

# Implications of Occupational Health and Safety Intelligence in Nigeria

Akeem Ayofe Akinwale<sup>1</sup> and Olasunmbo Ayanfeoluwa Olusanya<sup>2</sup>

## Abstract

Health and safety risks abound in many organisations in developing countries, despite availability of various health and safety policies. This situation produces adverse consequences for employees, organisations, and society. This article examines the implications of occupational health and safety intelligence in Nigeria, based on a cross-sectional research design and risk society and sense-making theories. The secondary and primary data used for the article were derived from a systematic review of the literature and 15 in-depth interviews among managers and senior staff members of selected organizations in Lagos state, Nigeria. The data were subjected to content analysis and ethnographic technique. Findings revealed a high level of awareness of the importance of occupational health, inadequate investment in safety intelligence programmes, and prevalence of occupational hazards in various organisations. The prevalence of hazards in some organizations signaled the inadequacy of occupational health and safety programmes in Nigeria. Managers and employees are susceptible to occupational health hazards, with adverse implications on man-hours, productivity, and job security. The findings show the need for adequate investment in precautions and occupational medicine in Nigeria.

**Keywords:** Development; occupational medicine; organizations; safety; training

---

<sup>1</sup> Senior Lecturer, Department of Industrial Relations and Personnel Management, University of Lagos.

<sup>1</sup> Assistant Lecturer, Department of Industrial Relations and Personnel Management, University of Lagos.

**Corresponding author**

Akeem Ayofe Akinwale: aakinwale @unilag.edu.ng

# Implications of Occupational Health and Safety Intelligence in Nigeria

---

Safety risks are numerous across organisations in developing countries; such risks may include Ebola virus disease (EVD), human immunodeficiency virus (HIV), acquired immune deficiency syndrome (AIDS), hepatitis B virus (HBV), tuberculosis, thrombosis, meningitis, outbreak of fire, flood, excess workload, fatigue, industrial accident, industrial disease, and other forms of occupational hazards. These risks require more attention than the available precautions in many organisations in Nigeria.

The first indication of a safety risk can be an incident, like the case of Patrick Sawyer, the first known carrier of Ebola virus in Nigeria. Ebola virus disease is so dangerous that it multiplies and kills its hosts in few weeks; the virus is a reminiscence of the 14<sup>th</sup> century bubonic plague – the Black Death – that killed over 50 million people in Asia and Europe. Unfortunately, some Nigerians, especially health care workers (HCWs) and persons in the aviation industry got Ebola virus from Patrick Sawyer due to negligence and ignorance. Unarguably, Ebola virus disease is among occupational health hazards for workers in the health care sector and other organisations.

Occupational health encompasses different aspects of workers' health, including the physical, mental and social wellbeing of workers in various organisations. Occupational health and safety (OHS) has become a major social policy in several countries, owing to its importance. The British Government established Occupational Health and Safety Act (OHSA) in 1974 (Hutter, 1993). The United States of America reinvented its OHSA in 1995. Similarly, Australia, Norway and Sweden renewed their policies on occupational health and safety in the mid-1990s (Gunningham, 1999).

As reported by Westerholm (1999), most countries of the European Union have established occupational health and safety services. Also, most countries of sub-Sahara Africa have some legislative provisions for physical injuries and disabilities sustained in the course of work; examples include: the Compensation for Occupational Injuries and Diseases Act of South Africa, the Work Injury Benefits Act of Kenya, the Injuries Compensation Act of Gambia, and Employee Compensation Act (ECA) of 2010 in Nigeria (Atilola, 2012; Idoro, 2011). The common features of occupational health and safety appeared in Westerholm's (1999, p. 626) description of OHS as follows:

The management of health and safety implies establishing and operating a system for (i) the prediction and identification of workplace risks and their avoidance, (ii) risk assessment, (iii) appropriate action for the removal or, alternatively, effective management of risks, (iv) activities to monitor and supervise health and safety at the workplace, and (v) the adequate training and competence development of all staff.

An important practical issue in occupational health and safety is an understanding of workers' behaviour regarding workplace hazards (Marchand, Simard, Carpentier-Roy, & Ouellet, 1998).

Safety behavior has at least two dimensions, carefulness and initiatives. Carefulness refers to workers compliance with safety rules, while initiatives consist of workers' actions to improve the safety of the work environment. Expectedly, employees are increasingly aware of an occupation's effect on their health. Thus, the control of the industrial environment will give the employee a meaningful and easily visible working of the concepts of preventive medicine and preventive measures (Siegel, 1964).

