UNIVERSITY OF CAPE COAST

# IMPACT OF COMPUTER USAGE ON SAFETY AND HEALTH OF ADMINISTRATORS AT THE UNIVERSITY OF CAPE COAST


SARAH ANNIM

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# IMPACT OF COMPUTER USAGE ON SAFETY AND HEALTH OF ADMINISTRATORS AT THE UNIVERSITY OF CAPE COAST

BY

SARAH ANNIM

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# DECLARATION

## Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

Candidate's Signature: ……... Date: …….

Name: Sarah Annim (Mrs.)

## Supervisor's declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature: ……. Date: …….

Name: Dr. Edward Wilson Ansah

## ABSTRACT

The purpose of the study was to examine the impact of computer usage on the health and safety of administrators at the University of Cape Coast (UCC). A descriptive cross-sectional survey design was used, and a questionnaire was administered both online and face-to-face to 281 administrators. Chi-square and logistic regression were used in addition to frequencies, percentages, mean, standard deviation, and other statistical methods to analyse the data that was gathered and processed in SPSS. The results showed that 94.66% of the administrators were aware of the health hazards associated with computer use. However, they did not have adequate knowledge about the standard operating procedures (SOPs) to follow which resulted in major computer-use-associated health challenges such as back pain, neck pain, and vision problems. The administrators' symptoms from these health challenges persisted for 1-2 years. Most of the administrators also agreed that the management of UCC provides screen protectors, appropriate workstations, and conducts training on computer usage. Socio-demographic factors like gender, educational level, designation, as well as years of work experience in using computers, have an influence on health and safety challenges of the administrators. It is recommended that management should educate and train administrators on computer-use SOPs and the health hazards associated with computers. They should also engage resource persons in occupational health and safety training.

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## KEY WORDS

Administrators

Computer Usage

Health and Safety Challenges

Health and Safety Practices

Occupational Health and Safety

Standard Operating Procedures

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## DEDICATION

To all administrators who have suffered health and safety challenges because of computer usage.

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| | |
|---|---|
| AA | Administrative Assistant |
| CAA | Chief Administrative Assistant |
| CANS | College of Agriculture and Natural Science |
| CENAD | Central Administration |
| CHLS | College of Humanities and Legal Studies |
| COES | College of Education Studies |
| COHAS | College of Health and Allied Science |
| CODE | College of Distance Education |
| CTS | Carpal Tunnel Syndrome |
| CVS | Computer Vision Syndrome |
| DICTS | Directorate of ICT Services |
| GAUA | Ghana Association of University Administrators |
| ICT | Information Communication Technology |
| JAA | Junior Administrative Assistant |
| OH | Occupational Health |
| OHS | Occupational Health and Safety |
| OLS | Ordinary Least Square |
| OSHA | Occupational Safety and Health Administration |
| PAA | Principal Administrative Assistant |
| PC | Personal Computers |
| PPE | Personal Protective Equipment |
| SAA | Senior Administrative Assistants |
| UCC | University of Cape Coast |
| VDT | Visual Display Terminal |

# CHAPTER ONE

# INTRODUCTION

## Background to the Study

Jobs have evolved over the years and currently the use of technology, with computer has become the primary tool for almost every workplace (Frey & Osborne, 2017). Moreover, illness and injuries are inherent part of every job (Zeb, Riaz, Tahir, Anwar, & Altaf, 2017). Globally, about 317 million work-related accidents occur each year leading to 2.78 million deaths (Sabz Tajari, Masoudi Asl, & Hessam, 2019). About 313 million of these accidents result in injuries whereas 160 million leads to diseases which could be avoided if safety measures are implemented (Sabz Tajari et al., 2019).

There have been developments in occupational health and safety (OHS) practices across the globe, but very little in Africa particularly Ghana. Matters concerning OHS in several African nations are very poor (Ross, Crisp, Månsson, & Hawkes, 2012), and such issues in Ghana has not been given much attention because the nation does not have an all-inclusive OHS policy (Mustapha, Aigbavboa & Thwala, 2017). Furthermore, inadequate and untrained OHS professionals, poor infrastructure and absence of good monitoring and surveillances for OHS related injuries and diseases were identified as some of Ghana's OHS challenges (Anku-Tsede, 2016).

Many tools are used to accomplish work task, and computers have become a vital tool used by administrators, which expose them to computer- related health problems such as Carpal Tunnel and Computer vision syndromes and ergonomics concerns (Johansson, 2015). It has been projected that almost 70 million people globally spend hours staring into computer screens (Ranasinghe et al., 2016). Studies in developed countries have clearly shown that, there is a relationship

between computer use and visual related complications (Akinbinu & Mashalla, 2014).

Globalisation has made it possible for formal employment to grow quickly particularly in the service sector, related to the generation of inflexible, insecure, and even hazardous employments (Bacchetta & Bustamant, 2009). Therefore, corporate entities are continually becoming overwhelmed by innovative trends accelerating global competition, product and technological changes, demographic, and deregulation changes by implementing programmes and policies in today's competitive settings to survive (Burton, Obel, & Håkonsson, 2015). The need for a safe and comfortable work environment has gained attention recently since labour experts contend that OHS regulations are necessary to maintain industrial productivity (Bentil, 2018).

Technological developments in communication and transportation, ever-changing job trends, changes in the organisation of work activities and disparities in job trends have also helped to organise company life cycles and led to the development of new technology to produce new forms and patterns of hazards, and risks in the workplace (Anderson, 2019). Similarly, population movements and demographic changes as well as the resulting pressures, particularly in the service sector, are likely to have a negative impact on occupational health and safety (Corin, 2016; De-Haas, Castles, & Miller, 2013).

Generally, the absence or inadequate training on OHS measures hinders its effectiveness in organisation where they are present. This could be a result of unawareness or noncompliance to the OHS measures put in place by the organisation. In fact, safety and health in the organisation must be every body's concern. However, in addition to being "inflexible, precarious, and insecure," many jobs in Ghana also present a high risk of injury due to the way they are performed and the conditions in which they are done (Bentil, 2018). Most of these

work environments put employees at risk for environmental hazards like traffic accidents, fire hazards, criminal activity, assault, discomfort from the weather, and injuries to muscles (Alfers, 2009; Tulchinsky &Varavikova, 2014). Despite the existence of numerous potential hazards, workers in Ghana remain not properly protected by the establishments that formally oversee OHS at the workplace (Alfers). Meanwhile, effective health and safety management systems have helped to reduce injuries in organisations in developed countries whereas increased rates of work-related injuries occur in less developed countries (Kim, Park, & Park, 2016). For example, an industrial worker in a developing country is eight times more likely to have a fatal experience than another worker in the same working environment in an advanced country. This is because differences in countries, economy and company size play a pivotal role in the level of protection that one receives against occupational hazards (Alli, 2008; De Stefano, 2016).

Technological advancement has brought about the move from paper to paperless in administrative functions in organisations particularly in higher education (Orantes-Jimenez, Zavala-Galindo, & Vazquez-Alvarez, 2015). According to Agbo (2015), ICT offers some facilities and possibilities for educational administrators to do their tasks. Communication and information systems have changed the very nature of higher education, allowing information to be generated, transferred, stored, retrieved, and processed by almost all who work, study or interact with a given institution. Storing information on computers makes it easy to work with, shared among administrators in the same organisation or transferred to other administrators in other organisations without personnel moving around (Agbo, 2015).

Advancement in the higher education sector has made the administration of higher education complex. Various researchers have disclosed that incorporating ICT helps to reduce complexity and enhances the general

administration of higher education (Krishnaveni & Meenakumari, 2010). Areas where computers are found to be useful in academic institutions include, the Human Resource Department, Finance Department (Accounting, pay roll), Internal Audit, Library and in offices where administrators use computers to perform general administrative functions (Krishnaveni & Meenakumari, 2010). Kunda and Chama (2016) opined that computers are also used by educational administrators for students' admission process and records keeping, produce examination results and transcripts, finance and human resources database, as well as management information systems.

Typically, educational administrators use computers for web-based admissions services, staff administration as well as routine activities of the organisation (Adam, Effah, & Boateng, 2017; Salerno, 2009). Staff administration comprises recruitment and work allocation to staff in all sectors of the establishment, performance appraisal, employee turnout and leave management, and other forms of communication to and from the organisation and among peers. Working with computers help employers and employees to process large volumes of data in a meticulous and quick way and in so doing reduce faults and make data recovery less difficult (Ajah & Chigozie-Okwum, 2019; Salerno, 2009). A study by Bosu (2008) on the utilization of computer technology in public universities in Ghana reported that even though computers were available, and administrators had access, Fifty-eight percent of the administrators disclosed low or moderate skills in the use of computers. However, they agreed that computers are essential and enhances the performance of their work (Bosu, 2019).

Fundamental changes occur in an organisation when its internal communication patterns are altered with new technologies. Jasanoff (2016) asserted that an appalling gap exists between the rate of technological improvement and the ability to design organisational interventions that help

people to effectively use new technology. If these changes result in a growing team of dissatisfied employees and unpredictably low productivity rates, then the fault may not lie in the technology, but the work design. Thus, most workers who use computers tend to be satisfied with the systems and software but are displeased with the office environment and the lack of regular user training (Fuglseth & Sørebø, 2014). A situation that can create challenges like injuries for the employees.

Occupational injuries are a significant issue in settings where computers are frequently used (Korhan & Mackieh, 2010). Administrators are also exposed to radiations from computers and are susceptible to musculoskeletal disorders if computers are not rightly positioned, workstations are not in good conditions or not fit for the purpose. Prolonged, intense, and repetitive computer use can lead to lost productivity (direct cost) and expensive health issues (direct cost) (Korhan & Mackieh). However, the impact of musculoskeletal pain and the frequency linked to computer use have not gotten much attention (Korhan & Mackieh). Global estimates indicated that approximately 22,000 users of computers are affected with musculoskeletal discomfort including wrist pains at work every year (Dominguez, Guadian, Lona & Mare, 2023).

Various workers have different levels of challenges associated with their jobs. For example, Le Fevre, Boxall and Macky (2015) identified that administrators and managers are noticeably more stressed and more likely to experience work-life imbalance. This is because apart from being exhausted from working in the office, such workers sometimes send work home to avoid spill overs in the subsequent days. Therefore, to safeguard and advance the health and safety of these worker groups, it is imperative that practical safety measures be institutionalized. In contrast to Mariscal, López-Perea, López-García, Herrera & Garcia-Herrero (2019), Hargreaves et al. (2019) observed that though the need to

protect workers from occupational health hazards and promote safety for all have been emphasised in many international documents, workers health and safety remain neglected in most developing countries under the pressure of overwhelming social, economic, and political challenges.

Though Ghana does not have a comprehensive national OHS policy (Annan & Addai, 2015; WHO, 2019), some fragmented acts such as the Ghana Labour Act 2003 (Act 651) require employers to ensure that their employees are not exposed to conditions that would lead them to work-related injuries or illnesses (Bentil, 2018). Employees are also required to exhibit their duty with care in ensuring that they work by the standard operating procedures for their health and safety and that of others.

**Statement of the Problem**

There have been uncertainties about potential health problems that computer users may face, which consequently made producers release articles to counter its effects on computer market growth (Maitland & Sammartino, 2015). However, a few studies (Akinbinu & Mashalla, 2014; Brizga, Peks, & Bertaitis, 2013; Ellahi, Khalil, & Akram, 2011; Sirajudeen, Muthusamy, Alqahtani, Waly, & Jilani, 2018; Tint, Tuulik, Karai, & Meigas, 2014; Vimalanathan & Babu, 2017) revelled the health impacts of computer to users. Iyadurai, Blackwell, Geddes and Holmes (2018) noted that in developed countries, though efforts have been made to determine the nature and extent of health hazards caused by prolong exposure to computers, the same cannot be said about developing economies.

The University of Cape Coast (UCC) has about 828 administrators who perform operational level activities (UCC, 2020). Without these administrators, management cannot function properly with over 70,000 students to serve, from Ghana and beyond. This research is being carried out at UCC because university administrators use computers for work-related purposes and may work overtime

to provide the necessary services that management needs to function. As a result, they may be susceptible to computer-related risks as well as health and safety concerns (Korhan & Mackieh, 2010). Le Fevre, Boxall and Macky (2015) observed that such administrative jobs result in burnouts, stress, frustrations and so on. Gyeltshen and Beri (2018) also stated that the operational level activities put a lot of pressure on the administrators to meet set targets which potentially affects turnover rates. However, no study has been done to determine the health impact of computer usage on administrators of UCC and the extent to which safety measures have been put in place to specifically enable the administrators to perform their functions.

**Purpose of the Study**

The purpose of the study was to investigate the influence of computers usage and associated factors on health and safety of administrators in UCC and explores the influence of socio-demographic factors in the occurrence of health and safety issues among the employees.

**Research Questions**

The following research questions guided the study:

1. What is the level of awareness and knowledge of administrators in UCC on health hazards associated with the use of computers?
2. What are the Computer Use Health Challenges of Administrators in UCC?
3. What are the computer-use health and safety measures provided for administrators by the authorities in UCC?
4. What is the relationship between the level of knowledge on computer-use hazards and the occupational health and safety practices among administrators in UCC?
5. What is the extent to which socio-demographic variables of administrators in UCC influence their computer-use health and safety challenges?

**Significance of the Study**

Generally, the results of this study enable the researcher to ascertain the extent to which safety and health programmes are practiced. Findings will draw the attention of the university authorities to the computer use health and safety concerns of administrators. The study may help the administrators to apply the appropriate safety and health measures put in place by the university.

The results could contribute to the body of knowledge already available on administrators' computer use, health, and safety practices. They could also serve as the foundation for further research on the topic, both at the university and nationwide. In the nutshell, the study will enhance the understanding and how to achieve change in OHS practices among administrators with regards to reducing the risk of injuries or health disorders with the use of computers at UCC.

**Delimitation**

The study was delimited to assessing the level of awareness and knowledge of health and safety practices, computer hazards associated with computer usage, health and safety challenges and related safety measures. The main instrument for the data collection was a questionnaire and data collected was analysed using chi-square technique.

