership as focused to contingent reward and management by exception, which are all facets of the transitional leadership style.

Safety Climate

It is common place to find some authors want to see safety climate as synonymous to safety culture, however related, there is some difference between the two concepts. Safety culture is about a set of beliefs in the organization, while safety climate includes the effects of environmental factors on these beliefs (Gadd, 2002). Safety climate is defined by Neal et al (2000) as a form of organisational climate that is specific to it, with a description of employees' individual perceptions of how they value safety in that work environment. Going by the view of Mearns and Flin (1999) safety climate projects a "snapshot**"** of how workers perceive the common and visible aspects of organizational culture at a given moment. In agreement with Neal et al and Mearns and Flin, Wiegmann et al. (2004) pointed out that safety climate could be taken for a psychological phenomenon, which could be defined as employee perceptions of the state of safety at a particular time. They saw that safety climate could somehow have a close concern with intangible issues like situational and environmental factors, The further pointed that safety climate can be a temporal phenomenon, just "snapshot" of safety culture, given that it isrelatively unstable as compared to safety culture, with constant change. In support of wiegmann, Cox and Flin(1998) had earlier described Safety climate, as a transient mood state, a state which often changes based on the diktats of the external events and pressures at work. One can hereby hold that safety climate is the psychological state of the employees on the safety culture dynamics in an organisation in regards to the current external environmental dynamics of the organisation

According to (Pecquet, 2013), safety climate can be looked at from many dimensions, some of which are teamwork, work pressure, employee competence.

Work pressure arises when there is some glaring disproportion between a worker's abilities and experiences and his job demands (De Jonge and Dormann, 2017). Work pressure has so much to do with an employee's behaviour at work, given the confusions or the laxity that may exist at a time.

Employee competence looks at the ability of the employee to work, the experience, professional background, knowledge. These aspects affect his interaction with colleagues, superiors and subordinates. This competence based behaviour has so much to do with the employees' safety and that of the organisation, an issue that points at the safety climate in place.

Individual perception of risk: According to Hertanto et al (2023), individual perception risks in their work environment envisages that the said individuals do have some common and a feeling of responsibility in safety matters within the organisation. They further highlight that every individual normally would have his or her beliefs about the possibility of experiencing a work accident. These beliefs put them in a position of managing risk by either following procedures as required or managing incidents in the right way.

Safety Communication

When information and meaning are transmitted from one individual or group of people to another individual or group with comprehensive feedback can be referred to as Communication (Guffey and Loewy 2010). Communication is only effective when there is a comprehensive feedback from the decoder of information. According to Dainty et al (2007) the communication process is characterized by elements such as; sender, receiver, noise and distortion, message, communication channels, communication media, feedback, and context. The definition of communication often varies based on context and perspective. Safety communication happens in a context where rules, tools, procedures and processes are expected to be routinely followed by employees with the aid of information to avert risk or danger. Safety communication like other forms of communication is also a two-way process wherein the communicator sends and receive safety-related messages through particular channels and gives feedback that might have distortion by noise and/or work context (Dainty et al. 2007; DeVito 2010). According to the UK Health and Safety Executive (HSE) (2005); Al-Bayati et al (2016), effective safety communication has three directions, which are; from management to frontline workers (top-down communication), from frontline workers to management (bottom-up communication) and among co-workers (horizontal communication). Based on such previous studies as Al-Bayati et al and Weaver (2007), effective safety communication can therefore be held as the existence of relevant and correct safety-related information smoothly flowing within the three directions of communication, when it is being successfully encoded, delivered through appropriate channels, received, and properly decoded and understood by receivers. Therefore, communication can be perceived as effective flow of information with the aid of these five items (Gudykunst and Nishida 2001)

Lumker (2012) holds that safety communication can be measured from the dimensions of communication climate, personal feedback, and horizontal safety communication, communication mechanism etc

Communication climate: Communication climate is about communicative phenomena or atmosphere within the organisation. It looks at issues such as perceptions about things like the managements' receptivity to employees or on how accurate information is being disseminated among and between employees in the organization (Dillard et al., 1986).

Personal feedback: Employers need to give feedback on employees' general safety behaviour and output because behaviours that result in industrial accidents are often common (Vredenburgh, 2002). Employees' contribution in safety communication must therefore be shared with them through feedback in casual communication, safety meetings. Management must keep sharing this feedback as and encouragement for employees to share information, hence reducing the common tendency of employees or same management holding information , concealing or distorting facts that can be safety-helpful . Feedback must be given to employees

Horizontal and safety communication: Horizontal safety communication envisages informing of co-workers at same organisational level about the existence of a potential safety and risk in the workplace (Lundgren and McMackin, 2009). According to Laughery (2006), warnings about potential danger for example are safety communications. Warning purpose can be shown from perspectives such as safer world, provide information, influence behavior, and reminder. This communication that happens among peers always depends on the type of activity and the mechanism in place

Safety Risk Perception

In an organisation, employees are not able to predict the future change of the elements that constitute the environment due to the uncertainty of external information or they do not know well the relationship

between the elements, thus they must always perceive risks at work (Hamid, 2020). The Oxford English Dictionary defines risk as 'a chance or possibility of danger, loss, injury or other adverse consequences', this particular definition of at risk is 'exposure to danger'. In this context, risk is used to signify negative consequences. A third possibility is that risk is related to uncertainty of outcome. Based on this necessity to predict risk, Kapuściński and Richards (2016) defined risk perception as a process in which people do make "subjective" judgments about an event due to the influences of daily life. The event to them is an unknown occurrence that can come from the environment and/ or their working elements. According to Rahul (2023) risk perception can be defined as people's judgments and assessment of hazards that might pose immediate or long-term threats to their health and well-being. It refers to people's subjective judgments about the likelihood of negative occurrences such as injury, illness, disease, and death. Risk perception is important in health and risk communication because it determines which hazards people care about and how they deal with them. Still in line with Rahul, Leder et al (2019) had earlier defined risk perception as a judgment about negative results that are based on the conversion of probability to symbols or signs. They pointed that such judgment is often influenced by individual attributes, previous experience, information processing abilities, the severity of an event, willingness, and control abilities.