Studies have shown that health care workers are at increased risks of contracting blood-borne diseases or occupational injuries (Amira & Awobusuyi, 2014; Ogoina, Pondei, Adetunji, Chima, Isichei, & Gidado, 2014). Besides, different categories of workers are prone to occupational hazards in many organisations with the availability of a multitude of health hazards, such as biological, chemical, physical, and psychological hazards, although the work environment is expected to be safe and healthy.

Unfortunately, some employers assume little responsibility for the protection of their workers' health and safety. This negates the provision of Convention 155 of the International Labour Organisation (ILO), which mandates occupational health and safety. The Convention requires governments and employers to ensure adequate precautions in the workplace. However, despite the need for protection of health and safety of workers, occupational hazards abound in developing countries, including Nigeria. This is due to the fact that many developing countries are yet to domesticate the International Labor Organisation (ILO) Convention on occupational health and safety, while the few that have done so lacked prerequisite infrastructure for its enforcement (Atilola, 2012).

The above-mentioned situation justifies the need to examine the implications of occupational health and safety intelligence in Nigeria. This article specifically addresses three research questions: How are occupational health and safety risks managed in Nigeria? What is the extent of investment in occupational health and safety programmes in Nigeria? Why is safety intelligence necessary for organizations in Nigeria? These questions were addressed through a cross-sectional research design, involving secondary and primary data.

Occupational health has received attention as a result of the inevitability of work and its influence on development of organisations and society (O'Donnell, Rosati, & Doorslaer, 2005). Yet, changes at the workplace have overshadowed the traditional approach to safety, thereby expanding the scope of occupational hazards. For instance, Africans have witnessed high rates of occupational hazards in different organisations. In his description of the prevalence of occupational hazards in African countries, Loewenson (2001, p. 864) noted that:

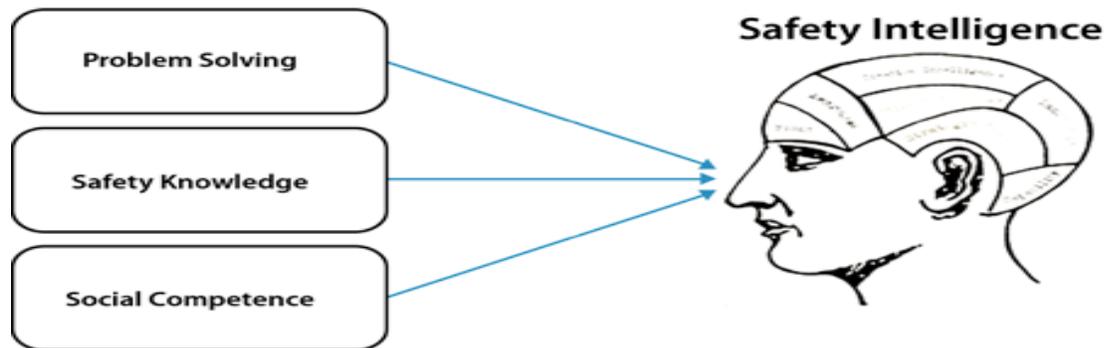
The expansion of chemical, electronic, and biotechnology industries and of the service and transport sectors has introduced new risks, widened the spread of work-related risks and increased their interaction with non-work factors in ill health, such as environmental pollution. [...] workers now also suffer new stresses, such as new asthmatic disorders, psychological stress, and ergonomic and visual effects of video display units.

Furthermore, estimates show that over 250 million occupational accidents occur annually worldwide and 335,000 of the accidents are deadly; the number of fatal accidents is much higher in Africa compared to situation in Europe and North America (Treiber, 2005). The difference is primarily due to better health and safety programmes, improved first-aid and medical facilities, and to active participation of workers in decision-making process on health and safety issues in Europe and North America. This underscores the need for more studies on occupational health and safety intelligence, especially in developing countries.

## OCCUPATIONAL HEALTH AND SAFETY INTELLIGENCE

The need for occupational health and safety has attracted attention of scholars since the early stage of industrialisation in Europe and North America from where developing countries derived their occupational health and safety management models. Several studies have shown that different categories of persons deserve a health system that improves their health status (Akinboro, Adejumo, Onibokun, & Olowokere, 2012, p. 2). This shows the importance of not only occupational health and safety devices but also compliance with safety procedures.