**Limitations**

Owing to the onset of COVID-19, the researcher had to conduct an online survey. However, the response rate was very poor which delayed the data collection process. Therefore, the researcher had to complement with a face-to-face method of administration and employ research assistants as well as observe all COVID-19 protocols. Due to the work pressures of the administrators, it was difficult to meet respondents to administer and retrieve the instrument.

**Organisation of the Study**

The study is organised in five chapters. Chapter one comprises the background to the study, the statement of the problem, purpose of the study, research questions, significance of the study, delimitation and limitations. Chapter two deals with review of theories, conceptual framework and empirical literature related to the study. In chapter three, the study's methodology is described. It includes the population, research design, study area, sampling strategy, data collection instrument, validity and reliability of the instrument, and data collection and analysis. The results and discussion are the main topics of chapter four. The summary, findings, conclusions, and recommendations are covered in chapter five.

# CHAPTER TWO

# LITERATURE REVIEW

The purpose of the study was to examine the effects of the use of computers and associated factors on health and safety of administrators in UCC and explore the influence of socio-demographic factors in the occurrence of challenges related to health and safety among the workers. This chapter provides a thorough analysis of pertinent literature on topics like computer usage and its effects on health as well as health and safety procedures. The review process is divided into four subsections of occupational health and safety, theoretical and empirical reviews, and the conceptual framework.

## Concepts of Occupational Health and Safety

Occupational health is the study and practice of predicting, identifying, assessing, and managing pressures that occur in or from the workplace environment, which can cause illness, loss of health and well-being or serious distress among employees or community people (Ivanceivich, 2014). Occupational safety, on the other hand, includes physical inspection and assessment of workplace conditions and equipment as well as work procedures to assess the vulnerability and risk of injuries, and the application of corrective actions to address the issue, including regular monitoring, personnel training and retraining, job redesign to remove unsafe conditions (Milkovich & Boudreau, 2011). International organisations like the WHO (2015) and ILO (2011), as well as national bodies and authorities, have provided numerous definitions of occupational health, and safety (Alsamawi, Murray, Lenzen, & Reyes, 2017; Zou, 2016).

When these concepts are summarised, occupational health is considered a multidisciplinary operation directed at the protection and promotion of other employees health, the prevention and control of occupational diseases and

injuries, and the reduction of occupational causes, and conditions that are harmful to workplace health and safety, the production and fostering a healthy and secure work atmosphere, enhancing employees' physical, social, and mental well-being, supporting their growth and maintenance of their capacity for work, as well as their professional and social advancement during their working lives, and making a positive contribution to a sustainable future at work by giving employees the chance to lead socially and economically productive lives (WHO, 2011).

Danger detection, risk assessment, and incident control are the primary health and safety concerns. Safety hazards are aspects of the workplace that have the potential to cause fatalities or seriously injure an employee right away (Alsamawi et al., 2017). Conversely, health hazards are aspects of the workplace that gradually and cumulatively lead to employees' health deteriorating. A persistent or potentially fatal illness may cause the person to experience or become permanently disabled. According to Pratt and Bennett (2009), management needs to give health and safety issues more attention because they are now a reality that cannot be ignored. Employers are under growing pressure from governments, labour unions, insurance providers, and the public to provide a safe and healthy work environment (Kasperson, 2019). However, to create a comprehensive policy, all relevant parties would need to be involved (Omari, Frempong, & Arthur, 2018).

Ivanceivich (2015) uses the diagnostic approach to health and safety to highlight the importance of the job, employees' attitudes toward health and safety, economic conditions, the role of unions, management priorities, and the government as important environmental factors that affect the creation of a working environment healthy and safe for workers. The developed world has safer and more robust workplaces; the main causes of this discrepancy are improved health and safety systems, improved emergency services and medical

facilities in industrialised nations, and worker participation in health and safety decision-making (Yanar, Amick, & Eerd, 2019). The mining, agricultural, forestry, and logging construction industries are among those with the highest risk of accidents globally (ILO, 2010).

Echoing these assertions, Adeniyi, Sofola and Asiyanbi (2018) noted that most of employees in the third-world countries lack access to healthcare. Adeniyi et al. further argued that with regards to Africa, such group of workers can be found in all career fields across the continent. Further, Watkins, Goudge, Gómez-Olivé and Griffiths (2018) noted that primary sources of health causing agents are predominantly pesticide contamination, mineral and agricultural pollution, heavy lifting, heat exhaustion, workplace mishaps, physical, chemical and manufacturing risks, and ergonomic issues. If an organisation's operations are not well coordinated, there is the risk of encouraging organisational accidents. Ivanceivich (2015) argues further that the low priority given to health and safety by most African organisations is partly responsible for the apparent ignorance in accident reporting. This may be the result of officials' willingness to overlook unsafe or sub-standard health and safety conditions in the name of politics or business.

**Theoretical Review**

This section discusses theories that underpin the concept of computer usage as well as health implications within the job environment. In this study, the theories of accident causation were applied. These are a composite of related theories that explain the cause and effect of accidents in the work environment, strategies to prevent them as well as define the responsibilities of human resource managements in curbing accidents. In addition, the principles of job safety were used auxiliary explanations to the concept of safety. The principles offer some theoretical conditions for a safe work environment as well as outlining

explanations to the cause of certain incidents when employee are discharging their duties.

**Theories of Accident Causation**

These theories consist of Henrich's Domino Theory (1950), Ferrell's Human Factor Model (1989), Peterson's accident/incident model (1980), multiple causation theory (Kaye, 1982), The Swiss Cheese' Model (1990) as well as Health and Safety and Wellbeing (HSW) from the Perspective of Machine Maintenance (Lee, 1995). The common denominator for all these theories is the concept of accident. According to the authors of the various theories, an accident is an unplanned, uncontrollable, and unexpected event that results in property damage, no property damage, or no injury to humans. This implies that while illnesses or even near-misses may arise from such incidents, violence is not always the outcome. The theories posit that incidents have equal importance of accidents and refer to the international Labour Organisation's doctrine that when an injured person returns to work immediately or within 48 hours it is a non-reportable accident (Kagan, Byrne, & Leighton, 2017).

Fatal means an accident leading to death within a period of one year from the day of occupational accident, whereas non-fatal accidents are those accidents which prevent workers from work for 48 hours or more. The theories list the lack of knowledge, skills, commitment, interest, efficient regulatory framework, and unsafe work conditions are various causes responsible for accidents or unplanned. The theories asset, that safety is the first and foremost concern and foundation of all activities (Thomas & Turnbull, 2018). Safety and man- hour reduction are not contradictory but, the approaches of the two are identical. However, wastes, uneven, and unreasonable movement result into injury to the worker. The theories of accidents are based on four basic axioms - all accidents are incidents, all

incidents are not accidents, all injuries result from accidents, and all accidents do not result into injury.

The causality between the doctrine of these theories and health effects of using computers as a tool, to facilitate work, rest on the notion of injury and accidents. The prolong usage of computers results in many injuries to the user (Vos, Nieuwenhuijsen, & Sluiter, 2018). Other literature (Kuckelman et al., 2018) also confirms the adverse health effects of radiation as well as explosion (Parihar et al., 2016) and visual effects causing harms to the human body (Maples-Keller, Bunnell, & Rothbaum, 2017).

**Heinrich's Domino Theory**

According to Heinrich's theory, accidents can have cascading effects. Heinrich uses the metaphor of dominoes collapsing on top of one another to explain this. The theory is particularly notable (Adhikary, Keen, & Teijlingen, 2019) as one of the first scientific theories used to explain workplace accidents even in modern times, even though it lacks the advancement and complexity of other theories. The theory states that when one domino falls, the others tip over enough to knock it and so on, until all the linked dominos are down. But if you take out even one domino, the whole thing falls apart. Juxtaposing this concept to health effect of computer usage, Petitta, Probst, Ghezzi and Barbaranelli (2019) posit that when computers are used for a long time or without safety measures, it results in a series of problems such as backaches, vision problems, headaches, and fatigue. However, if proper protective measures (i.e. vision protection) are taken such as eliminating vision problems, headaches, the chair on which the employee sits to use the computer is good enough to cater for spine protection, then the chance that the user will suffer backaches, spinal injuries, waist pain and so on is less.

Heinrich identified five stages of accident causation (Social Environment and Ancestry, Fault of Person, Unsafe Act or Mechanical or Physical Hazard (unsafe condition), Accident, and Injury). The first stage, the social environment and ancestry, encompasses anything that may lead to producing undesirable traits in people. This is evident in computer usage as health issues such as headaches, spinal pain, and wait pain differ from one person to another. There is literature to affirm that such health issues are influenced by environment and hereditary (Whitehead, Cambridge, & Renton, 2018). The theory's detractors contended that Heinrich's inclusion of ancestry and genetics is largely a reflection of the era in which it was written. Also, contemporary advocates of the theory prefer to use the term inherited behaviour rather than genetics or ancestry and justify it with the fact (Fernandes, Rashmi, Benny, & Sagna, 2019) that temperaments and alcoholism could be hereditary. This first stage is further supported by social learning theories (Pritchard, 2017) and in the criminological theories (Akers & Jensen, 2017).

The second stage of the accident causation refers to personal characteristics that are conducive to accidents. It is clarified that being angry can result in impulsive outbursts and a disregard for others' safety. Likewise, a general lack of caution may also be a sign of bad character. This stage also includes ignorance, which includes things like not understanding safety rules or standard operating procedures. Jones-Berry (2018) observed that though most employers provide some safety measures for employees for their work, the inconvenience associated with obeying and using some safety measures makes some employees ignore these safety measures and use the computers directly. Similarly, Meyers, Al-Tarawneh, Bushnell and Morrison (2019) noted that some employees are not even aware that some of their health challenges are because of the continuous reliance on computers for their daily work. Kasap and Acar (2018) on the other

hand noted that in some instances, both employer and employees either do not know or do not appreciate certain safety measures required for computer usage.

In the third stage, the theory asserts that an identifiable start to a particular incident is frequently an unsafe act or condition. Heinrich clarified that this stage is closer to the accident in terms of temporal proximity than the previous two, which have an impact on the likelihood of accidents occurring. This includes engaging in risky behaviour, like turning on a machine without giving enough notice, or neglecting to take the necessary precautions, like utilizing guardrails or other safety measures. This stage basically involves actions or inactions that occasionally result in accidents. Dessie, Adane and Chercos (2018) noted that in most offices, the electrical wiring is not done properly thus inhibiting proper flow of electricity of the computers. They further noted that it is not uncommon to find electrical wires crisscrossing the flow and easily tangling the feet of bypasses. Similarly, Attia, Fouad and Radwan (2019) noted most offices do not have air conditioners to regulate the temperature of the environment where computers are being used. All these create the right conditions for hazards, accidents, and injury to occur when using computers.

Heinrich clarified in the fourth stage that injuries sustained in an accident are frequently the result of chance rather than design. According to the theory, this highlights the associations between stages in terms of causality. Heinrich clarified, nevertheless, that while an accident is a necessary cause of an injury, it is not a sufficient one. Critics of the theory (Ahmed & Alwan, 2018; Woodford, 2018) pointed out that while the undesirable traits in stage two are not invariably associated with impoverished environments, they could not arise in the absence of such environments.

Nonetheless, Heinrich stated that the most significant policy implication, given this required causality, is to take out at least one of the dominoes, which can

then result in a positive subculture through accident prevention seminars and training (Toft, Dell, Klochner, & Hutton, 2012). Heinrich concludes that even while an organisation might not be able to eliminate every individual with undesirable traits, it can have a procedure in place for handling mishaps to reduce casualties and damage (Toft et al., 2012). Heinrich highlighted the third domino of unsafe acts or conditions as key domino as unsafe acts are 88% responsible for accidents/injuries, therefore, practices such as training, rules, and regulation, awareness, rewards, employee participation, programs, and inspections play key role. The technological solutions to improve working conditions contribute only 10% (Avwata, Oyegun, & Ugbebor, 2021; Toft et al.). Heinrich propounded accident proportion as, out of 330 accidents due to unsafe actions and conditions, 300 are no injury accidents, 29 are minor injury accidents and one is lost time accident (See Figure 1).

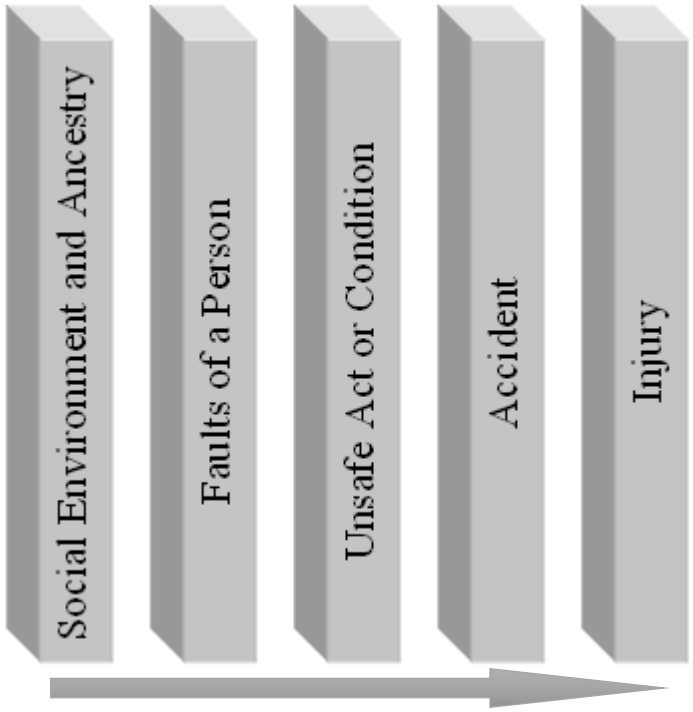


Figure 1: Heinrich's Domino Theory (Toft et al., 2012)

**Ferrell's Human Factor Model**

In contrast to Heinrich's perception of accidents as a single chain reaction, Ferrell's model incorporates multiple causes and is very specific about these causes (Owen & Harrison, 2019). Ferrell defines accidents as being the result of an error by an individual and explains his theory using the assumption that accidents are caused by one person (Owen & Harrison). Ferrell identified overload, incompatibility, and improper activities as the three general causes of accidents. Each of these causes are broad categories that contain several more specific causes. The model claims that improper activities are the simplest of the concepts and encompasses two straightforward sources of accidents. Firstly, irrespective of how responsible a person is, it is difficult for them to have prior knowledge of an impending accident. Subsequently, there are people who knowingly choose to take that risk despite knowing the consequences of their actions (Owen & Harrison).