The common principle by Ghahramani and Abbasi (2016) is that an increase in the level of an employee's risk perception leads to an increase in the incidence of positive safety behaviors and a reduction in the incidence of accidents. This principle was put forward because many studies came to the conclusion that unsafe behaviors are the major cause of occupational accidents and poor or incorrect perception of a workplace's risks (or even the lack of risk perception) is a factor that seriously contributes to the incidence of occupational accidents (Neissi et al, 2013, Ghahramani and Abbasi, 2016; Jahangiri et al, 2013, 2017). According to Perpina et al (2019) risk perception is divided into five factors types, which are physical environment, loss and compensation, individual socioeconomic attributes, social trust, and mentalities

Commonly, risk perception measures focused primarily on cognitive evaluation of risk. However, some recent models of risk perception have been focused on 1) deliberative and 2) affective or experiential dimensions (Ferrer and Klein, 2015). These dimensions have been taken from dual-systems theories of decision making, which distinguish deliberative from heuristic processes (Portnoy et al., 2014; Slovic et al., 2010).

Deliberative risk perceptions are described by Ferrer and Klein (2015 as systematic, logical, and rule-based. They see **affective** risk perceptions as the emotional response associated with risk. They consider worry or anxiety about a threat as an effective response. **Experiential** risk perceptions are referred to as heuristics (rapid judgments) made by integrating deliberative and affective information

Safety Behaviour

Organisations must know whether invested resources on employee safety produce expected effects. This can only be known by conducting a safety performance evaluation for management to understand the merits and demerits of implementing a workplace safety plan. Scanning employee behaviour to know where from and how disasters can come into the organisation is of utmost importance for the implementing of a workplace safety plan in the organisation. It will be wrong to stay quiet and act only when disasters or accidents have been reported; for an organization without occupational disasters does not necessarily have a good safety performance (Wei and Kuo, 2023)

According to La Barbera and Ajzen (2021) Safety behavior at work comes from the presumption that employee bahviour intentions predict behavior. They argue that these individual intention behaviours are predicted by three factors, which are attitudes, subjective norms and perceived behavioural control. Attitude reflects safety compliance while subjective norms and perceived behavioral control are a reflection of safety participation. In his work, Hussein, (2017) defined attitude as the characteristics of a person, which could project either a positive or a negative behaviour or a reflection of feeling and knowledge of safety practices in the workplace. Subjective norm is explained by Ham et al (2015) as the expectation that supervisors and co-workers (essential people) will accept and support work health and safety practices. They argued that subjective norm is an employee behavior prediction that depends on societal pressure from supervisors and

co-workers. They defined 'essential people' as people who obey work ethics, health and safety practices in the work place and are motivated to adhere to work place safety rules and regulations. According to Chen et al (2021), perceived behavioural control looks at the extent to which employees believe that it is their choice to showcase some safety behavior at work. Here, the employee performs safety practices if he believes there are safety resources or equipment to showcase safety behavior. Many employees may not showcase safety behaviour if no safety equipment is available, despite the fact that they had formed a positive attitude towards it or even knowing that other essential people will approve it (Hamid et al., 2019). According to Neal et al (2000), Griffin and Neal (2000) and Christina et al (2012), safety behavior can be defined as a combination of safety compliance and safety participation. Zara et al (2023) look at safety bahaviour from the perspective of employee commitment and added the dimensions ofsafety knowledge, safety motivation etc.

From its definition, safety behavior can be looked at from the following perspectives, which are safety compliance and safety participation. Safety knowledge and safety motivation (Griffin & Neal, Christina et al and Zara et al)

Safety compliance: Christina et al (2012) explained that safety compliance is concerned with working according to the health and safety regulations in place and working in a safe manner. To them Safety compliance stands for the main safety procedures that employees respect in order to maintain workplace safety, such as the strict respect of safety rules and procedures alongside the effective and efficient use of personal protective equipment (PPE). Griffin and Neal further saw that employee individual behaviours could be one of the aspects of safety compliance; one that could improve on their personal safety and and which is a part of their work role.

Safety participation: On the other hand Griffin and Neal (2000) defined safety participation as behaviours that have no direct effect on workplace safety, which however support in creating a working atmosphere that supports safety, Such behaviours are voluntary participation in safety activities and/or attendance of safety meetings and drills. Vinodkumar and Bhasi, (2010), continued to posit that safety participation also included behaviours that support organisational objectives and goals in this area and therefore appear more voluntary in character than safety compliance. To Clarke (2006), safety participation is more about employee organisational citizenship behaviour, since it includes actions that are not just within the employee's formal role but beyond that. According to Zhao et al (2022, 3) safety participation is '…..the behavior of grass-roots employees to voluntarily participate in the work safety of an enterprise, such as participating in safety activities, attending safety meetings, taking the initiative to put forward safety improvement suggestions, and helping co-workers to stay away from risks among other safety-related behaviors...' Curcuruto et al. (2015) detailed safety participation into two divisions; safety pro-social behaviour and safety initiative behaviour, based on the focus of an action. According to them, prosocial bahaviour is the social behaviour among frontline (grass-root) employees, like help, advice and protection. Safety initiative behavior on the other hand was defined as the spontaneous behavior of employees; which can be in form of active participation in safety activities such as trainings and drills as a means to improving the safety work environment.

Safety knowledge: Given that the work performance of employees is based on their understanding, motivation and skill, they are poised to possess a good level of safety knowledge about safety practices within the organisation. Possession of this knowledge helps them to behave safely while at work (Zara et al, 2023). Safety knowledge enlightens the worker on his behaviour on, how to use safety equipment and standard operating procedures, how to maintain or improve on safety in the workplace; how to reduce accident risks, hazards and needed precaution; also on how potential hazards noticed in the work place can be reported (Rajabi et al, 2022). According to Liu et al, this can only happen if organisations conduct frequent safety trainings

Safety Motivation: It is the desire by an employee to take part in safety practices that could enhance his skills and safety behaviour (Christian et al and Rajabi et al 2009, 2022). This behaviour is measured from the perspectives of, that need for the maintenance of safe and effective practices, The making of an effort

towards the improvement of personal safety; and the reduction of the risk of work place accidents (Shea, 2020).