Amira and Awobusuyi (2014) noted that health care workers should be educated about occupational risks and safe practices, thereby showing the importance of safety intelligence (Fruhen, Mearns, Flin, & Kirwan (2014). Different components of safety intelligence are presented in Figure 1 developed by the European Organisation for the Safety of Air Navigation (Eurocontrol, 2013).



**Figure 1. The Components of Safety Intelligence**

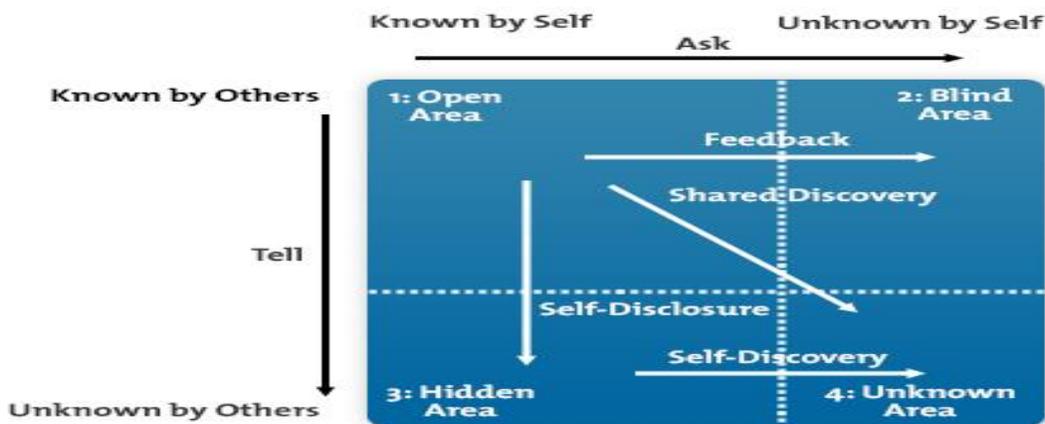
Safety intelligence deals with management of occupational health and safety through knowledge, decision-making and leadership in an organisation. It comprises safety knowledge, problem solving and social competence. Safety knowledge encompasses awareness of occupational health and safety risks, including an evaluation of occupational health and safety programmes in an organisation.

Sources of safety knowledge include incident investigation, teamwork, collaborations, and survey of safety culture. Problem solving entails specific decisions on occupational health and safety risks in an organisation. This implies decision-making for the maintenance of occupational health and safety.

Social competence entails ability to recognise the occupational health and safety needs of employees in an organisation, including perception, persuasion, and leadership responsibility in an organisation. Employee engagement is important in this regard.

Each component of safety intelligence has implications for the development of an organisation. Naderpour and Zhang (2014) noted that the hardware failure and human error in decision making could hinder the achievement of the goal of occupational health and safety, thereby increasing the likelihood of hazards.

Organisational communication is relevant for an understanding of occupational health and safety intelligence. Through the use of the Johari Window (see Figure 2), team members can understand the value of self-disclosure with an offer and acceptance of constructive feedback concerning the safety situation at the workplace.



**Figure 2. The Johari Window of Interpersonal Communication**

Enlargement of the open area of communication is the ultimate goal of the Johari window. As people share information, the open area expands and the hidden area decreases. Persons with a large open area get along well with others and promote easily the development of social competence of safety intelligence in an organisation. A lack of expansion of the open area and failure to encourage information sharing will reinforce ignorance with adverse implications on safety intelligence and problem solving.

Occupational health and safety management system (OHSMS) has received attention as a result of increase in occupational safety and health risks (Haight, Yorio, Rost, & Willmer, 2014). OHSMS covers a traditional safety and health programme, including safety training, safety inspections, safety awareness campaigns, risk assessment and organisational culture activities.

The success of OHSMS depends on effective leadership and management support, and active employee participation. The main objective of any safety and health strategy is to prevent occupational injuries. Therefore, “any effort to prevent people from being injured is worth it” (Haight, Yorio, Rost, & Willmer, 2014, p. 50).

Ojedokun and Idemudia (2014, p. 106) posit that “organizations should be able to minimize burnout among their employees by increasing their adaptive capacities through appropriate training and development workshops.”