This notion is very common in the workplace environment where computers are the main tool for daily administrative and operational tasks. What makes the situation more dangerous is that the computers operate without air conditioners, without a screen protector or the right chair. Horseman (2018) noted that most management chose to turn blind eye while some employees chose not to complain because of fear of managements' adverse reaction. The most complex of Ferrell's causes is the overload. This falls into three smaller categories according to Ferrell. Initially, part of an overload can be attributed to an individual's emotional state. To start with, these include states like being restless and unmotivated. A person's physical and educational background are also considered aspects of their capacity. Physical fitness, according to Ferrell, is a result of both genetic makeup and training.

Also, situational factors, such as exposure to drugs and pollutants as well as job related stressors and pressures also affect one's capacity. This eventually leads to an overload because of the task's difficulty, the environment's positive or negative effects (like noise and other distractions), and even the task's level of danger. Ferrell went on to say that apart from one another, human error can result in an accident due to overload, incompatibility, and inappropriate activities (Owen & Harrison, 2019).

**Petersen's Accident/Incident Model**

Heinrich, Petersen and Roos (1980) opined that Ferrell's Human Factor Model (1989) is essentially expanded upon in Petersen's model. with much emphasis on overload. On the other hand, Anya, Nguyen, Groth and White (2018) claimed that although there are some modifications and refinements, the idea of an overload brought on by state, capacity, or load is substantially similar to Ferrell's work. Using workstation design, controls, and displays as an example, Petersen conceptualized the environmental aspect of incompatibility as a separate component of the model, which he named ergonomic traps. Furthermore, Petersen distinguished between the overload cause and the choice to err. Petersen also provided distinct justifications for choosing to make mistakes. These include an unconscious desire to err due to psychological flaws and the perception of a low chance of an accident happening, as well as a rational decision based on the circumstances, mainly the financial cost and deadlines.

The final explanation according to Petersen, is that the perception of low accident probability can include both actual instances of an accident being extremely unlikely as well as the natural inclination of a human to disregard his or her own mortality. This aspect of Petersen's model is akin to criminology's rational choice perspective as it makes the same assumptions of human rationality and hedonistic calculus (Walters & Morgan, 2019). Petersen added that although

human error plays a role in system failures, it is possible that an organisation's inability to rectify mistakes is the root cause of the problem. Inadvertent mistakes and accidents may be mitigated by this. According to Petersen, there are many ways for a system to fail, and one of the ways is when management fails to recognize errors and when employees lack the necessary training. An accident that results from a human error can still happen even in cases where inadequate policies are in place (Boettke & Candela, 2017).

**Systems Models Theory**

Systems model theory offers an alternative perspective on the interaction between people and their environments compared to the previously mentioned theories, which emphasize mistakes made by people and defects in the environment. A system model perceives a harmony between man, machine, and environment rather than seeing the world as full of hazards and people as prone to mistakes (Arghish, Tavakkoli-Moghaddam, & Rezaeian, 2018). According to the system model, the likelihood of an accident occurring is extremely low in normal circumstances. Therefore, the likelihood of an accident happening rises significantly if someone or something disturbs this harmony by altering any one of the three components or the relationships between them (Chen, Chen, & Wen, 2017).

In relation to this research, it suffices to assume that there must be a relationship between employee, computer, and the work environment. Therefore, when there is a disruption by one component, it impedes the optimal performance of the remaining two components leading to accidents. This further support the notions that employers must provide a favourable environment and quality computers to enable employees to work safely. Furthermore, it is important for employees to be well trained and all necessary safety measures put in place to prevent accidents. Another aspect of the systems model is the concept of risk-

taking. Firenze (1978) argues that there is risk associated with everything a person does in the model.

According to the system model, risks and smaller tasks are frequently assessed subconsciously. As a result, when someone decides to drive to work every morning, they consider the advantages (earning a living) against the risks (small possibility of getting into an automobile accident), and they determine that the advantages outweigh the risks (Firenze, 1978). This idea fits into Petersen's model and is comparable to the rational choice viewpoint. This means that managers, safety experts, and supervisors consider the possibility of injury or financial loss, just as potential criminals might consider the risks of getting caught. Therefore, the choice to proceed with the task is made only after it is determined that the possible gains surpass the possible drawbacks.

Firenze (1978) advocates of the system model theory suggest that the job requirements, the worker's abilities and limitations in relation to the job, the potential gain upon success, the potential consequences upon failure, and the potential loss of not attempting the task are the five calculated risks and benefits that need to be taken into consideration. The model states that following an initial attempt, feedback becomes available regarding these five factors. Put differently, a familiar task that has been completed before has known risks and rewards, whereas a new task frequently has greater unknown risk.

**Reason's Swiss Cheese Model**

Reason's model is not just a part of system theory it is the most widely adopted form of system theory on accident causation. Originally proposed in 1990, the theory argued that there is a chance for failure at every stage of a procedure. (Reason, 2003). Alternatively referred to as the Defense in Depth Accident theory, it sees risk as a trajectory that goes through corresponding gaps in defenses, barriers, and safety measures. If it can accomplish what Reason

referred to as "a direct flow through," a failure will ensue (Reason, 1990). Failures according to the theory means notifiable injuries, loss in productivity due to ill health or post-employment claims (Guldenmund, 2010). According to the theory, no system is perfect so by simply lining up what Reason calls ‘layers of defence’ comprehensively, companies can delay, retard or even prevent risk early enough before it fails.

Human risk factors typically exhibit a similar pattern, with latent issues and active deficiencies coexisting in the workforce. When these factors combine, they frequently result in subpar productivity and health outcomes (Guldenmund, 2010). To enhance the capacity to handle health risks, four crucial layers of health defense must be addressed to implement the theory of Defense in Depth in an administrative context. Reason illustrates each line of defense with a slice of Swiss cheese; the holes in the cheese signify potential issues or breakdowns in that defense. Failures can be classified as either latent or active (Shabani, Jerie, & Shabani, 2024). Reason defined latent failures as conditions that may remain dormant for a while before they result in an accident, and active failures as risky behaviours that directly cause an accident. Also, latent failure results from the absence of a policy outlining the safe completion of a specific work task (Shabani, Jerie, & Shabani, 2024).

As seen in figure 2, when all these cheeses are arranged and the holes line up, an accident can easily happen because none of the defenses detected the problem. However, if the holes are not aligned, the issue will be detected, and an accident will not ensue. According to Reason, each hole is a policy that addresses work that need to be completed. The next layer could be the Personal Protective Equipment (PPE) required to be worn to complete the task (Guldenmund, 2010). This means that a problem only occurs if policy fails to address the protective equipment required for the completion of task. Also, choosing not to use or using

the wrong protective equipment permits travel through the subsequent hole as specified in the policy.

Therefore, irrespective of the additional defenses that are made available, these two factors will make it possible for an accident to occur. Similarly, if there are no additional layers, the two conditions will still allow an accident to occur (Guldenmund, 2010). Despite successive layers of defense, small holes in each layer allows for some possibility that the defense will be ineffective. If the circumstances are right, these holes can align and allow an accident to occur. In relation to the use of computers, as a tool for administrative work, it is part of an institution that makes it operate as a unit as described by system theory. Therefore, if health and safety provision are not provided to assist in the use of computers, there is a misalignment in operation cycle of an institution. This increases the risk of health and other issues that causes disruptions in efficiency and work productivity (Guldenmund).

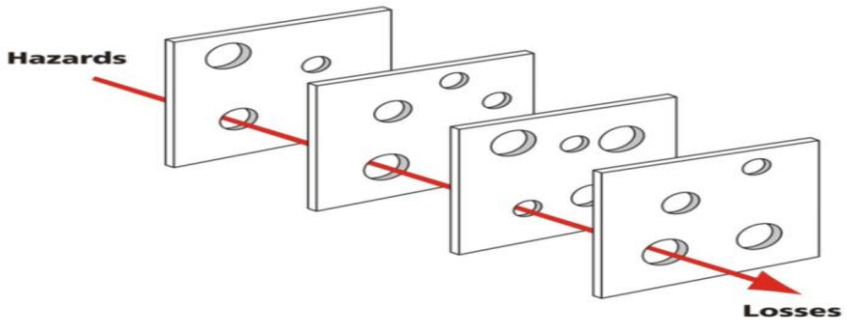


Figure 2: Reason's Swiss Cheese Model (David Mack, Wikimedia & Commons, 2003).

**Integration of Theories and General Safety Programme**

It is crucial to realize that no theory of accident causation fully explains why an accident occurs; rather, it only explains a portion of the cause. The cumulative effect of these theories presents a comprehensive view of accident. Also, (Baldwin, 2017; Mitchell, Myles, & Marsden, 2019) it is evident that no theory is comprehensive from the quantity of published works that refute it. This

means that for true accident prevention, the reduction of the probability of accidents can occur when all possible causes are addressed. Furthermore, the use of the term accidents in the theory refers to act or incidents that results in harm to the human body and threatens the health of the person working.

Even though the theories discussed have many program implications, those with associated responsibilities in the workplace need to seek additional information regarding accident causation (Fong et al., 2017). A good tactic is to carefully and consistently train employees, as the theories and models concur that human error continues to be a potential contributing factor to accidents. According to Sibanyoni, Tshabalala and Tabit (2017), the likelihood of an accident can be reduced by providing improved safety training, raising knowledge, and raising awareness of potential hazards. On the other hand, data point to the necessity of ongoing safety initiatives and training, suggesting that interaction with others and subcultures are common themes in the causes of accidents (Li, Chau, Lu, Shoaib, & Meng, 2019).

A toxic worker may influence potential staff members and cause the threat to escalate substantially, according to Ghasemi, Kalatpour, Moghimbeigi and Mohammadfam (2017). They also increase the likelihood of an accident occurring. Additionally, a safety awareness program is a good example of how to approach workplace issues, according to Ghasemi et al. (2017). This covers strategies like frequent gatherings and encouraging safety posters to raise awareness. Similarly, a highly effective safety program should inspire staff members to stay safe, according to Maslow's (1943) theory of motivation. Similarly, the Motivator-Hygiene theory, a two-factor theory of motivation developed by Herzberg, Mausner and Snyderman in 1959, contends that to avoid discontent, employees must be exposed to both hygiene factors, or regular aspects of their jobs like an enjoyable workplace, and incentives.

Herzberg et al. (1959) further recommends that management needs to understand the importance of maintaining a positive subculture and be trained with intervention strategies for problem employees. This is consistent with the theory of accident causation, which views the external environment as a crucial component of causality for accidents that needs to be taken care of. Guard rails, safety alerts, and hardhats are examples of issues that need to be taken seriously. Furthermore, it is important to consider the complex interactions that exist between humans and their surroundings. Ergonomic designs, which are frequently employed to boost output, can also improve worker comfort (Halkos & Bousinakis, 2010).

Evidence from Gaba (2018), and Simpson and Horberry (2018) affirms that reducing agitators by using ergonomic designs is beneficial because human error can be caused by boredom and anxiety. Safety, like any security challenge, is frequently responsive in nature, so it is not ideal to rely solely on conventional thinking, according to research findings by Forsberg (2019). Because of this, a safety program can benefit greatly from being proactive and applying unconventional thinking. Cloud (2018) noted that a relatively new strategy that, at the very least, garners attention is providing rewards and incentives to safety-oriented workers.

**Emerging Trends**

As accidents can never be totally avoided, Morgenthau (2018) suggested that being ready for the unavoidable should be a secondary objective of any effective safety program in addition to complying with regulatory requirements and preventing accidents. Accident prevention is still a crucial subject even with the literature on workplace accidents receiving little attention (Miller, Rogers, Park, Owen, & Meiser, 2017). According to Fiems and Hertig (2001), the Occupational Safety and Health Administration (OSHA) is fining more people for

unsafe working conditions than in the past and is doing so more frequently. Furthermore, a growing number of establishments are enacting safety regulations, and businesses are emphasising the importance of offering both security and safety.

Grant, Salmon, Stevens, Goode and Read (2018) observed that there has been a notable advancement in our understanding of causality of accidents and avoidance due to Heinrich's 1936 introduction of the Domino theory. The theory that was once the sole explanation for accidents has now given rise to numerous theories, viewpoints, and implications within the field. According to Grant et al., there is a significant influence on safety in the contemporary world from this rise in knowledge among both safety experts and individuals alike. Hulme, Stanton, Walker, and Salmon (2019) claim that accident causation theory and accident prevention are more advanced than ever, along with technological advancements in communication and safety. The US Bureau of Labor Statistics (2013), which reported a 32% drop in non-fatal illness and injury rates over the previous ten years, gives credence to this assertion. Hence, the comprehension and measurement of causality will lead to a more scientific methodology and more economical intervention tactics.

**Theory of Job Safety (TJS)**

The fundamentals of both general accident prevention and workplace safety are covered in this theory. Nevertheless, illnesses related to one's job are not covered by it; although they are related, they differ greatly. The relationship between workers, the environment, materials, machinery, and equipment, as well as financial factors like productivity, is what the theory refers to as "job safety" (ILO, 2011). Healthy, non-harmful, and manageably challenging work is the ideal. As a result, Bacow (1982) noted that specifications for job safety need to be confirmed prior to work starting and adhered to throughout the duration of the

work cycle. This guarantees that, among other things, the outcomes can be evaluated for feedback. Additionally, the theory maintained that planning should consider the supervisor's obligation to maintain the health and safety of those working in operational processes.