Some Relevant Empirical Works on the Study

Empirical literature in this study is related to the research hypothesis. It looks at existing research on the relationships between among the key concepts in the study.

The effect of Safety Management Practices Safety Behaviour

Looking for the effect of safety culture on safety behavior, Huang et al (2023) studied integrated workplace safety culture and the health belief model (HBM) to verify the impact of workplace safety culture and health belief factors on the safety attitude, safety compliance, and safety satisfaction of healthcare workers performing COVID-19 pandemic prevention behaviors. This study was done in an attempt, to propose an integrative model that explained and predicted COVID-19 preventive behaviors among healthcare workers. Cross-sectional data was gathered through a self-administered online questionnaire from 273 healthcare workers of a famous medical institution in Taipei City. After conducting Structural equation modeling analysis (SEM), the findings revealed that workplace safety culture had an impact on health belief factors, and then health belief factors had impacts on safety attitudes (behavior). In addition, safety attitude affected safety compliance, while safety compliance further affected safety satisfaction. The study showed that workplace safety climate can strengthen healthcare workers' health beliefs and further affect their safety attitudes, safety compliance, and safety satisfaction. The study attempted to propose a model of healthcare workers' pandemic prevention behaviors as a reference for medical facility administrators in real practice.

With same interest, Ni et al (2022) explored the correction mechanism of resilient safety culture on new generation of construction workers' unsafe behavior in the context of Chinese construction industry, in order to find a new way to effectively correct unsafe behavior among them. They employed an empirical study, based on confirmatory factor analysis and regression analysis with a sample of 404 new generations of construction workers in China. Results of the exploration indicated that resilient safety culture can effectively correct new generation of construction workers' unsafe behavior through job crafting and perceived work meaningfulness. Results further indicated that Job crafting and perceived work meaningfulness can play independent and serial mediating roles between resilient safety culture and unsafe behavior

Prinsloo and Hofmeyr (2022) conducted a study in sought to contribute to the body of research on organisational culture, frontline supervisory engagement and accountability as levers for enhancing organisational performance and creating sustainable competitive advantage through resilient safety behaviour in South Africa. A survey was done with the aid of a questionnaire that was answered by frontline supervisors. Inferential statistical methods were used to test the significance of differences or relationships between factors. Findings indicated that the tendency of a supervisor to hold herself and her team accountable is positively correlated with good safety behaviour and is the strongest predictor of safety behaviour when considering safety climate and supervisory engagement and supervisory accountability. It was further indicated that, safety climate is a significant contributor to safety behaviour. This study implicated that a significant influence exists between organisational culture, safety climate, supervisory accountability and safety behaviour. Supervisory engagement, although found to be positively correlated, was not a statistically significant predictor of safety behaviour.

Regarding the effect of Safety leadership on safety behavior, Subramaniam et al (2023), investigated The influence of safety leadership on nurses' safety behavior with the mediating role of safety knowledge and motivation, in the setting of a tertiary hospital in Klang Valley, Malaysia. Their hold was that high-quality safety leadership enhances nurses' safety knowledge and motivation and subsequently, improves their safety behavior (safety compliance and safety participation). Through a questionnaire, responses were gathered from 332 nurses and analyzed using SmartPLS. Analyses revealed that Safety knowledge and safety motivation were found to directly and significantly predict nurses' safety behavior. Notably, safety

knowledge and safety motivation were established as important mediators in the relationship between safety leadership and nurses' safety compliance and participation

From the health service perspective, Hiep and Hien (2021) examined how safety leadership, workers' risk perception of Covid-19, safety motivation, and work pressure affect safety compliance and safety participation behaviors. Data was collected from 967 production workers from eight garment and footwear enterprises in Vietnam with the aid of a questionnaire. Structural Equation Modeling (SEM) technique was used to analyse the data. Results indicated that all three safety leadership factors (participative management, safety concern, and safety incentive) and risk perception of Covid-19 have a direct, positive influence on both safety motivation and worker's safety behaviors (safety compliance and safety participation behaviors), except safety incentive that does not predict safety participation behavior. Safety concern was seen to have the greatest impact on safety compliance behavior. It was further found that participative management has been identified as the most important factor affecting safety participation behavior**.**

Working on the effect of safety communication on safety behavior, Lumker (2012) investigated the impact of communication on safety behavior of 213 employees of a large industrial organization in the Netherlands. Data was collected with the aid of a closed ended questionnaire and anlysed by multiple regressions. Findings were that communication has an impact on employee safety behaviour. It was reailsed that organizational integration and perspective are significant predictors of safety participation; and that horizontal safety information influenced both safety participation and safety compliance. In another study conducted by Zhang et al (2020) to quantitatively examine the relationships among supervisory safety communication, group safety climate, and safety behaviors, as well as to qualitatively explore effective ways for supervisors to communicate safety expectations and information to workers. Data was collected through a questionnaire and by observation from among workers engaged in rail construction work in Melbourne, Australia (from 20 workgroups across 11 different worksites). Quantitative analysis showed that supervisory safety communication practices play a critical role in shaping safety climate within workgroups, which subsequently affects workers' self-reported safety compliance and safety participation behaviors. Observations identified characteristics of effective safety communication between supervisors and coworkers, such as regular engagement, consistent messages and actions, active listening, approachability, personal messages, and respectful delivery

It is important and relevant to note that Martina and Suarnianti (2018) analyzed the determinants of healthcare workers' safety behavior in hospital. The independent variables used were management commitment, management communication, employee involvement, risk response appreciation, work pressures, rules and procedures, work environment and supervision environment. Data was collected from 120 employees of two hospitals and logistic regression analysis was done. Results pointed that, safety behavior in hospital was influenced by sex, management communication, employee involvement, and work pressures.