Following their empirical analysis of occupational health and safety (OHS) practices in Nigeria, Idubor and Oisamoje (2013) noted that all organizations have a duty of care to ensure that employees remain safe at all times. Idubor and Oisamoje (2013, p. 154) justified the need to reinforce health and safety management (HSM) with reference to the following issues:

Recurrent reports of plane crashes in the aviation industry, high rates of motor vehicle accidents, numerous cases of death due to poisoning in the solid mineral sector, frequent accounts of disasters in the petroleum sector arising from oil spills, pipeline vandalism, and accidents involving petroleum tankers.

In the words of Marchand, Simard, Carpentier-Roy, and Ouellet (1998), the most commonly found safety rules in almost all organisations are related to the wearing of individual protective devices, performing tasks according to safe work methods, use of appropriate tools and equipment, housekeeping of the work station, working at a safe work place, and complying with specific safety procedures. However, the extent to which organizations comply with safety rules is yet to be clearly understood in Nigeria.

## **METHODS OF DATA COLLECTION AND ANALYSIS**

This article is based on secondary and primary data. The secondary data were derived from theoretical framework and a systematic review of the literature on occupational health and safety intelligence. The secondary data showed the existing knowledge on the subject matter of the present article. For instance, the two theories employed to analyse the issue of occupational health and safety intelligence are the Risk Society Theory by Beck (1992) and Sense-making Theory by Weick (1995).

The risk society theory reflects the driving force of occupational health and safety risks, while the sense-making theory provides a rationale for decision-making on occupational health and safety intelligence in modern organisations. Sense-making implies a higher level of engagement by the actor, as people and organizations are constantly in the business of trying to make sense of the flow of activities around them (O'Connell, 1998; Shiflett, 2000).

Beck (1992) noted that modern society is "risk society". His concept of risk covers all areas of social life, “from the insecurities of the job market to the complexities of family life, to the validation of scientific activity, and to the hazards of the environment” (Allen & Henry, 1997, p. 183; Ekinsmyth, 1999; Moraru, 2001, p. 76).

A central feature of postindustrial modernization is the proliferation of technological and environmental risks and crises, which emanate from corporate industrial activities (Shrivastava, 1995). From Beck’s perspective, risk society has produced unintended consequences, including new conflicts of interest and new communities of the endangered (Draper, 1993).

Moreover, with the use of in-depth interviews, the primary data were collected from the managers and senior staff members of selected organizations in Lagos state, Nigeria. The selected organisations include banks, pharmacies, medical centre, supermarkets, filling station, fire station, bakery, bookshop, and printing press.

A total of 15 men and women including managers and senior staff members of the selected organizations participated in the in-depth interviews (nine in-depth interviews for men and six in-depth interviews for women). All participants received information about the study objectives, hence their consent and free responses to the in-depth interviews.

The participants were selected purposively based on location, availability, position in the organisation, and experience of the subject of occupational health and safety intelligence. One manager or senior staff member was selected from each organisation. The fieldwork was conducted between April and July 2014; the interview guide utilised for data collection comprised several questions on various aspects of occupational health and safety intelligence. Each interview lasted for an average of 70 minutes. Data obtained from the in-depth interview were subjected to content analysis and ethnographic technique.

## **DISCUSSIONS**

The analysis of socio-demographic characteristics of the participants showed that the participants comprised nine men and six women. Their age ranged from 35 to 52 years. Ten senior staff members and five managers participated in the study. Their work experience ranged from five to thirty years. A close observation of the socio-demographic characteristics of the participants revealed evidence of maturity among men and women with adequate work experience. Their views on occupational health and safety intelligence in their organisations can be regarded as authoritative.

### **Management of Occupational Health and Safety Risks**

All the participants identified some hazards in their organisations, showing that occupational hazards could affect everybody irrespective of designation or employment status in the organisation. Some participants specifically mentioned that all employees were vulnerable to occupational hazards but blue collar employees could be more vulnerable than the white collar employees or management staff.

The forms of hazards were not the same in every organisation depending on the work environment and type of operations in each organisation. For instance, electricity workers may be more susceptible to electrocution, while bankers could be more vulnerable to robbery of the bank during working hours. Similarly, health care workers are more vulnerable to infections from exposure to pathogens unlike aviation workers whose lives could be in danger during plane crash. One of the participants noted that:

There are hazards and we recently had to fight the authorities for acknowledgment that these hazards abound: Doctors could get tuberculosis through consultations and hepatitis B and HIV through cannulation. Nurses face hazard while giving

injections. Those in the Laboratory deal with blood. They can get pricked by needles while emptying refuse and get infected.