People and things interact in a typical functional institution, which is commonly referred to as a people-(machine)-environment system. This covers everything in the immediate vicinity, including the floors, stairs, electrical current, gas, dust, atmosphere, and so forth, in addition to the technical tools, machines, and materials used in the work (Admin, 2021; ILO, 2011). In terms of the relationship between the worker and the job, TJS outlines three potential relationships that show how the combination of people and the objective working environment for the sake of production can have unintended consequences that lead to personal injury incidents (particularly accidents) and hazardous working conditions.

The first relationship is "the worker and the objective working environment have an optimal relationship" (ILO, 2011). This indicates that the effectiveness of systems, like machines, is reliable, resulting in labour-saving techniques for workers that enhance their well-being and job safety. Additionally, the absence of potential mishaps or incidents, like near misses and defects, improves worker productivity (ILO, 2011). The worker and objective working environment are incompatible" describes the second relationship. It may be caused by things like underqualified workers, faulty supplies and machinery, and unforeseen procedures. Machines and other objective components of the system could break down at any time. There is a risk of near misses and small incidents due to the hazardous conditions that are created, which slow down production processes and reduce output (ILO, 2011).

Thirdly, there is a total collapse in the relationship that exists between an objective working environment and the worker, which results in damage, injury to

oneself, or both, reducing output. The subject of safety at work is discussed in this regard in relation to eliminating accidents (ILO, 2011).

**The Actively Caring Model**

Geller (2009) coined the term ' actively caring ' from a brainstorming session with security leaders at Exxon Chemical Company to refer to a goal in occupational safety, and that, employees care enough about the safety of their co-workers to act accordingly. In other words, workers who are actively involved in safety should constantly look for environmental hazards and unsafe work practices and enforce effective corrective measures if unsafe environments or activities are observed. Proponents (Geller, 1991; Guldenmund, 2010) of this theory holds the view that three factors increased an employee's tendency to "Actively Care" (AC) for a co-worker's protection or health. Individuals most suspected of AC are those high in self-esteem, (feel valuable), motivation (feeling able to make a difference), and group association or cohesiveness (e.g. feeling close to members of their working group).

In the relevance of these selected theories, it would be said that the risk theory/defence in-depth theory helped the researcher to identify how the company understudy builds security mechanisms to guard against identifiable injuries, loss of productivity due to claims relating to ill health or post-employment of its workers (Guldenmund, 2010). The actively caring model helped to establish whether staff of the University of Cape Coast care for each other at work and hence their pursuit for each other’s safety. Moreover, it will aid in the investigation of whether administrators possess such personal values as self-esteem, optimism, and group belongingness or cohesiveness.

**Problems Associated with Health and Safety Management**

Kheni, Gibb and Dainty (2010) identified problems associated with administration workplace safety and health management to include unavailability

of health and safety legislation and regulations, poor record keeping and reporting system for accidents, disorganised workforce, low priority given to issues regarding safety and the smaller size of the offices. O'Connor et al. (2005) postulated that the low level of English Language communication skills among some administrative workers inhibits health and safety programs. Bust (2008) instigated that there is a major challenge of altering the health and safety schemes to accommodate a cultural or multi-nationwide workforce. This will require the use of expensive initiatives such as, the use of interpreters, translation materials and an augmented use of pictorial methods for collaborating health and safety communications.

Teo and Ling (2009), identified factors that influence safety performance negatively and increase the likelihood of accidents as including derisory company policy, poor safety practices, unsafe attitudes of workers, poor commitment of management, inadequate knowledge on health and safety and inappropriate training of administration workers. Tam, Ravi, Dai and Tan (2004) revealed that health and safety management issues include: insufficient procurement of protective equipment, frequent safety meetings, ineffective or inadequate health and safety training, low knowledge of health and safety management, reluctance on the part of stakeholders to invest in safety services and lax administration.

**Measures to Promote Occupational Health and Safety**

A safety performance measure is only sufficient if it prevents accidents at the administration site from occurring (Raymond & Hinze, 2017). To ensure safety efficiency at various offices, an appropriate management should be hired. It is shown that the management of occupational health and safety is important in recognising significant work-related hazards (Fang et al., 2004). Several studies have advocated a behaviour-based approach for health and safety management

and have been reported to successfully improve safety efficiency in urban settings (Lingard & Rowlinson, 2010).

O'Toole (2009) proposed that a fair compromise should be reached on the role of designers, contractors, engineers, consultants and subcontractors in maintaining security at the administration site. Proper assignments of responsibilities will depend on the willingness of each staff to enhance measures of security control. Raymond and Hinze (2017) suggested that a report on employee awareness and safety management should be undertaken. It takes innovative methodologies to promote health and safety at work. They added that innovative solutions will be particularly appropriate for staff that frequently change their jobs and thus have insufficient access to health and safety promotion initiatives.

**Measures that Enhance the Application of Health and Safety Policies**

Cascio (2011) opined that management should devise a working health strategy and ensure that it is enforced successfully at work. He added that a health and safety plan should be implemented to improve the effectiveness of the strategy, which includes four aspects such as: an efficient safety record system, a clear budget, health and safety management dedication and good exemplary practices conducted by management. Zhu, Fan, Fu and Clissold (2010) indicated that management needs to address employees ' issues while formulating safety policies for the company.

Cascio (2011) theorised that workable policy should be formulated to seek to provide effective control of the safety and health risks, to maintain all equipment in a good and safe working condition, ensure safe handling and use of electrical equipment and consult with workers and client on safety matters. Subsequently, Cascio further indicated that besides the workable policy, it is important to also to provide adequate workplace instruction, information and

supervision to workers and provide adequate safety training to workers. In addition, Cascio emphasised that management should ensure only competent workers carry out task, ensure that administration tasks are performed in a safety manner, always maintain a healthy and safe working site conditions and assess potential hazards with the usage of public signalled.

The government should play a role in the legal enforcement of health and safety regulations in the different workplaces (especially the administrative offices) and should be involved in the creation of safety programs as suggested by Tam et al. (2004). Hinze and Gambatese (2003) instigated those measures which positively influence the safety performance of administrators include minimising or eliminating the turnover of employees and increasing the size of a company. Hare et al. (2006) theorised that at the pre-planning stage of management, health and safety would be combined. He added that design and management resources should be improved to militate the variables that hinder the introduction of a traditional health and safety program. Hinze and Matthes (2009) argued that project safety inspections should be carried out to provide information on the physical condition of the workplace to insure work against injuries in the workplace.

Abudayyeh et al. (2006) instigated the elimination or reduction of the costs arising from workplace injuries by dedicated workplace safety initiatives. It was also indicated that there is a clear link between management's attention to health and the incidence of accidents and disease compared to the workplace. However, Ndjoulou, Desmarais and Pérusse (2015) juxtaposed that safety is the sole responsibility of workers in each trade, to mitigate safety risks and hazards. They added that the factories and stores act, confer responsibilities on workers to undertake the following practices: examine the safety of machinery before its operation, apply protective covering to machine parts such as surfaces and screens

with respect to computers that might be exposed to bad conditions and undertake preventive maintenance services periodically.

**Measures to Improve Administrators Workplace Safety**

Rudin (2015) identified four measures as necessary to ensure the safety of workers. It executes full verification of safety performance, processes and programmes against approved standards. The measures include developing an effective safety reporting system, to formulate a package for tracking and analysing workplace accidents, to ensure continual involvement of administrators, management and safety and health practitioners to enhance safety performance and to maintain the work environment to approved Health and Safety Standards.

Gambatese (2015) on the other hand recommended that for administrative workers, safety should be taken into consideration during the design stage of their work. Design of the work to be done by these administrators should be professionally done to mitigate the workplace safety hazards as this is one of the best and viable control measures for work safety and health. Roozeboom, Houtman and Bossche (2008) instigated that it is mandatory for employers to provide adequate equipment as protection for administration workers against noise, especially where the level of noise exceeds 85 decibels. To overcome such problems relating to safety, an implementation of a safety program has been identified as one of the significant methods (Aksorn & Hadikusumo, 2008). O'Connor et al. (2005) suggested that adequate training of health and safety should be provided to administration workers. A safety performance measure should be frequently employed depending on the workplace's standard to eliminate the rate of incidence of injuries (Hinze & Matthes, 2009).

**Measures to Enhance Employee Health and Wellbeing**

Gillen et al. (2002) theorised that there is the need for management to create an awareness regarding the work practices that are dangerous and detrimental to the health of workers. They further added that administration workers who are committed to health and safety practices should be well acknowledged and rewarded, this will serve as an incitement for them to continue such act in a manner that is acceptable in the industry. These interventions will mitigate the severity and incidence of workplace accidents. Rajendran and Gambatese (2009) resolved that there is the need for management to provide enough motivation to workers to realise the successful outcomes of implementing the safety and health concept in practice.

Lingard (2002) stipulated that training in first aid affects positively the employees' motivation. This training helps mitigate illnesses and injuries associated with the administration occupation and improve the workers‟ safety and health behaviour. First aid training also provides an awareness to participants to be responsible as their personal behaviour is a major contributing factor to the risk of injuries and illness. He concluded that first aid training has a positive effect in the prevention of health and safety risks and should complement occupational safety and health training programs, as this would provide a lot of benefits to organisations.

Rudin (2005) also estimated the following measures as necessary health and safety procedures.

1. Educate workers on dangerous practices that can lead to muscular-skeletal and mental health problems.
2. Adopt measures that will mitigate employee sick leave drastically.
3. Refer injured workers for medical attention immediately in the event of accident.

4. Encourage safe and appropriate working methods

The key measures needed for the practical implementation of health and safety concept in design include: a change in the perception of designers toward administration safety; the need to establish a motivational measure to promote safety in designing; increase the level of awareness of designers on the concept safety; integrate the knowledge of administration safety in the design phase; employ competent designers who are knowledgeable about safety design modifications; make available safety tools, guidelines references for designers; and mitigate the exposure of designers to liability (Gambatese, 2015).

**Empirical Review**

Employee health and safety practices are essential to any organisation's human resources to identify immediate and future health and safety needs. It ensures the well-being of the workers, productivity and the corporate image of organisations (Donkor, 2012). Bentil (2018) conducted a study on occupational health and safety (OHS) knowledge and practices of workers in the Anglo Gold Ashanti Iduapriem gold mine Ghana limited, Tarkwa. The study examines problems and issues related to OHS at Anglo Gold Ashanti Iduapriem Gold Mine Ghana Limited, Tarkwa, using a cross-sectional descriptive survey. The random sampling technique was adopted for the study to select two hundred (200) persons selected across all sections of the company. The findings revealed that though the OHS policies of the company were adequate and upheld to many of the times, there are reported cases of accidents and incidents which appear on the ascendancy.

Similarly, Ganson (2014) assessed the effectiveness of health and safety practices at Anglo Gold Ashanti Company, Obuasi mines. The researcher followed both stratified and simple random sampling methods in gathering quantitative data from respondents who are workers at both Anglo Gold Ashanti's

managerial / supervisory positions and junior staff. After assessing the efficacy of health and safety policies at Anglo Gold Ashanti Company Ltd, the researcher found that over 50% of the respondents strongly agreed that the company provides a safe workplace for all employees and nearly two-thirds agreed that the company ensures that employees are not exposed to unreasonable workplace risks and that the company encourages employees to record near minor workplace injuries.

Nonetheless, more than 50 percent of the respondents strongly agreed that lack of management engagement, worker failure to disclose minor injuries or near misses, and the costs involved in training workers on health and safety in the business are major problems. The study suggests that Anglo Gold Ashanti management not only provide appropriate protective clothing but also set up a monitoring team to go round and check if the workers are putting on their protective clothing and materials (Ganson, 2014).

Cudjoe (2011) also conducted a study on assessment of OHS practices on job performance at the Tetteh Quarshie Memorial Hospital, Mampong-Akuapem. Among other things, the study aimed at explored the impact of OHS on job performance. The study involved 80 workers including physicians / officers, supervisors, technicians, cooks, nurses, and midwives in the hospital departments and units. Data were collected from books, journals, and online through questionnaires, interviews, and analysis of relevant literature. It was discovered that hospital's existing OHS policies were insufficient. Employee engagement and compliance with health and safety regulations were also poor. It was recommended that hospital management appoint a safety committee and provide daily supervision, inspection and evaluation, and perform performance reviews. The report only discussed workplace health and safety on delivery of healthcare, therefore the research cannot be generalised.

A study by Donkor (2012) evaluated of health and safety practices and policies at Electricity Company of Ghana, using sample from Ashanti East Region. The goal was to assess the policies and practices on health and safety at the company, with the use of 109 respondents, including one top-level management, nine middle-level management, 25 front-line officers and gang leaders, and 74 lower-level employees. The study found a higher level of awareness of ECG protection policies, but large numbers of such workers do not know the content of such policy. The study further revealed that when workers are not well secured, they usually suffer electrical shocks, burns, and conductor cut. The study also revealed that safety preparation, tracking, and implementation at the different ECG rates are being carried out. Nonetheless, it was found that health and safety policy was not being fully implemented as 50% of respondents have had no health and safety training. That implies that for lack of knowledge, a larger majority of ECG employees did not follow the policy. It was proposed that all new and existing staff be educated and trained so that the health and safety problems in the policy are identified to all personnel.

Nana-Otoo (2014) conducted a study on OHS issues in the informal manufacturing sector of Cape Coast Metropolis. The purpose of the study was to explore the main health and safety issues faced by informal manufacturing sector workers in Cape Coast Metropolis to suggest preventive and control measures. The study adopted the qualitative research design to study 10 workers each from the informal food processing, textile and garments, wood processing, and metal work categories. Convenience sampling was adopted to select the workers, and purposive sampling was used to select officials of the National Board for Small Scale Industries and the Department of Factories Inspectorate. The study revealed a significant institutional gap in the provision of health and safety to informal manufacturing workers.