An employee's behavour in regards to risk in at work is generally borne of his apprehension of the working environment at the time, which is sanctioned by safety management practices. Though the physical work environment may be constant for some longer time, the work dynamics are associated to constant change as the employees also seek to innovate individually and collectively for quality processing. These dynamics are associated to changes in behaviours, one of which is safety behaviour. Tracing how on safety behaviour is a dependent on the dynamic and constant environment is very vital for industries as a means to shaping the risk of incurring fatalities at work.

The effect of Safety Management Practices on Safety Risk Perception

An exploration of the relationship among safety leadership, risk perception, safety culture, and safety performance (behavior) was done by Wei and Kuo (2023) among military workers in Taiwan. Multiple hierarchical regression analyses were done with data that was gathered through convenient sampling with the aid of a questionnaire from 725participants. Results of this exploration showed that the more deeply military volunteer soldiers sense safety leadership, the clearer their risk perception will be and the more helpful it would be in achieving safety performance. This proved that safety leadership does have an effect

on employee safety risk perception and safety behaviour. They mentioned that risk perception can serve as a mediator while safety culture can mediate the relationship between safety leadership and safety performance. Before then, a study was conducted by Oah et al (2018) to identify the influence of workers' perceived workload, accident experiences, supervisors' safety leadership, and an organization's safety climate on the cognitive and emotional risk perception, among Korean workers. With the aid of a randomly sampled questionnaire, valid data was provided by 376 employees. They used correlation analysis and hierarchical regression analysis to test the hypothesis. Results indicated that workload and accident experiences have a positive influence and safety leadership and safety climate have a negative influence on the cognitive and emotional risk perception. Workload, safety leadership, and the safety climate influence perceived risk more than accident experience, especially for the emotional risk perception. According to these findings better safety leadership, leads to lower risk perception. It was recommended that supervisor safety leadership behaviors (site visits, feedback, safety communication, etc.) should be promoted for reducing risk perception.

Working on the effect of Safety climate on safety risk perception, Cao et al (2026) examined the association between safety climate and occupational health risk perception among 282 smart grid workers through a two way longitudinal survey in Germany France, the Netherlands and Sweden. Analyses showed that safety climate is positively associated with occupational health risk perception. Earlier on, Pandit et al (2019) also explored the relationship between safety climate, hazard recognition and safety risk perception among 280 workers from 57 construction sites in the US. Findings proved that the effect of safety climate on safety risk perception is indirectly mediated by hazard recognition and that there is also a direct positive effect of safety climate on safety risk perception.

In regards to the effect of safety culture on safety risk perception Calim et al (2026) in an exploratory work evaluated workers' risk perception and safety culture in a furniture manufacturer in Portugal among 103 workers. Results from data collected through a questionnaire showed a positive relationship between safety culture and safety risk perception among these workers. Before then Zhao et al (2021) investigated the impact of safety attitude, safety knowledge and safety leadership of chemical workers' risk perception in China. SEM analysis of data collected from 287 workers revealed that safety attitude and safety leadership have a direct positive impact on safety risk perception while knowledge has no direct positive impact on safety risk perception. Findings are rife that safety management practices have an important role to play on employees risk perception but the challenge stays on the nature extent of the role play. It is also very vital to point that these roles may not only vary by nature or extent but could be relative with the type of industry society and time.

The Effect of Safety Risk Perception on Safety Behavior

In a study by Wang and Xu, (2022) aimed to go a step further to understand on how risk perception can affect safety behavior and on how job satisfaction and social support may influence that relationship, based on the job demands resources theory. Data was collected from 356 frontline construction workers from 12 construction sites in Chengdu, China and analysed though descriptive and correlation analysis. The study revealed that risk perception can be a "challenge demand" that improved safety compliance, and a "hindrance demand" that reduced job satisfaction. Contrastively, it was found that risk perception had no direct influence on safety participation. Job satisfaction suppressed the relationship between risk perception and safety compliance, while it mediated the relationship between risk perception and safety participation.

In another study, Al-Bsheish (2024) investigated the role of safety training as a mediator in the relationship between risk perception and safety behavior, as measured by compliance and participation in safety measures in a big private hospital in Saudi Arabia. This was done through a survey of 155 non-medical staff and data was analysed using the most recent iteration of Smart Partial Least Squares (PLS4). Findings were that Safety training served as a full mediator in the link between risk perception and safety compliance. But, safety training did not mediate in the relationship between risk perception and safety participation. A partial mediation of training if it fully mediates in the link between risk perception and one of the dimensions of safety behaviour (safety compliance) but fails for the other (safety participation). One may say that there is a link between safety risk perception and safety behaviour; whether mediated or not.

The Mediating Effect of Safety Risk Perception on the Effect of Safety Management Practices on Safety Behavior

Earlier on, Liu et al (2022) explored whether risk perception mediated the relationship between handover quality and safety behavior among psychiatric nurses. Through convenient sampling, they recruited 186 registered psychiatric nurses in a Chinese hospital for the study. Hayes' PROCESS macro was used to evaluate the mediation of risk perception between handover quality and safety behavior. Results showed that risk perception could partially mediate between handover quality and nurses' safety behaviors. From the perspective of safety climate, Sappleton and Taveira (2025), tested the mediating role of risk perception in the link between safety climate and safety behavior of 463 Jamaican water utility company employees. Regression analysis proved that employee perception of accident frequency and risk control partially mediated the relationship between safety climate and safety behavior. They held that this mediation really has to look partial because supervisors must be held accountable for effective management practices in exerting effective safety behavior in the organization.