The prevalence of hazards in organisations reflects the inadequacy of occupational health and safety programmes in public health planning in Nigeria. The Nigerian government has invested in the development of health care from the primary level to the secondary and tertiary level. But, occupational medicine remains an underdeveloped area of medical practice in Nigeria.

Concerning the management of occupational health and safety risks, awareness, training programmes, and seminars featured prominently in the narratives of the participants. This shows a high level of awareness of the importance of occupational health and safety among all the participants. Specifically, two-third of the participants noted that their organisations encouraged health and safety consciousness among the employees.

Some participants mentioned the availability of specific training programmes on health and safety issues in their organisations. In this case, the frequency of safety training varied from one organisation to another, although all the participants noted the importance of health and safety training programmes for all employees in their organisation. Some instances of organisational response to the issue of safety are presented as follows:

You have to make employees aware of the entire health and safety standard that exists. Also, medical tests are conducted on a quarterly basis to ensure that hygiene and safety issues do not exist. This is a regulation that must be complied with in this organisation.

We conduct specific training to deal with specific issues on the jobs so we offer technical training on occupational health and safety issues. The primary purpose of the training is to create awareness. Once you make the employees aware of health and safety standard, the next you need is to ensure compliance.

There are a total of 15 employees who work in shifts at the fire station. We normally go out to give lecture to people. In Unilag we speak to departments, we do practical and theory training. Recent examples are library, education library, faculty of sciences, Unilag water.

Compliance with universal precautions is another way of managing occupational health and safety risks. More than half of the participants noted their observation of compliance with safety precautions in their organisation. Three participants from banks noted that the International Standard Organization comes to their organisations once yearly to inspect all aspects of the bank. However, some participants gave a conditional response on the issue of compliance, as they based it on availability of safety gadgets.

### **Investment in Occupational Health and Safety Programmes**

Inadequate investment in and inadequate knowledge of the cost of investment in occupational health and safety programmes are two major themes that emerged among the participants. Only

one-third of the participants disclosed useful information on the level of investment in occupational health and safety programmes in their organisations. One of the participants reported an instance of investment in occupational health and safety:

I just approved the sum of three hundred and fifty thousand naira (₦350,000.00) for the purchase of gloves, footwear, head gear, and uniforms for about 73 employees. These devices are more for hygiene than for safety as they are already certified.

The information provided on the cost of investment in occupational health and safety programmes is however limited to expenses on occupational health and safety training programmes and provision of basic safety equipment such as gloves, gowns, goggles, and, fire extinguishers. Two managers among the participants disclosed that they had had spent up to one hundred and fifty thousand naira (₦150,000.00) per employee on occupational health and safety training programme.

Another one-third of the participants did not specify the costs of occupational health and safety devices in their organisations but they mentioned the availability of various safety devices including fire extinguishers, footwear, gloves, headgear, and uniforms. Some participants noted that the cost of occupational health and safety training programmes varies across branches of their organisations, while some participants expressed the view that the head office is responsible for occupational health and safety training materials in their organizations.

I am not sure and I cannot give reliable information on the level of investment on health and safety programme in this organisation. As a matter of fact, in our organisation major decisions are made at the headquarters. Materials on health and safety programme including training materials, come directly from the head office.

There are other gears we should have that we don't have: for the high tension, there should be insulators that we don't have, it is beyond our reach" For the inhalation of gas/smoke we should have facial masks that we do not have. We do African style. We used to have BA (breathing apparatus) we still have but it is not up to date. There are new ones now. Concern is for all equipment to work so that we will be seen as doing our work. We need fire engines. Over two years now the one we have has packed up. We also need recreation materials e.g. televisions, air conditioners, games, and DVD to watch how to fight fires.

A few participants specified the cost of some aspects of the investment in occupational health and safety programmes, with some quotations to the tune of 12 million naira. One participant noted that occupational health and safety is very expensive. She disclosed that the sum of one hundred and fifty thousand naira (₦150,000.00) would be required to purchase personal protective equipment per one employee and the sum of thirty million naira (₦30,000,000.00) would be required to make provision for 200 employees in the organisation.