It also showed that some institutions are under resourced in their service delivery. The research further revealed that informal manufacturing sector workers do not have the necessary awareness, technical means, and resources to implement health and safety measures, and that there was the need for a long-term strategy to be developed to address the issues (Nana-Otoo, 2014). The use of convenience sampling for sample selection is likely to bias the results of the study (Mackey & Gass, 2005). Also, because of the high possibility of self-selection in non-probability sampling, the impact of the outliers in this form of subject selection may be more devastating. On the contrary, neither prejudices nor their effects are quantified in a convenience survey (Hatch & Lazaraton, 1991).

In fact, the researcher does not know how well a convenience sample will represent the population with respect to the characteristics under investigation. What makes samples of convenience so volatile is their susceptibility to certain secret prejudices (Leiner, 2014) which means that the results obtained devour the validity and reliability of the study. Bernardo (2009) conducted a study on the effect on workplace safety across the United States of America with focus on occupational safety and health management. The research targeted and intended to evaluate the efficacy of the Occupational Safety and Health Administration (OSHA) in minimising injuries and deaths at work in the United States of America.

This study used available data from the regression models such as multiple regression and ordinary least square regression to assess the agency's effect on workplace injuries and deaths. A reliable time series for occupational fatality data was created, which reconciled historical data and current fatality data. This time series was regressed using business, cultural, and labour force factors to assess whether OSHA was responsible for the changes in occupational fatalities. Regression models were also developed using data on occupational injury and

disease as well as business, cultural and labour force variables to assess if improvements in injury and disease data were due to OSHA (Bernardo, 2009).

The results revealed that higher budget levels for the department have resulted in fewer workplace injury and illness accidents. Expenditure allocations in all models tested using injury data have shown that higher budget allocations have resulted in fewer job injuries. Other jobs and economic models were not free of catastrophic auto regression and could not be used. Nonetheless, the findings for occupational fatalities were not as straightforward, and when using organisation, cultural, or labour force variables with the overall number of occupational fatalities, they did not produce models free from fatal auto-regression. The number of inspections had the desired results by considering the disparity in deaths from year to year (Bernardo, 2009).

The results of the ordinary least squares (OLS) regression models using occupational injury data indicates that the agency budget is an important and significant variable in ensuring that the agency meets it mission. A recommendation from this research is to ensure that agency is adequate funded and showing a presence in the workplace through enforcement and outreach activities (Bernardo, 2009).

Nyoh (2015) conducted a study on the effect of OHS on job performance (productivity) of employees of blue skies Ghana limited. The mixed method approach and a cross-sectional survey design were adopted in gathering the data for the study. The study shows that there is high level of knowledge among the employees concerning health and safety at work and therefore have positive attitude to OHS issues in the firm. The study also revealed that the management has a view that healthy staff makes healthy organisation which also increases productivity in the firm and hence management has put in place measures to ensure staff's health and safety. The author concluded that Blue Skies Ghana

takes the safety and health of the employees seriously and have programs to increase their knowledge about workplace safety and health and strictly enforces these safety measures.

Fordjour (2015) conducted a study on factors inhibiting the implementation of OHS in the Ghanaian construction industry. The study was limited to some selected (32) construction firms in Kumasi, using 100 respondents selected by non-probability sampling method. This study revealed that, disorganised and transient workforce, temporary nature of construction projects, fixed cost of project, unavailability and insufficient OHS policy, little priority given to OHS and poor commitment of managers and workers to OHS inhibit the implementation of OHS in the sector (Fordjour, 2015). The study concluded that poor health and safety performance of the Ghanaian construction industry is due to behavioural issues of negligence and/ or carelessness on the part of construction managers and workers. It is recommended that construction managers create awareness on OHS; make provision for regular health services; ensure adherence to regulations and standards of OHS; make provision for PPE and enforce their utilisation and undertake a risk assessment on health and safety periodically (Fordjour).

**Health and Safety Challenges Associated with the Use of Computer**

The use of personal computer (PC) has grown tremendously to the extent that millions of people around the world are use computers daily. There have been fears on the potential health problems that computer users may face, the worries that made producers to react by preparing and distributing articles to counter its effects on computer market growth. Consequently, numerous studies have been conducted worldwide in attempt to specifically determine the nature and extent to which health hazards may be present from prolong exposure to computer (Vos et al., 2018). Computer related preventable injuries cover a wide variety of health

problems caused by or contributed to computer usage. The prolong usage or exposure of computers results in many injuries to the user (Kuckelman et al., 2018; Vos et al., 2018) in the form of radiations as well as explosion (Parihar et al., 2016), and visual effects (Maples-Keller et al., 2017). The most common reported medical problems are eye strain, carpal tunnel syndrome (CTS), neck and back strain, conjunctivitis (itchy, bloodshot eyes), and dermatitis (Lockwood, 1999).

According to Gregg (1972) of American Optometric Association, in the United States, using a computer can have an impact on the operator. Computer use is a known risk factor for pain and musculoskeletal disorders and arthritis sufferers are more at risk because of difficulties performing tasks due to pain, restricted movement, muscle weakness, or fatigue (Gregg, 1972). A new study by researchers at the University of Pittsburgh has examined this topic in people with rheumatoid arthritis, osteoarthritis and fibromyalgia. The study involved 315 arthritis patients who completed a specially designed survey that contained questions on computer use, discomfort experienced while using a chair, desk, keyboard, mouse and monitor, and problems associated with each piece of equipment. The results showed 75% of people with arthritis experience both discomfort and problems that could lead to work limitations: other problems experienced included finding a comfortable position while using the computer and in manipulating the keyboard and mouse.

Another relatively significant effect of using computer has to do with the critical issue of experiencing back pain. Computer use health effect is a common problem seen in 4 out of 5 persons at any point of life, caused due to long hours of working in front of computer or bad posture while using the computer and lack of practicing relaxing exercises before using the computers (Ashwini, 2010). Back pain is one of the most common reasons people go to the doctor or miss work, and

it is a leading cause of disability worldwide. Most people have back pain at least once. Fortunately, you can take measures to prevent or relieve most back pain episodes. If prevention fails, simple home treatment and proper body mechanics often will heal your back within a few weeks and keep it functional. Surgery is rarely needed to treat back pain. The symptoms include muscle ache, shooting or stabbing pain, pain that radiates down your leg, pain that worsens with bending, lifting, standing or walking and pain that improves reclining.

Carpal Tunnel Syndrome (CTS) are idiopathic median neuropathy at the carpal tunnel. The path of physiology is not completely understood but can be considered compression of the median nerve travelling through the carpal tunnel (Peng & He, 2018). The main symptom of CTS is intermittent numbness of the thumb, index, long and radial half of the ring finger. The numbness usually occurs at night because we tend to sleep with our wrists flexed and is relieved by wearing a wrist splint that prevents flexion. Long-standing CTS leads to permanent nerve damage with constant numbness, atrophy of some of the muscles of the thinner eminence, and weakness of palmar abduction (You, Huang, Wen & Chen, 2017). CTS is considered by some to be a form of repetitive stress injury, and as such, is caused by repetitive motions, most famously from long hours of computer keyboard use.

Repetitive strain injury: These 'keyboard wrist pads' appear to be the equivalent of knuckle pads, which may develop due to chronic pressure or friction (Agrawal & Rajajeyakumar, 2018; Cheung, Clemson, O'Loughlin, & Shuttleworth, 2018). Wrist pain is often caused by sprains or fractures from sudden injuries. But wrist pain can also result from long-term problems, such as repetitive stress, arthritis and carpal tunnel syndrome. Because so many factors can lead to wrist pain, diagnosing the exact cause can be difficult, but an accurate diagnosis is essential for proper treatment and healing. Wrist pain may vary,

depending on the cause. For example, osteoarthritis pain is often described as being like a dull toothache, while carpal tunnel syndrome usually causes a pins-and-needles feeling or a tingling sensation, especially at night. The precise location of your wrist pain also provides clues to what's behind your symptoms.

Computer Vision Syndrome is another effect associated with computer usage. Computers have significantly impacted cognitive, social, physical, and various other aspects of the modern daily lives of computer users (Mullan, 2018). Extensive literature in ergonomics and optometry has indicated that computer use is closely associated with various visual problems, which are referred to as Computer Vision Syndrome (CVS) in medical science (LeBlanc, Gunnell, Barnes, & Chaput, 2017; Örün & Akbulut, 2019).

Obesity is equally a health issue that is common to computer users. Computer use involves the use of a few muscles, the advent of the computer and its involvement in virtually every aspect of modern-day living has greatly reduced the amount of life activities that involves whole body muscular exercise. Further, many people spend their spare and leisure time on additional computer related activities such as texting, playing video games and on the Internet rather than in outdoor activities. These factors make the body produce excessive cortisol a hormonal biochemical produced by the body and which has been shown to be one of the culprits responsible for obesity (Jimison & Pavel, 2024).

Ranasinghe et al. (2016) invited 2500 computer office workers for the study from all nine provinces of Sri Lanka between May and December 2009. A self-administered questionnaire was used to collect socio-demographic data, symptoms of computer related injuries and its associated factors. A binary logistic regression analysis was performed in all patients with computer related injuries as the dichotomous dependent variable and age, gender, duration of occupation, daily computer usage, pre-existing eye disease, not using a visual display terminal

(VDT) filter, adjusting brightness of screen, use of contact lenses, angle of gaze and ergonomic practices knowledge as the continuous/dichotomous independent variables. A similar binary logistic regression analysis was performed in all workers with injuries as the dichotomous dependent variable and other continuous/dichotomous independent variables (Ranasinghe et al., 2016).

The sample size was 2210 (response rate - 88.4 %). Mean age was 30.8 ± 8.1 years and 50.8 % of the sample were males. The 1-year prevalence of computer related injuries in the study population was 67.4 %. Female gender (OR: 1.28), duration of occupation (OR: 1.07), daily computer usage (1.10), pre-existing eye disease (OR: 4.49), not using a VDT filter (OR: 1.02), use of contact lenses (OR: 3.21) and ergonomics practices knowledge (OR: 1.24) all were associated with significantly presence of CVS. The duration of occupation (OR: 1.04) and presence of pre-existing eye disease (OR: 1.54) were significantly associated with the presence of injuries (Ranasinghe et al., 2016).

The results revealed that Sri Lankan computer workers had a high prevalence of computer related injuries. Female gender, longer duration of occupation, higher daily computer usage, pre-existing eye disease, not using a VDT filter, use of contact lenses and higher ergonomics practices knowledge all were associated with significantly with the presence of computer related injuries. The factors associated with the severity of injuries were the duration of occupation and presence of pre-existing eye disease (Ranasinghe et al., 2016).

**Level of Knowledge on Hazards Associated with the Use of Computers**

Khan, Surti, Rehman and Ali (2012) examined the knowledge and practice of ergonomics among 344 computer users and concluded that about half of the computer users were not aware of the standard operating procedures and the importance of ergonomics in computer usage. Computer users who claimed that they were aware, were unable to relate their knowledge to practice from hazard

and health perspective. An observational cross-sectional survey was used, questionnaires were answered by the respondents and the results were analysed with SPSS. Sirajudee and Siddik (2017) also conducted a study among students in engineering and information technology and assessed their level of knowledge in computer ergonomics which affirms the findings of Khan et al. Generally, respondents were not aware of ergonomic hazards associated with computer usage. Most of them did not have knowledge of good postures regarding the hand, elbow and wrist. Also, respondents lacked knowledge on the type of chair (five-legged wheeled chair) as well as sitting position and the mouse was not placed correctly. With regards to the monitor, it must be tilted in a way to keep the eye level at a certain angle. However, respondents were not aware of these SOP's.

Another survey by Zwilling, Lesjak, Phusavat and Anussornnitisarn (2019), they examined health problems with the use of information technologies. The adopted a quantitative approach and randomly sampled 315 workers in public administration offices across Kenya. It was revealed that some of the users of computer technologies are not even aware of their health-related problems that they have. However, the study failed to consider the length of usage of computers. Sitaula and Khatri (2018) also observed poor knowledge and practice among 236 (first to fourth year) medical students regarding computer vision syndrome. However, they considered the length of computer usage by the respondents and concluded that, majority of them spent two to three hours a day on their computers and were considered to have a high risk of developing computer vision syndrome. Only a few (22.9%) had prior knowledge about the syndrome and were putting knowledge to practice. A descriptive cross-sectional study was employed, and questionnaires were also used to obtain information from the students.

**Health and Safety Measures for Computer Usage**

Brizga, Peks, Imants and Bertaitis (2013) examined the computer use impact on students' health in the context of ecological approach to occupational safety. The aim of the study is to find out whether the changes in the process of computer use initiate appropriate changes in the environment arranged for computer use. The theoretical basis of the study is the ecological approach, which has been transformed from Uri Bronfenbrenner's ecological theory of human development and its triangulation with ergonomics. An ecological experiment and triangulation of data collection to determine the impact of computer use on the students' health have been carried out.

The study revealed that the intensity of the use of computers increased and more than 70 % of the respondents consider that their knowledge on how to use computers is sufficient to ensure that they use them in compliance with the requirements of ergonomics for computer use. All respondents had more than five years' experience in the use of computers. However, almost 90 % of respondents, including employees and future specialists of occupational health and safety, do not follow the conditions set out for healthy work with a computer. As a result, 95 % respondents have identified symptoms testifying that the use of computers has an adverse effect on health. The key factors are ocular discomfort, pain in one's back or shoulders and wrist joints. It is therefore particularly important to continue the study on the causes of non-compliance with the occupational health and safety requirements and minimization of their effect (Brizga et al., 2013).

**Relationship between Knowledge on Hazards and Occupational Health and Safety Practices**

Ibrahim (2018) reported that approximately 22% of computer users have muscular-skeletal problems such as neck pain, back pain, waist pain and shoulder problem besides carpel tunnel syndrome. Ibrahim concluded that such problems

can be made worse by poor workstation design, bad posture and poor workstation design. Ibrahim further noted that sitting for long periods reduces blood flow to the muscles, tendons and ligaments. The study consisting of 250 workers in South Africa, Ibrahim sought to examine the relationship between knowledge on hazards and occupational health and safety practices. The study used descriptive design and frequency analysis.