Ghaleb and Piaralal (2025) explored the impact of sense of control, psychological distance and safety climate on safety behaviours with the mediation of risk perception among nurses. Through a structured questionnaire, data was collected from 203 nurses through convenient sampling. SEM analysis proved that sense of control, psychological distance and safety climate have a positive effect on safety behaviour; and that risk perception has a positive effect on safety behavior. It was also confirmed that risk perception mediates the relationship between sense of control, psychological distance and safety climate and safety behaviours. A safety management practice could be in one form or the other, a a cause or mediator to others for a particular safety behaviour to appear. It is very special to realize that most of the safety management practices are objective to the working environment while, safety risk perception is subjective of a human person and depends on how the individual apprehends the working environment. Given that individual difference is one of the fundamental concepts of human behaviour, there is bound to be some variance in the way every individual who apprehends the realities of the working environment and hence their behaviour. This variance could be reflected in their perception of safety risk.

Research Gap

It can be realized from the above empirical works that so much has been written about occupational health and safety and cutting through many industries that exist also in Cameroon. One of the industries that really has so much to do with occupational health and safety, not just for customer sake but strongly for that of the employee is the heath service industry. Very little has been done about occupational health and safety in Cameroon and particularly for Kumbo and Bui division of the Northwest region that is host to three giant hospitals and a host of health centres. Looking at most of the recent empirical literature, mediation has often been used to investigate the influences and relationships of the variables in study; very few studies have used safety risk perception which is objective of a human person for mediation in studying these relationships. This study will investigate the influence of safety leadership, safety culture, safety climate and safety communication on safety behavior with the mediation of safety risk management in Kumbo East Health District of Cameroon

METHODOLOGY

Scope and Area of Study

Scope of the Study

This study is delimited by content, participation, geographically and by time. Content wise, it only looks at the concepts of safety culture, Safety leadership, safety climate, safety communication and safety behaviour. Participants are only the employed staff of the integrated health centers in Kumbo east health district. Geographically, the study is limited only to health centers of Kumbo east health district that are integrated to the Kumbo District Hospital. It took a period of one month to conduct this study.

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Area of the Study

Kumbo is the capital of Bui Division of the northwest region and has a population of about 127,919 people (Kumbo Municipality, 2016). Kumbo is host to two health districts, Kumbo east and Kumbo west health districts. Kumbo east health district in particular covers two full subdivisions (Jakiri and Mbven) and parts of two other subdivisions (Kumbo central and Nkum) of Bui division of the northwest region of Cameroon. This health district is carved into 45 health areas with 36 health facilities owned both by the government of Cameroon and private investors. 17 of the health centres are integrated to the Kumbo district hospital and owned by the Cameroon ministry of public health with a staff capacity of 164 employees

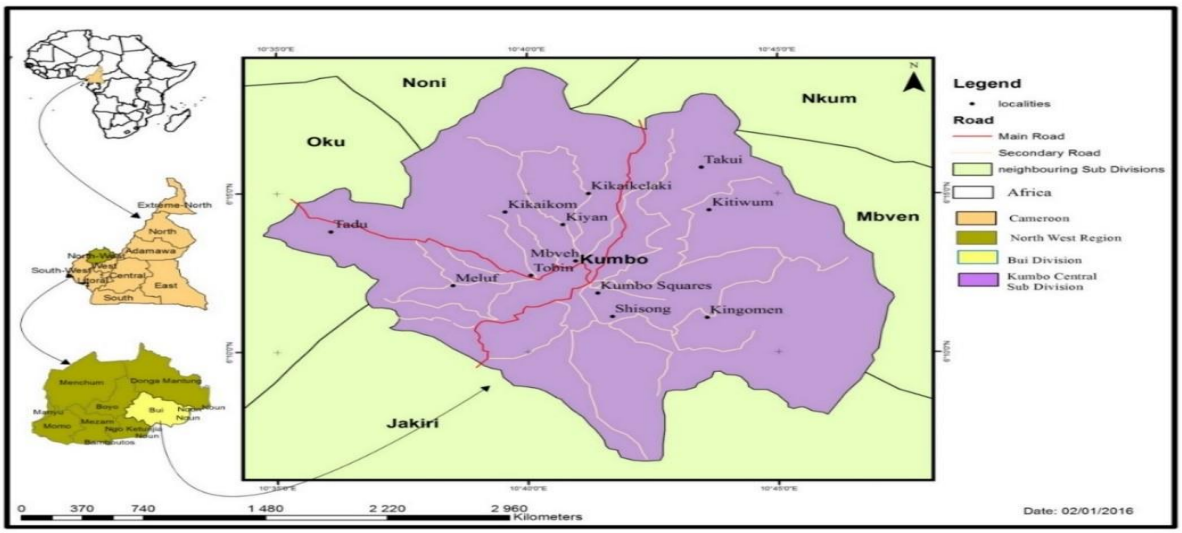

Figure 2. Map of Kumbo showing areas of Kumbo East Health District

Source : Mohammed and François (2020).

Research Design

The study used the cross-sectional causal research design, which was quantitatively designed with data collected from primary sources. Questionnaires were used as the main tool for data collection. Collected data was quantified, coded an keyed in the statistical package for social sciences (SPSS)version 22 software to obtain the quantitative data. After coding the data into SPSS, the data was subjected to the cleaning process. This design was used to test the three objectives of the study, which are: the effect of safety management practices on safety behaviour, the effect of safety management practices on safety risk perception, the mediating effect of safety risk perception on the relationship between safety management practices and safety behaviour. The items on the questionnaire were structured into five Likert scales namely:stringly agree, agree, neutral, disagree, strongly disagree. After the collection exercise, the data was quantified using SPSS.

Data Collection

Population

According to Polite and Hungler (1995), population is defined as the sum total of participants that conforms to the designated set of specification. This section seeks to specify the aggregate of items or persons from whom data, pertinent to the study were collected and the population to whom the findings of the study were generalised. For this study therefore, the population of the study consists of the 164 staff of the integrated health centres of Kumbo east heath district. It targeted mainly doctors, nurses, laboratory technicians, pharmacy attendants and cleaners.