Regarding the budget item for occupational health and safety in their organisations, some participants disclosed that their organisations budgeted up to five hundred thousand (₦500,000.00) per annum for occupational health and safety items. However, two-third of the participants expressed ignorance of the actual amount budgeted for occupational health and safety devices in their organisations.

### **Reasons for Investment in Safety Intelligence**

The narratives of most of the participants showed that managers and employees were susceptible to occupational health hazards, with adverse implications on man-hours, productivity, and job security. This suggests that failure to ensure occupational health and safety intelligence would create adverse effects for the employees, organisations and society.

The above finding implied that adequate investment in occupational health and safety intelligence is necessary to stimulate development of individuals and organizations. Also, a study by Siegel (1964, p. 964) showed that:

Health, its maintenance, and payment for disease and illness of all types have become direct and rising costs of doing business. [---] Industry has a great and increasingly important role in community health needs and resources.

Some participants observed that adequate investment in occupational health and safety intelligence is directly associated with organisational commitment, adequate remuneration, and job security among employees. Adequate investment in safety intelligence would enhance productivity and profitability of organisations, while it will promote the overall development of society.

Efficiency of the organisation will be compromised in the absence of occupational health and safety intelligence. And if hazards occurred, say fire outbreak, the organisation will lose property and, money intended for other things will be used to refurbish burnt buildings/properties.

The benefits outweigh the cost of investment that would have been made in the procurement of occupational health and safety equipment. If the organisation does not take this serious and there is a major problem, the issues of litigations might arise and the organisation will have to deal with it.

Previous study by Loewenson (1999) showed the direct and indirect costs of occupational hazards. Some of the direct costs of occupational hazards for employers include the payment of salary, compensation, and repair or replacement of machine and equipment, while one of the most obvious indirect costs is the human suffering caused to workers' families.

### **CONCLUSION**

The present article examined the implications of occupational health and safety intelligence in Nigeria, with a focus on various dimensions of safety intelligence, such as safety knowledge,

problem solving and social competence. The article has revealed high level of awareness of the importance of occupational health and safety among managers and senior staff members of various organizations in Nigeria. However, the level of investment in occupational health and safety programmes was inadequate, as only a few organisations invested fairly in precautions.

Occupational health and safety risks are primarily due to several factors, such as negligence by the employers or employees, inadequate training on precautions and poor knowledge of occupational health and safety issues. These factors provide a basis for high rates of occupational health and safety risks in the Nigerian work environment.

The high rate of occupational health and safety risks shows the need for adequate investment in occupational health and safety intelligence programmes, with a focus on precautions. Organisations can be strengthened through renewal of interest in safety precautions and occupational medicine.

It is important to promote the development of occupational health services in the private and public sector of the Nigerian economy. Also, there is urgent need for the training of doctors to recognise work-related diseases in the early stages. A good policy on occupational health with adequate investment in precautions and safety intelligence will enhance individual and organizational development in Nigeria.

The Nigerian government and employers' organizations should comply fully with the ILO's Convention 155 on occupational health and safety. Health and safety programmes will have positive effects on workers and organisations. Adequate investment in safety programmes will save employers a great deal of money. Thus, managers of organisations should make occupational health and safety a priority. The vicious cycle of poor investment in occupational health and safety intelligence systems should be broken.

## REFERENCES

- Akinboro, A. A., Adejumo, O. P., Onibokun, C. A. & Olowokere, E. A. (2012). Community health care workers' risk perception of occupational exposure to HIV in Ibadan, south-west Nigeria. *African Journal of Primary Health Care & Family Medicine*, 4(1), 1-9.
- Allen, J. & Henry, N. (1997). Ulrich Beck's risk society at work: Labour and employment in the contract service industries. *Transactions of the Institute of British Geographers*, 22(2), 180-196.
- Amira, C. O. & Awobusuyi, J. O. (2014). Needle-stick injury among health care workers in hemodialysis units in Nigeria: A multi-centre study. *International Journal of Occupational & Environmental Medicine*, 5(1), 1-8.
- Atilola, O. (2012). Partaking in the global movement for occupational mental health: What challenges and ways forward for sub-Sahara Africa? *International Journal of Mental Health Systems*, 6(15), 1-10.