It was revealed that majority of computer users only possess enough knowledge to perform basic tasks, especially job related. However, most of them lack any technical knowledge to solve even the basic technical problem. It was observed that 90% of computer users do not have any safety measures in place to prevent them from the most basic hazards and risk of injuries. About 70% of computer users do not observe recommended safety procedures.

Nuñez and Villanueva (2011) examined the impacts of information technology on public administration by using analysis of empirical research from the "golden age" of transformation. A mixed method was adopted and the results revealed that a higher incidence of negative impacts tend to involve the more subjective effects of information technology on people in their roles as private citizens. However, the study failed to consider health implications.

**Computer Use Associated Health and Safety Challenges as a Result of Socio-Demographic Variables**

In a study titled computer users at risk: health disorders associated with prolonged computer use Ellahia, Khalilb and Akram (2011) investigated the association between extent of computer use (per day) and carpal tunnel syndrome, computer stress syndrome, computer vision syndrome and musculoskeletal problems. In addition, Ellahia et al. (2011) investigated the extent of simultaneous occurrence of carpal tunnel syndrome, stress, computer vision syndrome and musculoskeletal disorders among computer users. The study adopted an

exploratory design with a sample consisting of 120 employees and students. Self-administered questionnaire was used as an instrument in this field survey study.

The findings confirmed that computer-related health disorders such as carpal tunnel syndrome, stress, computer vision syndrome and musculoskeletal disorders occur simultaneously among prolonged computer users such as employees and students. The simultaneous occurrence of carpal tunnel syndrome, stress, computer vision syndrome and musculoskeletal disorders is more among employees than students and those who are both employees and students. Employees who use computers daily for more than four hours are more likely subjected to the risks of all these four health disorders. The study concludes that by observing some rules of using computers, minimizing and treating these disorders are possible (Ellahia et al., 2011).

In a cross-sectional study of German students on the influence of sociodemographic and health characteristics on online health information seekers, socio-demographic variables such as age, gender, relationship status and employment status were considered. Secondary data of 2000 students were used, and the results were analysed using logistic regression. It was found out that women were more likely to seek health related information on the internet than men. All the respondents were over 18 years and those who were relatively younger had higher health information seeking behaviour. This affirms their findings on the variable, "self-perceived health", that the older you get, your perception of being healthy is low. Similarly, people who had life partners and those in employment were also more likely to seek information relating to health online (Nölke, Mensing, Krämer, & Hornberg, 2015).

Another study was done by Unegbu, Amaechi, Njoku and Opara (2015) on influence of socio-demographic variables on the use of ICT by lecturers. This was done in the south-east and south-south regions of Nigeria and looked at the

effect of age, gender and academic rank of lecturers on the use of ICT. The design used was the descriptive survey and one hundred and sixty-two (162) respondents were involved. Respondents were found to be very knowledgeable when it comes to computer usage and was revealed that, age did not influence their vision in the use of ICT rather they experience waist pain because of their age which negatively impacts their computer usage. For this group of respondents, being a male or female does not define they use computers for their work. However, academic status made a lot of difference in terms enthusiasm about computer usage (70.3%). While it was stress-free and exciting for most of the respondents, others were apprehensive even though they know how use ICT.

Ajuwon and Popoola (2014) found a significant relationship between demographic factors and the retrieval of health information from the internet. They adopted a quantitative approach and collected data across 13 healthcare institution in the south-west of Nigeria. Descriptive statistics, specifically, Pearson Moment correlation as well as multiple regression were used to analyse the results. On one hand, age, gender, educational qualification, and designation, all had influenced health information seeking behaviour of the respondents. On the other hand, years of experience, marital status, among others did not influence information seeking on related issues.

**Conceptual Framework**

It was observed that computer usage, level of knowledge about hazards with computer usage, health and safety provisions influence health and safety of worker. However, factors such as socio-economic variables can influence the extent of the impact of the independent variable on the dependent variable hence are considered the intervening variables. Just like many other situations, there are factors that influence the relationship between dependent and independent variables that the researcher cannot control. These are the control variables.

The review of literature indicated that there are many factors that influence the use of computers by administrators. The work of administrators in UCC and similar institutions is at the operational level of activities in the school. It includes working long hours during the day, using cognitive ability of compile and interpret document and collate other information to suit different agenda and work requirements. For these reasons, administrators are predisposed to stress and fatigue besides other health related issues such as spinal pain, joint pain, neck ache and various eye problems. Such health-related issues possess numerous challenges to administrators in terms of efficiency and effectiveness. There are other socioeconomic variables that may influence the impact of these challenges on the administrator's ability to use computers to enhance their work. Further other issues such as intuitional requirements, level of knowledge, intervention measures by management and job descriptions. It is for these reasons that the study seeks to examine the causality between the use of computers and the health challenges administrators encounter besides the role of socioeconomic variables.

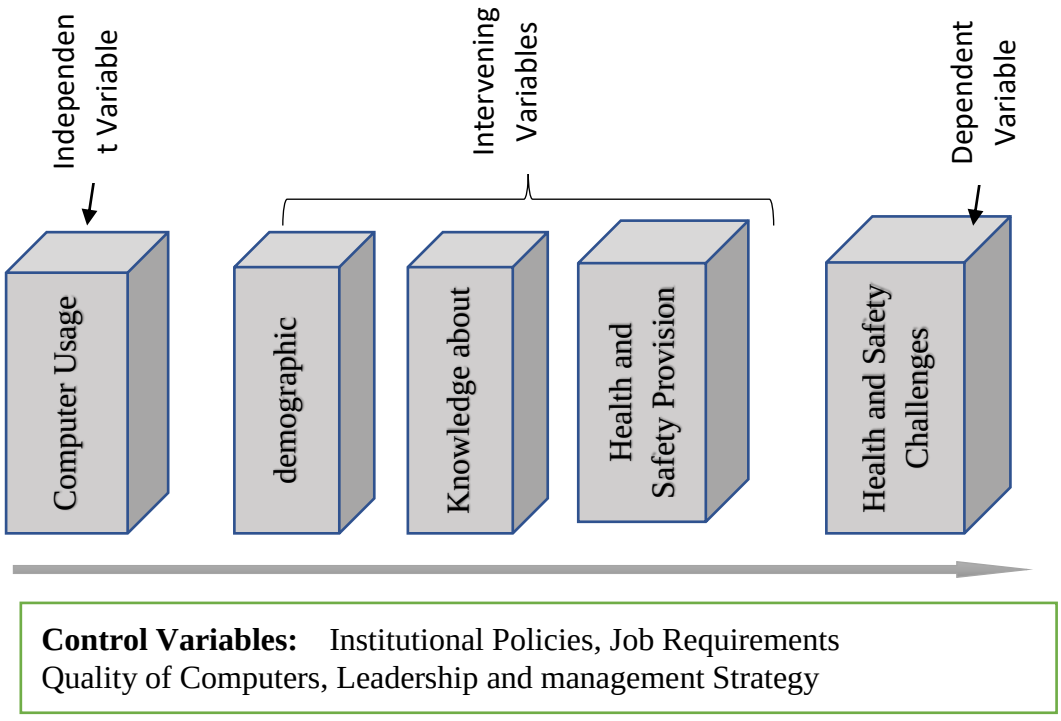


Figure 3: Conceptual Base of the Study

**Summary**

From the review of the literature the processes of OHS are necessary in every workplace to promote and protect the health of employees, prevent the causes of and / or control diseases and injuries that may be experienced. This gives way to long-term employee development and capacity building. Theories that explain the causes and effects of accidents in the working environment have also been discussed. Examples of these theories are Heinrich Domino, System Model, Peterson's Accident Model, Ferrell's Human Factor and the Swiss Cheese Models. They largely have clarified the role of both management and employees in preventing these accidents.

# CHAPTER THREE

# RESEARCH METHOD

The purpose of the study was to examine the effects of the use of computers and associated factors on health and safety of administrators in UCC and establish the influence of socio-demographic factors in the frequency of health and safety problems among employees. This section presents details of the research design, study area, the population, sampling techniques, instrument for data collection, data collection processes, and analysis.

## Research Design

A descriptive cross-sectional design was adopted to guide the study. Descriptive cross-sectional studies are adaptable and helpful since they show present circumstances and requirements, especially for researchers (Osuala, 2001). The descriptive design is suitable for the current investigation since it gives the researcher the chance to look for explanations from perspectives of the respondents regarding the health and safety aspects of computer usage (Ponterotto, 2005). Further, the descriptive design is ideal for studying opinions or perception of respondents about a phenomenon because it has the benefit of generating a substantial number of replies from a diverse group of individuals. In addition, it attempts to explain people's views and behaviour by utilizing data collected at a specific moment in time, while also painting a meaningful picture of the events (Fraenkel & Wallen, 1993).

However, because descriptive surveys probe into personal topics about which respondents might not be entirely honest, they may yield answers that are not entirely trustworthy. According to Check and Schutt (2011) some of the ways to mitigate this weakness is to clarify to the participants the aim of the research,

assure them of their anonymity and confidentiality, and give them maximum time to respond to every item on the questionnaire.

**Study Area**

The research was conducted on the main campus of UCC. The university is a public collegiate university situated on a seafront along the Gulf of Guinea in Cape Coast town, Central Region, Ghana. The university was established in 1962 out of a dire need for highly qualified and skilled manpower in education. It was established to train graduate teachers for second cycle institutions such as teacher training colleges and technical institutions. The university has since added to its functions the training of doctors and other health care professionals, as well as education planners, administrators, and agriculturalists (UCC Public Relations Office, 2019).

**Population**

The research focused on the main campus of UCC. The university has a total of 1,539 Senior Staff of which 943 are males and 596 are females. The total number of administrators is about 828 consisting of 212 clerks, 119 Administrative Assistants (AA), 171 Senior Administrative Assistants (SAA), 212 Principal Administrative Assistants (PAA), 24 chief Administrative Assistants (CAA) and 90 Senior Member Administrators [Junior Assistant Registrars (JAR) and Senior Assistant Registrars (SAR)]. These categories of workers perform administrative functions and are spread across different colleges, schools, directorates, and residential halls of the University (UCC, 2023).

For all the ranks, the administrator must be a computer literate. They all perform some administrative duties such as take minutes during meetings, typing, scanning, filing and photocopying but some may have less, or additional duties based on their ranks. For instance, clerks use the computer to type minutes and

reports written by their superiors (AA, SAA, PAA & CAA – in ascending order), record incoming and outgoing letters and filing (UCC, 2017). Only CAAs, JARs and SARs have the mandate to organise in-service training.

Moreover, JARs and SARs perform higher administrative functions such as planning, organising, coordinating and controlling at the college or school level and management level (offices of the Vice-Chancellor, Pro-Vice Chancellor and Registrar at the central administration of the University). Apart from the clerks, all administrators play supervisory roles over subordinates (UCC, 2017).

**Sampling Procedure**

Hair (2000) defined sampling as the process of selecting a subset of people from a target population for a study. Similarly, Bryman and Cramer (2009) explained sampling as the process of choosing the target population units for the study. In estimating the study's sample, the sum of 828 administrators was used which was to total number of administrators. All administrators at the time were included in the survey because even though minimal computer literacy is expected of the clerk, they also perform administrative functions that may require the use of a computer. Therefore, they could not be excluded from the research. A census is an endeavour to enumerate every component within a group and quantify one or more of those components' attributes. A census can yield comprehensive data on all or many population components. There are two key advantages for employing the census method. First, the census method is more accurate and reliable. Secondly, it rules out possibility of any personal biases that would have occur when employing sample selection (Guest, 2019). However, a key disadvantage of the census method is the challenge of dealing with non-response rate. More often, census method can result in high non-response rate when covering a very large population.

**Data Collection Instrument**

A questionnaire served as the primary data collection tool. Thus, questionnaires were employed to gather information from administrator in the University. The questionnaire is composed of a distinct series of questions that are produced and given to the respondents to get their opinions on the many research-related subjects (Krosnick, 2018). According to Krosnick, adopting a questionnaire has several benefits, including lower costs and simpler administration. Also, they facilitate group management and, among other things, enable the researcher to guarantee anonymity. However, Troyer and Rich (2018) claim that because they offer a practical means of obtaining data from a particular group, questionnaires are among the most often used approaches in academic research. According to Loza (2018), creating questionnaires is an extremely difficult process that calls for considerable knowledge of research methodology in general and questioning techniques in particular, in addition to methodological proficiency.

The data collection instrument was adopted from the literature review and modified to suit the context of this research (Douven, 2018). The instrument was made up of thirty-seven (37) questions spread under four sections (A, B, C and D). Section A's questions focused on the respondent's sociodemographic data of respondent such as gender and age academic level, job rank and number of years of using the computer for work. Responses in this section were used to determine the extent to which respondent’s computer use health and safety challenges are influenced by it. Whereas questions on respondent’s level of awareness of health hazards related to computer usage were asked in section B, questions on computer use associated health challenges such as ‘Do you have any eye problems as a result of using the computer?’ were asked in section C. In section D questions on

safety measures provided by management of the organisation for respondents were asked to know what the organisation is already doing vis-à-vis evidence-based measures that ensure health and safety when using the computer.

The four sections of the instrument had eight (8), seven (7), sixteen (16) and five (5) number of questions respectively. Moreover, the questions in the research instrument were of open and close ended nature. Questions in sections A and C were of open and close ended nature, where they were to either answer 'yes' or 'no' or indicate the appropriate response in writing. Also, questions in sections B and D of the instrument were of solely closed ended nature. Respondents had to provide either a 'yes' or 'no' answer or indicate the extent to which the agreed, disagreed or were indifferent about a question asked based on a Likert five-point scale of measure.

For each question, numeric coding was assigned before analysing in SPSS. Questions that required either a 'yes' or 'no' answer were assigned '1' or 'o' respectively. Numeric values from 1 to 6 were assigned to questions with more than two responses whereas questions that required respondents to select more than one response had '1' or 'o' value assigned to each of the responses. Also, responses that were provided based on a Likert scale were assigned in ascending order, for example, strongly disagree (1), disagree (2), not sure (3), agree (4), and strongly agree (5).