Sample and Sampling Method

Purposive sampling was used to collect data, whereby all the 164 employees who are currently working in the integrated health centres of Kumbo east health district were given an opportunity to answer the questionnaire with consent. This method was used because it would provide every member of the target population the opportunity to participate. However, those unwilling to participate were not being coerced by any means to do so. Data was successfully collected from 146 of them.

Instrumentation and Data Collection

A closed ended questionnaire was used to collect data. This questionnaire was divided into three parts. Part one contained the demographic information of the respondent which consisted of age, gender, level of education, type of job and experience of service in Kumbo east health district.

Part two consisted of questions related to the independent and mediating variable(s) (safety culture, safety leadership, safety climate safety communication and safety risk perception). Each of the variables carried questions based on the dimensions in study. Safety culture questions were based on the dimensions of management commitment, work environment and involvement of employees (Naji et al, 2021). Questions on safety leadership were based on the dimensions of safety motivation, safety concern and safety policy (Lu and yang (2010). Those on safety climate were based on the dimensions of work pressure, employee competence and safety rules and procedures (Pecquet, 2013). Safety communication was measured from the dimensions of communication climate, personal feedback, and horizontal safety communication (Lumker, 2012). Safety risk perception was targeted from the dimensions odf deliberative, affective and experiential (Ferrer and Klein, 2015)

And part three carried questions concerning the dependent variable, safety behaviour. Questions were based on the dimensions of safety compliance, safety participation, and safety knowledge and safety motivation (Griffin & Neal (2000), Christina et al (2012) and Zara et al (2023). The questions were measured on a 5-point Likert scale, ranging from 1, "strongly disagree" to 5, “strongly agree". Data was collected within 2 weeks.

This questionnaire was administered on a face-to-face basis by the researcher. The researcher visited these health centres and administered them. Copies were left for employees that were not present at work and were collected after, while some respondents preferred to answer the questionnaires later. Most of them were answered in the presence of the researcher.

Model Specification

In this study, three variables were considered, which are the independent, the mediating and the dependent variables. The independent variables consisted of safety management practices of safety culture, safety leadership, safety climate and safety communication; the mediating variable was safety risk perception while the dependent variable consisted of safety behaviour. In addition, in order for us to estimate the relationship between safety management practices on safety behaviour, we applied the multiple correlation models. This model then enabled us to estimate the relationship of independent variables, which are safety management practices, in accordance with the dependent variable, which is safety behaviour in the integrated health centers of Kumbo East health district.

Empirical Findings

Table 1 presents the summary of descriptive statistics of variables used in the paper. It should be noted that all the indexes are constructed using multiple correspondence Analysis (MCA) given that the primary indicators of the variables are all categorical in nature. Furthermore, the indexes are normalized for easy interpretability using the min max formula ($\text{Normalised index} = \frac{\text{Raw index} - \text{Minimum}}{\text{Maximum} - \text{Minimun}}$). Found in the table are the number of observations, mean values, standard deviation, minimum and maximum values of each variable.

Table 1: Summary of descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Safety behavior index	146	0.4904801	0.27307	0	1
Safety risk perception index	146	0.3587517	0.2611153	0	1
Safety management practices index	146	0.4005841	0.2740187	0	1
Safety culture index	146	0.5495726	0.2749583	0	1
Safety leadership index	146	0.3709543	0.3092557	0	1
Safety climate index	146	0.2566682	0.2279635	0	1
Safety communication index	146	0.2033419	0.1714307	0	1
Gender					
Male	146	0.3219178	0.46882	0	1
Female	146	0.6780822	0.46882	0	1
Experience					
Less than 2 years	146	0.2054795	0.4054424	0	1
2 – 5 years	146	0.3082192	0.4633472	0	1
6 – 8 years	146	0.1780822	0.3838989	0	1
More than 8 years	146	0.3082192	0.4542353	0	1

Source: Author computation

This study analysed primary data from 146 health workers in integrated health centres of the Kumbo East Health District using OLS regression to examine the relationships among safety risk management practices, safety risk perception, and safety behaviour. The safety behaviour index had a mean of 0.490 and a standard deviation of 0.273, indicating that safety behaviour among the sampled health workers was at a moderate level. Notably, the safety risk perception index had a mean of only 0.359 (SD = 0.261), and the safety management practices index had a mean of 0.401 (SD = 0.274), both below the midpoint. Among the disaggregated dimensions, the safety climate index (Mean = 0.257, SD = 0.228) and the safety communication index (Mean = 0.203, SD = 0.171) were the weakest, while the safety culture index was comparatively highest with an average of 0.550 and a standard deviation 0.275.

Demographically, female respondents constituted 67.8% of the sample and males 32.2%. Regarding work experience, 30.8% had 2–5 years and another 30.8% had more than 8 years, while 17.8% had 6–8 years and 20.5% had less than 2 years.

These descriptive results resonate with the broader state of safety practices in Cameroon's health system. Cheuyem et al. (2025), in a study of the obstetrics–gynaecology department of a referral hospital in Yaoundé, found that health workers' median hand hygiene knowledge score was only 60%, and 59% of respondents had experienced body fluid exposure in the past 12 months. Similarly, Dzekashu et al. (2016), studying medical waste management in the Kumbo East and Kumbo West health districts, found that waste

management practices fell far short of standards: only 6.6% of health facilities possessed the national policy document, and no facility kept management records. Together, these regional findings point to a systemic problem: safety infrastructure and practice standards are generally weak across Cameroonian health facilities.