- Beck, U. (1992). *Risk society. Towards a new modernity. Trans. Mark Ritter*. London: SAGE Publications.
- Draper, E. (1993). Risk, society, and social theory. Risk society: Towards a new modernity by Ulrich Beck; Mark Ritter; Risk and blame: Essays in cultural theory by Mary Douglas. *Contemporary Sociology*, 22(5), 641-644.
- Ekinsmyth, C. (1999). Professional workers in a risk society. *Transactions of the Institute of British Geographers*, 24(3), 353-366.
- European Organisation for the Safety of Air Navigation (Eurocontrol). (2013). Safety intelligence for ATM CEOs: A white paper. Retrieved April 30, 2014, from [www.eurocontrol.int](http://www.eurocontrol.int)
- Fruhen, L. S., [Mearns, K. J.](#), Flin, R. & [Kirwan, B.](#) (2014). Safety intelligence: An exploration of senior managers' characteristics. *Applied Ergonomics*, 45(4), 967-975.
- Gioia, D. A. & Mehra, A. (1996). Sensemaking in organizations by Karl E. Weick. *The Academy of Management Review*, 21(4), 1226-1230.
- Gunningham, N. (1999). Integrating management systems and occupational health and safety regulation. *Journal of Law and Society*, 26(2), 192-214.
- Haight, J. M., Yorio, P., Rost, K. A. & Willmer, D. R. (2014). Safety management systems: Comparing content and impacts. *Professional Safety*, 5, 44-51.
- Harold, J. (2002). Making sense: A theory of interpretation by Paul Thom. *The Journal of Aesthetics and Art Criticism*, 60(1), 93-94.
- Hutter, B. M. (1993). Regulating employers and employees: Health and safety in the workplace. *Journal of Law and Society*, 20(4), 452-470.
- Idoro, G. I. (2011). Comparing occupational health and safety (OHS) management efforts and performance of Nigerian construction contractors. *Journal of Construction in Developing Countries*, 16(2), 151-173.
- Idubor, E. E. & Oisamoje, M. D. (2013). An exploration of health and safety management issues in Nigeria's effort to industrialize. *European Scientific Journal*, 9(12), 154-169.
- Krahmann, E. (2011). Beck and beyond: Selling security in the world risk society. *Review of International Studies*, 37(1), 349-372.
- Loewenson, R. (1999). Assessment of the health impact of occupational risk in Africa: Current situation and methodological issues. *Epidemiology*, 10(5), 623-639.
- Loewenson, R. (2001). Globalisation and occupational health: A perspective from southern Africa. *Bulletin of the World Health Organization*, 79, 863-868.
- Marchand, A., Simard, M., Carpentier-Roy, M., & Ouellet, F. (1998). From a unidimensional to a bidimensional concept and measurement of workers' safety behavior. *Scandinavian Journal of Work, Environment & Health*, 24(4), 293-299.
- Moraru, C. (2001). The global turn in critical theory. *Symplokē*, 9(1/2), 74-82.
- Naderpour, M., Lu, J. & Zhang, G. (2014). A situation risk awareness approach for process systems safety. *Safety Science*, 64, 173-189.
- O'Dunnell, O., Rosati, F. C., & Doorslaer, E. (2005). Health effects of child work: Evidence from rural Vietnam. *Journal of Population Economics*, 18(3), 437-467.
- O'Connell, D. (1998). Sensemaking in organizations by Karl E. Weick. *Administrative Science Quarterly*, 43(1), 205-208.

- Ogoina, D., Pondei, K., Adetunji, B., Chima, G., Isichei, C. & Gidado, S. (2014). Prevalence of hepatitis B vaccination among health care workers in Nigeria. *International Journal of Occupational & Environmental Medicine*, 5(1), 51-56.
- Ojedokun, O. & Idemudia, E. S. (2014). Burnout among paramilitary personnel in Nigeria: A perspective from conservation of resources theory. *South African Journal of Psychology*, 44(1), 106-117.
- Shrivastava, P. (1995). Ecocentric management for a risk society. *The Academy of Management Review*, 20(1), 118-137.
- Siegel, G. S. (1964). Neglect of occupational health in public health planning. *Public Health Reports*, 79(11), 963-966.
- Treiber, L. A. (2005). *Workplace organization, labor process control and occupational health*. Ph.D. Thesis, North Carolina State University.
- Westerholm, P. (1999). Challenges facing occupational health services in the 21st century. *Scandinavian Journal of Work, Environment & Health*, 25(6), 625-632.