**Pre-testing**

The pre-test was carried out at the Cape Coast Technical University (CCTU) whose respondents had similar characteristics to respondents in the main survey. The CCTU is situated in the Eyifua community in Cape Coast Metropolis (North Constituency) which is mandated to provide higher education (Diplomas, Bachelors and Post-Graduate Programs) in Technical, Vocational, Engineering,

Arts, Business and Applied Sciences. From the results below the Cronbach's Alpha obtained after testing for reliability or comparing the amount of shared variance among the various items of the research instrument were within the acceptable range (0.8> a ≥ 0.7). The reliability value for section B, which bordered on respondents' awareness of health hazards associated with the use of computers, was .895. A reliability value of .879 was recorded for section D, on safety measures provided by management (Taber, 2018).

**Table 1a: Item-Total Statistics awareness level**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| Awareness1 | 8.86 | 3.618 | .065 | .088 | .819 |
| Awareness2 | 8.59 | 2.827 | .440 | .264 | .852 |
| Awareness3 | 8.54 | 2.581 | .594 | .446 | .806 |
| Awareness4 | 8.36 | 3.019 | .271 | .150 | .899 |
| Awareness5 | 8.41 | 2.590 | .556 | .433 | .817 |
| Awareness6 | 8.37 | 2.707 | .475 | .308 | .841 |
| Awareness7 | 8.32 | 2.865 | .376 | .205 | .870 |
| Awareness8 | 8.45 | 2.812 | .549 | .446 | .854 |
| Awareness9 | 8.67 | 3.019 | .217 | .146 | .897 |
| Awareness10 | 8.88 | 2.920 | .565 | .436 | .871 |
| Awareness11 | 8.79 | 2.770 | .457 | .380 | .814 |

**Table 1b: Item-Total Statistics for Safety Measures**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| SM1 | 6.5621 | 3.256 | .519 | .438 | .914 |
| SM2 | 6.4237 | 3.327 | .653 | .501 | .838 |
| SM3 | 6.8721 | 3.201 | .492 | .422 | .827 |
| SM4 | 6.8250 | 3.465 | .687 | .473 | .843 |
| SM5 | 6.8085 | 3.143 | .653 | .295 | .845 |
| SM6 | 6.8190 | 3.341 | .492 | .372 | .854 |

**Data Collection Procedure**

Approval and supporting documents were taken from the Department of Health Physical Education and Recreations to further obtain ethical clearance from the Institutional Review Board of the university. Details of the study was explained, and an informed consent was obtained from each participant before the questionnaire was filled. This was made possible on the first page of the instrument where participants were asked to sign and date a consent form to indicate that they have read, understood and agree to take part in the research. The participants were made aware that they had the right to and freedom to decline and withdraw from the study at any time without a consequence. They were assured that the study poses no harm to neither of them as individual administrators nor their various offices. No personal information that would identify a participant was required. All information obtained was safely secured on a laptop computer with a password and used only for the purpose of the research.

The data collection took place during the period of sever COVID-19. Thus, the questionnaire was sent to participants through their emails (online). The researcher put the instrument into Google Forms and generated a link which was sent to the emails of participants through their various secretariats. That is, the Ghana Association of University Administrators (GAUA) Secretariat, Senior and Junior Staff Sections of the Directorate of Human Resource. To have access to the instrument, participants had to just click on the link. The first interface had the consent form where a brief description of the survey is placed. After reading and understanding, participants then had the opportunity to tick whether they want to take part in the survey or not. Telephone numbers of the researcher and the supervisor were provided on the page for participants who might want some more

clarification. To further ensure a smooth data collection process, all ethical issues were strictly observed. The researcher was available either by phone or in person to attend to challenges faced by respondents during the process.

During data collection, the researcher observed that even though the survey link was resent to respondents intermittently and over a period of four (4) months, the number of responses kept increasing at a decreasing rate. This necessitated the introduction of a face-to-face survey. Questionnaires were then printed and distributed to administrators who had not attempted the online survey. The instrument was left with the respondent to fill and collected later (after 2-3 days) which was communicated to the respondent. Also, if any administrator misplaces the questionnaire, a new one was issued out to replace the lost one. This was to ensure a representation of data collection among administrators.

**Data Processing and Analysis**

Upon the retrieval of the questionnaires, the responses were thoroughly examined to ensure that the respondents obeyed the instructions pertaining to each question. Data that was retrieved from Google Forms (online) were excel format and numbered serially. Since each respondent had a serial number the face-to-face was added or continued from the last serial number of the Google Forms. While data coding and entry was done in SPSS, data cleaning, management and analysis were done in STATA. Descriptive analysis was performed to validate the data. Furthermore, a reliability test was determined by the Cronbach's Alpha values for every question category. For the first three research objectives, descriptive statistics was used to analyse. Specifically, it was used to calculate the mean responses and their corresponding standard deviation values for the first and third research questions whereas percentages and frequencies were used in the analysis

of the second research question. The mean response gives the average summarised indication of respondent's opinion about each question.

For the fourth and fifth research questions, chi-square was employed to determine the relationship between administrator's knowledge on hazards and safety practices in the use of computers (research question 4). The chi-square statistics is sensitive to sample size. A test becomes invalid if the sample size is smaller than 50 and a sample of 500 is also regarded as too large. This makes it appropriate for this survey with a sample size of 281. Given the non-parametric nature of the distribution of data, Chi-square provides robust estimates for understanding the statistical significance of the association between the categorical variables. Thus, compared to other inferential statistical tool, chi-square test gives the researcher considerable information about performance of the study group. It also helps the researcher to understand the difference between the observed and the expected results (Stata, 2015).

Also, inferential statistics like logistic regression was used for research question five to ascertain the degree to which safety and health challenges associated with computer usage are influence by socio-demographic characteristics of the administrators and the Odd Ratios (OR) were reported. It is important to emphasise that, with OR, the interpretation has no link with the sign of the coefficient. Rather, OR uses a benchmark of 1 and thus any variable with a coefficient value that fall below 1 indicates less likelihood and those that fall above 1 implies more likelihood (Hilbe, 2009).

# CHAPTER FOUR

# RESULTS AND DISCUSSIONS

The purpose of the study was to examine the effects of the use of computers and associated factors on health and safety of administrators in UCC and establish the influence of socio-demographic variables on the incidence of health and safety challenges among the workers. This chapter presents the results of the study and discussion.

## Background Information of the Respondents

Majority of the respondents in the study are males representing 54.8% while their female counterparts constituted 45.2%. Table 2 shows the study's sample distribution by age, marital Status, educational level and sections of the university where they work. From the table, most of the respondents are married, about 31.67% are single while the remaining belong to other marital groups (such as divorced, widowed). Majority (48.04%) of the respondents are at least within the 30-39 age bracket. Overall, most (85.5%) of the respondents have at least a graduate degree and at the senior rank administrative positions (89%). Most (20.28%) of the respondents were from the Central Administration (CENAD), followed by the College of Agriculture and Natural Sciences (CANS) (17.79%) and College of Humanities and Legal Studies (CHLS) (15.3%) and 3.91% from the College of Distance Education (CODE).

**Table 2: Background Information of the Respondents**

| **College** | **%** |
|---|---|
| AH | 4.27 |
| CANS | 17.79 |
| CENT AD | 24.56 |
| CHLS | 15.3 |
| CODE | 3.91 |
| COES | 8.9 |
| COHAS | 9.96 |
| DICTS | 6.05 |
| KNH | 0.71 |
| OGUAA H | 2.14 |
| SJL | 6.41 |
| **Age** | **%** |
| 20-29 | 17.08 |
| 30-39 | 48.04 |
| 40-49 | 26.33 |
| 50-59 | 8.54 |
| **Marital status** | **%** |
| Single | 31.67 |
| Married | 63.35 |
| Living with a partner | 1.78 |
| Separated/Divorced | 1.78 |
| Widow/widower | 1.42 |
| **Educational levels** | **%** |
| Postgraduate | 48.4 |
| Graduate | 37.01 |
| Diploma | 10.68 |
| Advance Level | 0.71 |
| Ordinal Level | 1.07 |
| Senior High School | 2.14 |
| **Rank** | **%** |
| Senior Member Administrator | 14.59 |
| Senior Staff Administrator | 74.38 |
| Junior Staff Administrator | 11.03 |
| **N** | **281** |

**Research Question 1: What is the Level of Awareness and Knowledge of Administrators in UCC about Health Hazards Associated with the Usage of Computers at Work?**

This research question sought to determine the level of awareness and knowledge of health hazards associated with the use of computers among administrators at UCC. Thus, this research question was addressed in two parts. For the first part, respondents were asked in a series of close-ended questions to indicate their level of awareness using 'Yes' or 'No' responses. For the second part, respondents in a series knowledge-based statements on health hazards associated with computer usage were asked to indicate their levels of agreements.

**Level of Awareness of Administrators in UCC about Health Hazards Associated with the Usage of Computers at Work**

Table 3a presents results on respondents' levels of awareness about the health hazards associated with the usage of computer at work. The results show that 94.66% of the administrators, representing the majority, are aware of the health hazards associated with computer use. Similarly, 58.36% said they do not know how long the computer monitor should be from the user. Likewise, about 67.57% said they were not aware of what the height of the chair should be from the ground. Only 30.25% of the administrators were aware of the kind of work surface suitable for computer users. The results show that even though most of the administrators seems to have high level of awareness that there are health effects associated with computer usage, they lack the adequate knowledge of these health effects (see Table 3a).

**Table 3a: Awareness and knowledge of health hazards associated with use of computer**

| Awareness of health hazards associated with use of computer | Yes | No |
|---|---|---|
| Are you aware of the health hazards associated with computer use | 94.66 | 5.34 |
| I know what the distance between the monitor and the user should be. | 41.64 | 58.36 |
| I know what the distance from the keyboard to the user's body should be. | 25.27 | 74.73 |
| I know what the alignment of the keyboard should be from the user's body. | 32.74 | 67.26 |
| I am aware of what the height of the chair should be from the ground. | 38.43 | 61.57 |
| I know the kind of work surface suitable for computer users. | 30.25 | 69.75 |
| **N** | **281** | |

**Knowledge of Administrators in UCC about Health Hazards Associated with the Usage of Computers at Work**

Table 3b presents results on knowledge of administrators about the health hazard associated with the usage of computers. Table 3b showed that the participants agreed to the statement, 'Pain can be caused by doing repetitive work. This came with a mean value of 3.98 (SD = 1.14). The participants also agreed that pain can be caused by uncomfortable working postures (M = 4.52: SD = 0.85. Again, the participants agreed that placing the mouse too close to the body can cause repetitive strain disorder (M = 4.09: SD =1.1). With a mean of 4.5 (SD = 0.89), the participants agreed that pain can be caused by incorrect screen settings. From the results, the respondents generally attest to the fact that not using computers in the right way such as following the standard operating procedures can cause harm to the user.

**Table 3b: Knowledge of health hazards associated with use of computer**

| Knowledge on health hazards associated with use of computer | Yes | No |
|---|---|---|
| **Items** | **Mean** | **SD** |
| Pain can be caused by doing repetitive work | 3.979 | 1.143 |
| Pain can be caused by uncomfortable working postures. | 4.516 | .849 |
| Placing the mouse too close to your body can cause repetitive strain disorder | 4.085 | 1.099 |
| Pain can be caused by incorrect screen settings | 4.495 | .891 |
| Pain can be caused by carrying out task for long periods without suitable rest breaks | 4.030 | 1.099 |
| Overstretching for the mouse can cause repetitive strain disorder. | 4.491 | .879 |
| **Grand mean** | **4.268** | **1.000** |

Note: The Mean value, strongly agree (SA)=4.5-5.00, Agree(A)=3,5-4.4, Undecided (UN)=2.5-3.4, Disagree (‘AD) =1.5-2.4 and strongly disagree (SD)=1-1.4

The findings revealed that majority of the administrators do not demonstrate proper understanding of the standard operating procedures when using computers to prevent related health hazards. In a similar study, Meyers et al. (2019) noted that some employees do not know the standard operating procedure and the health challenges they are likely to face as they use computers at work. As a result, they tend to use their computers several hours without observing the necessary health and safety measures. This could be attributed to management failure to pay more attention to employees’ level of awareness and understanding of health and safety measures implemented in the workplace (Bennett, 2009). Meyers et al. stated that the operations of occupational health and safety are to protect and promote employees’ health, reduce occupational causes, and conditions that are harmful. Governments, trade unions, insurance companies, and the public are therefore, increasingly demanding that employers provide a safe and healthy work environment for employees (Kasperson, 2019). This is to ensure that employees are trained on the use and management of the health and safety measures. According to Kasperson, employers expect employees to know and use the measures in place but most often fail to ensure compliance.

Omari et al. (2018) also opined that organisational polices on health and safety fail to consider compliance and penalties for such violations. Hence, many employees use computer and other related electronic accessories without adherence to health and safety protocols. Similarly, Adeniyi et al. (2018) found that majority of workers in developing economies are not even aware of the health and safety measures related to their work, let alone request for protective equipment. It suffices to conclude that the current findings agree with most studies that, though administrators in UCC are aware that there are health and safety challenges associated to their work, but they lack adequate knowledge on appropriate measures.

Based on the nature of the administrator's response, it can be said that most of them know how to use the computers in terms of their body position to the computer. However, they have demonstrated insufficient knowledge regarding the positioning of the computer accessories to convenient usage. This means that the administrators do not have adequate knowledge on the appropriate standard operational procedures for using computers to avoid harm (Agrawal & Rajajeyakumar, 2018; Cheung et al., 2018; Gregg, 1972). In a related study, Fang et al. (2004) said that to ensure safety and efficiency at various offices, employees should be trained on handling workplace equipment and ensure compliance to right proper use procedures. It is shown that the management of occupational health and safety is important in recognising significant work-related hazards.