Table 2: OLS results with aggregate safety management index

	(1)	**(2)**	**(3)**
VARIABLES	**SBeh**	**SRP**	**SBeh**
Safety risk perception index			-0.469***
			(0.0777)
Safety management practices index	-0.377***	0.341***	-0.217***
	(0.0775)	(0.0753)	(0.0742)
Gender (1 if female & 0 if male)	0.0125	-0.0418	-0.00710
	(0.0454)	(0.0441)	(0.0407)
Experience 2 – 5 yerars	-0.0732	0.0394	-0.0547
	(0.0601)	(0.0584)	(0.0537)
Experience 6 – 8 yerars	-0.160**	0.0773	-0.124**
	(0.0685)	(0.0665)	(0.0615)
Experience > 8 years	-0.0863	0.0360	-0.0694
	(0.0602)	(0.0585)	(0.0539)
Constant	0.711***	0.213***	0.811***
	(0.0661)	(0.0643)	(0.0614)
Observations	**146**	**146**	**146**
R-squared	**0.163**	**0.136**	**0.337**
Overall significance (Prob > F)	**0.0000**	**0.0001**	**0.0000**
Mean VIF	**1.41**	**1.41**	**1.40**
Breusch Pagan test p-value	**0.2439**	**0.5659**	**0.1249**

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Source: Author computation

According to results from Model (1) of Table 2, the coefficient of safety management practices index is negative (−0.377) and statistically significant at 1% level which implies that safety management practices index has a significant negative effect on safety behaviour. This result is thought-provoking: for every one-unit increase in safety management practices, safety behaviour decreases by 0.377 units everything else held constant. The negative aggregate effect suggests that, in the Kumbo East context, existing safety management practices may be implemented in ways that inadvertently discourage safety behaviour—for example, through compliance-oriented rather than participatory approaches, or through practices that workers perceive as disconnected from the actual hazards they face.

Results from Model (2) of Table 2 indicate that safety management practices index has a significant positive effect on safety risk perception. Based on the coefficient of the variable, a unit point increase in safety risk management index will lead to 0.341 point increase in safety risk perception index all other things held constant. This finding is statistically significant at 1% level.

This means that stronger safety management practices do indeed raise risk perception levels among health workers. This positive effect is consistent with the intended logic of safety management: when organisations invest in safety practices, workers become more aware of hazards and risks. However, as will be discussed later this heightened perception does not translate into improved behaviour.

Results from Model 3 of table 2 reveal that when safety risk perception is added to the model, it significantly predicts safety behaviour ($\beta = -0.469$, $p < 0.01$), and the coefficient on safety management practices drops from −0.377 to −0.217 though remaining statistically significant at 1% level representing a reduction of approximately 42%. These results establish partial mediation implying that safety risk perception partially mediates the effect of safety management practices on safety behaviour. The indirect effect is: $0.341 \times (-0.469) = -0.160$. The total effect is −0.377, the direct effect is −0.217, and the indirect effect accounts for 42.4% of the total effect.

The direction of the mediation is critical. In effect, safety management practices increase risk perception, which in turn decreases safety behaviour. This is a suppression or competitive mediation pattern, where the indirect effect runs counter to the direct effect. In other words, while safety management practices may have some direct negative effect on behaviour, they also operate indirectly through risk perception to further reduce safety behaviour.

Table 3 addresses the disaggregated analysis by decomposing safety management practices into four dimensions: safety culture, safety leadership, safety climate, and safety communication.

Table 3: Disaggregated safety management practices OLS results

	(1)	**(2)**	**(3)**
VARIABLES	**SBeh**	**SRP**	**SBeh**
Safety risk perception index			0.0181
			(0.0605)
Safety culture index	0.118	0.158	0.115
	(0.0888)	(0.126)	(0.0896)
Safety leadership index	0.0632	0.225**	0.0591
	(0.0795)	(0.113)	(0.0809)

Safety climate index	-0.834***	0.746***	-0.847***
	(0.0515)	(0.0730)	(0.0686)
Safety communication index	0.673***	-0.0920	0.675***
	(0.0669)	(0.0949)	(0.0674)
Gender (1 if female & 0 if male)	-0.00826	-0.00959	-0.00809
	(0.0248)	(0.0351)	(0.0248)
Experience 2 – 5 yerars	-0.00712	0.0123	-0.00735
	(0.0324)	(0.0460)	(0.0325)
Experience 6 – 8 yerars	-0.0301	0.00254	-0.0302
	(0.0372)	(0.0528)	(0.0373)
Experience > 8 years	0.0298	-0.0276	0.0303
	(0.0328)	(0.0465)	(0.0329)
Constant	0.483***	0.0265	0.483***
	(0.0882)	(0.125)	(0.0885)
Observations	**146**	**146**	**146**
R-squared	**0.768**	**0.490**	**0.768**
Overall significance (Prob > F)	**0.0000**	**0.0000**	**0.0000**
Mean VIF	**2.24**	**2.24**	**2.33**
Breusch Pagan test p-value	**0.5510**	**0.1142**	**0.5440**

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Source: Author computation

Based on results from model (1) of table 3, Safety culture and **safety leadership** exert a positive effect on safety behaviour though both are not statistically significant. Although this finding ties with that of Subramaniam et al (2023), the non-significance of safety leadership is particularly notable, as leadership is often assumed to be a key driver of safety behaviour. In the Kumbo East context, it may be that leadership commitment is not yet translated into visible action, or that workers do not perceive leaders as credible safety role models.

Furthermore, safety climate has a significant negative effect on safety behaviour. This is the strongest predictor in the model. In effect, a unit point increase in safety climate index will lead to about 0.834 point drop in safety behavior index everything being equal. This result is statistically significant at 1% level. This disagrees with Pinsloo et al 2022, who saw that the tendency of a supervisor to hold herself and her team accountable is positively correlated with good safety behaviour and is the strongest predictor of safety behaviour when considering safety climate and supervisory engagement and supervisory accountability A

possible explanation is that when workers perceive a strong safety climate; meaning they believe safety is valued and prioritised by the organization. They may also become more aware of the gaps between projected safety values and actual working conditions. This heightened awareness of the "safety climate–reality gap" may lead to cynicism or disengagement rather than improved behaviour.

In addition, safety communication exhibits a significant positive effect on safety behaviour in Kumbo East Health District in Cameroon. Precisely, a unit point increase in safety communication index will enhance safety behavior index by about 0.673 ceteris paribus. This outcome is statistically significant at 1% level. It should be noted that this is the only dimension that positively predicts safety behaviour. Effective safety communication, characterised by open dialogue, clear feedback, and accessible information, appears to directly enable health workers to adopt safer practices. This finding aligns with the broader patient safety literature, which consistently identifies communication as a cornerstone of safety behaviour (WHO, 2025) and agrees with the study of Martina and Suarnianti (2018).

Model (2) of Table 3 addresses the effect of safety management practices on safety risk perception at the disaggregated level. Safety climate has a significant positive effect on safety risk perception at 1% level. A point increase in safety climate index will result in about 0.746 point increase in safety risk perception index. This is the strongest predictor of risk perception. A strong safety climate appears to make workers more cognisant of risks; perhaps because safety is salient and discussed, or because workers feel safe enough to acknowledge vulnerabilities. This agrees with the findings of Cao et al (2026)

Similarly, safety leadership also has a significant positive effect on risk perception ($\beta = 0.225$) at 5% level of significance. Effective safety leadership which is characterised by role modelling, guidance, and support appears to enhance workers' awareness of risks. This finding is consistent with the literature showing that leader commitment to safety increases worker vigilance (Liu et al., 2022). This cancels the position of Oah et al (2018) who held that safety leadership and safety climate have a negative influence on the cognitive and emotional risk perception of employees

Safety culture ($\beta = 0.158$) and safety communication ($\beta = -0.092$) are not statistically significant. These findings disagree with those of Calim et al (2026), who saw a positive effect of safety culture on safety risk perception. Notably, safety communication's effect on risk perception is negative, though non-significant. This suggests that communication may operate differently from climate and leadership: rather than raising risk perception, communication may reduce unnecessary anxiety by clarifying procedures and expectations.

Model (3) of Table 3 addresses the third objective at the disaggregated level. When safety risk perception is added to the safety behaviour equation alongside the four safety management dimensions, the coefficient on safety risk perception is 0.018 (n.s.), non-significant. This indicates that risk perception does not mediate the effects of the individual dimensions on safety behaviour when all dimensions are considered simultaneously.

This null mediation finding at the disaggregated level is important. It suggests that the mediating role of risk perception operates at the level of overall safety management practices, not through any single dimension. The high correlation among the dimensions (as indicated by the Mean VIF of 2.24–2.33) may also dilute the unique mediating pathways. It should further be noted that the effects of the dimensions on safety behaviour remain essentially unchanged: safety climate remains significantly negative at 1% level, and safety communication remains significantly positive at 1% level. Safety culture and safety leadership remain non-significant.

The practical implication is profound. It does not mean that risk management practices are inherently harmful; rather, it reveals that in resource-scarce health systems with weak safety infrastructure, raising risk awareness without accompanying behavioural support resources may produce counterproductive effects. When health workers are aware of risks but lack coping resources—such as adequate personal protective equipment, convenient hand hygiene facilities, or reliable vaccine access—risk perception may trigger anxiety, helplessness, or avoidance behaviour rather than protective behaviour.

This resonates with Chen et al. (2026) discussion of risk perception and safety behaviour among ICU nurses. Wang et al. developed a risk management target card intervention that simultaneously addressed risk perception enhancement and behavioural support tools, and the results showed that the two must be advanced in tandem to produce behavioural improvement. Cameroon's health system urgently needs similar integrated strategies: while raising risk awareness, it must ensure the accessibility of personal protective equipment, the free provision of vaccinations, and the availability of safety communication channels.

The mediation findings of this study contrast with Liu et al. (2022), who studied Chinese psychiatric nurses and found that risk perception partially mediated the relationship between handover quality and safety behaviour, with a mediation effect of 49.17% and a positive direction. Contextual differences may explain this divergence: in Chinese psychiatric nursing settings, higher risk perception may prompt nurses to adopt more cautious handover behaviours, whereas in resource-constrained integrated health centres in Cameroon, heightened risk perception may engender helplessness or fatalism rather than behaviour change.

Cheuyem et al. (2025) similarly observed a cognition–behaviour inconsistency in Yaoundé: although 90% of respondents considered hand hygiene an essential part of their care work, only 59% had experienced body fluid exposure in the past year, and only 27% had completed the full hepatitis B vaccination series. This "knowing but not doing" pattern corroborates the negative association between risk perception and safety behaviour found in the present study.

Takougang et al. (2024), in a study at the Bertoua regional referral hospital, found that 86.7% of health workers reported at least one body fluid exposure, yet 62% did not report the exposure event, and only 4.2% had completed the full hepatitis B vaccination series. These structural barriers may prevent heightened risk perception from translating into behaviour change, because the resources and support conditions required for behaviour change are absent.

However, findings of this work would have been generalizable if it tackled a wider scope in Cameroon with many health districts and specific types of health workers in the study. They remain a tip of the iceberg for effective occupational health management in the management of health services.

CONCLUSION

As a safety management practice leadership commitment is yet to be translated into visible action, or one may say that workers of kumbo East Health District do not perceive leaders as credible safety role models. Safety leadership, which is not just an objective safety management practice like safety climate and safety culture is subjective and drives the latter. When leaders are not perceived as credible role models in a safety climate and culture, the effect of these safety management practices may not be felt in behaviour as expected in a working environment. Safety communication may reduce unnecessary anxiety by clarifying procedures and expectations on safety risk perception. The mediating role of risk perception on the effect of safety management practices on safety behaviour operates at the level of overall safety management practices, not through any independent safety management practice. It can therefore be noted that when health workers are aware of risks but lack coping resources—such as model leadership, adequate personal protective equipment, convenient hand hygiene facilities, or reliable vaccine access—risk perception may trigger anxiety, helplessness, or avoidance behaviour rather than protective behaviour. Health service management in Kumbo East Health District would therefore have to improve on its safety leadership practices and provision of safety resources to acquire very significant and related safety management practices, safety risk perception and safety behaviour among employees. Proactively, this could be realized through effective and constant safety training.

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