In Lingard and Rowlinson (2010), the systematic review showed that several studies have advocated a behaviour-based approach for health and safety management and have been reported to successfully improve safety efficiency in urban settings. In a similar study, Raymond and Hinze (2017) suggested that employee awareness, knowledge and safety management should be take on by

employers. Also, Ibrahim (2018) and Nuñez and Villanueva (2011) said that the knowledge level of computer users influences their exposure to its health-associated challenges. Nevertheless, employers must take innovative methodologies to promote health and safety at work. These innovative solutions must be appropriate for staff that frequently change their jobs and thus have insufficient access to health and safety promotion initiatives.

**Research Question 2: What are the Computer Use Health Challenges of Administrators in UCC?**

The purpose of this research question was to determine the challenges associated with computer usage among administrators in UCC. Seven close-ended items were generated on a two Likert scale ('Yes' or 'No') for the respondents to indicate whether they experience such challenges when using the computer. Their responses were analysed using descriptive statistics (frequencies and percentages) and presented in Table 4.

From table 4, it can be observed that majority of the administrator (72.24%) had back pain whilst 62.63% experience different eye problems after using the computer for extensive period. Conversely, more than half (65.12%) of the administrator did not experience numbness in their legs whilst using the computer for their administrative tasks. This could mean that either they do not sit or spend too much time behind their computers, or they take regular breaks from their computers. In the same way, 51.79% of the administrator did not have headaches but 50.18% complained of shoulder pains. It can, therefore, be said that though the administrators had different health issues, the number of administrators who experienced a particular health challenge varied extensively.

The findings showed that most of the administrators encountered pain in different parts of their bodies. Though this claim may seem univocal, the evidence

shows that back pain, neck pain and shoulder pain (72.24, 67.26 and 50.15 respectively) were the most reported by the administrators (Basakci Calik, Yagci, Oztop, & Caglar, 2022). On the other hand, health problems like headache, numbness and waist pains were minimal among the administrators. Since most of the administrators reported eye problems, further investigations revealed their specific eye problems which are: eye ache; watery eyes; double vision; dry eyes; and eye strain. It is worth mentioning that the administrators suffered at least one eye problem mentioned in Table 4, even though not above 50%.

Evidence in literature which shows that staring at a computer screen all day is bad for the eyes (Akinbinu & Mashalla, 2014). Although using a computer may not harm the eyes, staring at a computer screen all day will contribute to eyestrain or tired eyes. Moreover, failing to adjust lighting so that it does not create a glare or harsh reflection on the screen may also lead to some eye problems. The finding indicates that a significant proportion of the administrators in UCC might be facing health challenges due to the usage of computers even though they are aware of the health hazards associated with computer usage. This assertion can be attributed to the fact that administrators in UCC are involved in tasks such as students' admission process and records keeping, produce examination results and transcripts, finance and human resources database, management information systems, web-based admissions services, staff administration and other routine activities of the University. All these tasks require long period of sitting down at one place focusing the eyes on the computer.

The current findings affirm the position of Kuckelman et al. (2018) and Vos et al. (2018) who noted that the prolong usage or exposure to computers results in many injuries to the user. Similarly, Maples-Keller et al. (2017) and

Petitta et al (2019) also agreed that when computers are used over time or without safety measures, it results in a series of problems such as backaches, vision problems, headaches, and fatigue. Furthermore, the results support the argument made by Parihar et al., (2016) that if the chair on which the employee sits to use the computer is not good enough to cater for spine protection, then the user is likely to suffer backaches, spinal injuries waist pain and so on. However, if proper protective measures are taken, they eradicate these health problems.

**Table 4: Computer use health challenges of Administrators in UCC**

| **Do you experience any of the following after using computer continuously for an hour or more?** | **Yes** | **No** |
|---|---|---|
| Eye problems | 62.63 | 37.37 |
| Back pain | 72.24 | 27.76 |
| Neck pain | 67.26 | 32.74 |
| numbness in your legs | 34.88 | 65.12 |
| wrist pain | 47.69 | 52.31 |
| shoulder pain | 50.18 | 49.82 |
| Headache | 48.21 | 51.79 |
| **N** | **281** | |
| **Eye problems type** | **Yes** | **No** |
| Eye ache | 39.19 | 60.81 |
| Watery eyes | 20.27 | 79.73 |
| Double vision | 22.97 | 77.03 |
| Dry eyes | 32.43 | 67.57 |
| Eye strain | 31.08 | 68.92 |
| Blurred vision | 33.78 | 66.22 |
| **N** | **176** | |

Apart from the above-mentioned challenges, other discomfort the respondents do experience after using the computer continuously for an hour or more include dizziness, fatigue, tiredness wrist pain, and stress.

**Persistence of health challenges**

All administrating Every UCC staff working and management is supposed to work eight hours each day except for a few in upper management, thus, the administrators typically work eight hours a day and spend not less than 70% of the time sitting behind the computer (Cagnie, Danneels, Van-Tiggelen, De-Loose, & Cambier, 2007). This is expected since they perform clerical duties to help their respective offices and the university as a whole run smoothly and efficiently. For these reasons, the administrators were asked to give an estimate of how long they have endured these health challenges because of the prolong use of computers each day. The study does not assume a direct correlation between how long they experienced the symptoms with how long they have work as administrator. It can be observed in figure 4 that a greater number (91%) of the administrators have experienced the health challenges for one to two years. Only 9% of the administrators have experienced the health symptoms for between three to eight years.

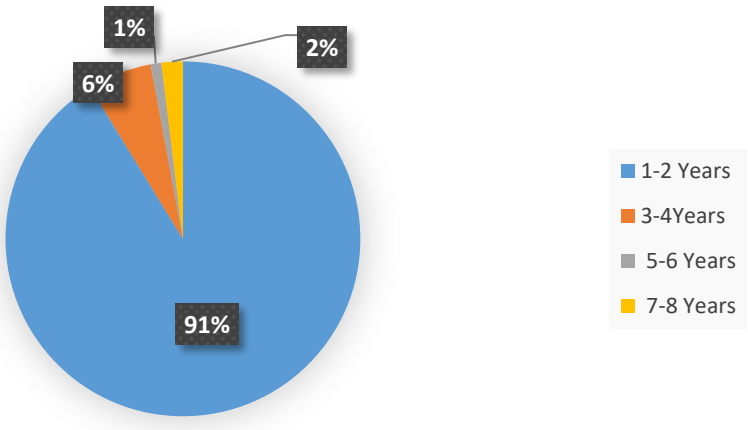


Figure 4: Duration of Symptom

**Diagnosed health challenges of administrator**

The administrators were probed to determine if they sought medical attention to their health problems which results from the prolong use of

computers for their job. An overwhelming majority (72%) of the administrators admitted that they have never sought medical assistance from the hospital about their health challenges. The few (28%) who reported their health challenges at the hospital were diagnosed of various illnesses.

In figure 5, just 9.38% of the administrators were diagnosed of carpal tunnel syndrome, however, most of them suffered computer vision syndrome followed by musculoskeletal disorder. These findings are consistent with the literature. For instance, Ellahia et al. (2011) found that computer-related health disorders such as carpal tunnel syndrome, stress, computer vision syndrome and musculoskeletal disorders occur simultaneously among prolonged computer users such as employees and students. Also, Green, (2008) and Tsauo, Jang, Du, and Liang, (2007) found evidence of neck pains associated with using computer and noted that the employees sought medical care without necessarily reporting to their superiors.

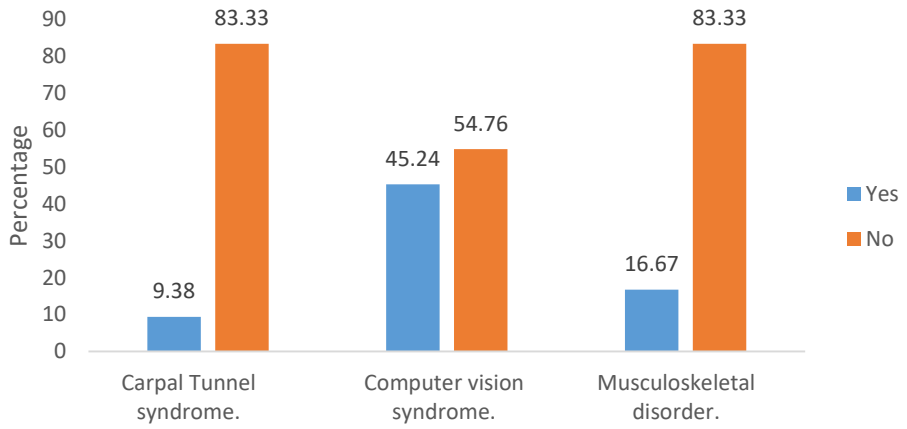


Figure 5: Diagnosed health challenges of administrators

Some absenteeism was reported because of the above-mentioned challenges. Further investigation revealed that 78.43% of the administrators never absented themselves and had to endure these health challenges to work. Meanwhile, about 21% absenting themselves from work because of the health

challenges they have because of using the computer for their work. From the literature non-fatal accidents that result in work-related illnesses lead to approximately 3 days of absence from work (ILO, 2015). This compound the workload of other employees which reduces their efficiency. This has the potential of retarding productivity or overall good of the institution. Among those who could not report to work due to the computer associated health challenges, it took one to three days (19.24 percent) to return to their duties. Others took almost a week (5.8 percent) and in some cases more than two weeks (2 percent) before getting back to work.

On the other hand, subsequent information gathered revealed that only 19.24% of the administrators took some days off due to computer related health problems. About 5.8% took a week off whilst 2% were off duty for at least two weeks. This absenteeism provides grounds to conclude that computer related health issues did not impede majority of administrators to take many days off. However, it could also mean that they reported these health challenges on time and received quality healthcare which resulted in rapid recovery or making the administrators healthy enough to work through their medication period.

To buttress the study's findings, evidence from the work of Teo and Ling (2005) revealed that identified factors that influence safety performance negatively and increase the likelihood of accidents as including derisory company policy, poor safety practices, unsafe attitudes of workers, poor commitment of management, inadequate knowledge on health and safety and inappropriate training of administration workers. Tam, Ravi, Dai and Tan (2004) revealed that health and safety management issues include: insufficient procurement of protective equipment, frequent safety meetings, ineffective or inadequate health

and safety training, low knowledge of health and safety management, reluctance on the part of stakeholders to invest in safety services and lax administration.

Further, most organisations have health services for their staff and either fully or partially finance almost all medication conditions. Alshagga, et. al. (2013) also observed duration of computer usage to be associated with neck, shoulder and back pains. Similarly, Ming, Närhi and Siivola (2004) found that neck and shoulder pain symptoms are very common among intensive computer users. Similar findings have been reported by Dighriri et al. (2019) in Saudi Arabia. Diepenmaat, Van der Wal, De Vet and Hirasing (2006) found Neck and shoulder, low back, and arm pain, physical inactivity, stress, and depression to be related to computer use.

Blumenberg et al. (2021) recently found that the length of time in using computers and mobile devices to be associated with back, neck and mid-back pains. Smith, Louw, Crous and Grimmer-Somers (2009) found evidence on prevalence of neck pain and headaches because of computer use. Further, Khorasani, Tavafian and Zarei (2018) found status of Musculoskeletal Pains and Disorders among Computer Users.

**Research Question 3: What are the Health and Safety Measures Provided for Administrators on Computer Usage by the Authorities in UCC?**

The research question sought to determine the health and safety measures that are in place for administrators to ameliorate the adverse health effects that emanate from computer usage. The administrators were asked to indicate the extent to which they agree that the university management has made available health and safety measures to mitigate the chances of developing health issues in the use of computers for their work. Six questions were asked (5 were Likert scale and only 1 was dichotomous) and their responses were analysed using mean and standard deviation. Based on their mean responses, in Table 5, the

administrators averagely agreed (Mean=3.633, SD=1.530) that management provides protective computer accessories such as screen protectors for computer use. They also agreed that management ensures that workstations are designed and set up in a way that promote and protect their health and well-being. Likewise, the respondents on average agreed (Mean=3.760; SD=1.04) that management organises training on computer use safety for administrators.

Further, the administrators averagely agreed that (Mean=3.441, SD=1.499) management conducts annual computer use risk assessment as well as in-service training on safety practices for administrators. All administrators go through medical screening when they are employed as a prerequisite and also once a year, on their date of birth, but this does not include the screening on musculoskeletal disorder. In summary, the majority of the administrators agreed that the management of UCC provides some health and safety measures in the use of computers to carry out their daily tasks and to mitigate the possibility of health problems (grand means response = 3.645, standard deviation = 1.456).

**Table 5: Safety Measures Provided by Management of UCC**

| Item | Mean Response | SD |
|---|---|---|
| Management provides protective computer accessories such as screen protectors etc. for administrators who use computers. | 3.633 | 1.530 |
| Management conducts annual computer use risk assessment. | 3.441 | 1.499 |
| Management ensures that workstations are designed and set-up in a way that promotes and protects the health and well-being of administrators. | 3.705 | 1.415 |
| Management conducts medical screening of the eyes, waist, back, wrist etc. for all administrators. | 3.658 | 1.4510 |
| Management organises in-service training on safety practices for administrators. | 2.790 | 1.384 |
| Management organises training on computer use safety for administrators. | 3.760 | 1.040 |
| **Grand mean** | **3.645** | **1.456** |

Note: The Mean value, strongly agree (SA)=4.5-5.00, Agree(A)=3.5-4.4, Undecided (UN)=2.5-3.4, Disagree (DA)=1.5-2.4 and strongly disagree (SD)=1-1.4.

The findings indicate that when management of organisations provide health and safety measures for their workers to ensure their well-being, it promotes productivity, and elevates corporate image of organisations (Bentil, 2018; Donkor, 2012; Ganson, 2014).

Many employers seldom take employees through rigorous training to ensure a detailed awareness, operational skills in managing the health and safety measures and the technical "know how" to employ in times of a hazard (WHO, 2011). Therefore, they do not declare the requirements for job safety to employees when they are recruited. Alsamawi et al. (2017) found that the production and promotion of a healthy and safe work environment go together with improving the physical, mental and social well-being of workers. Furthermore, the researchers reported that creating a safe work environment supports the development and preservation of work capacity, as well as professional and social advancement during the working life of employees. This contributes to improvement in the workplace and gives workers the opportunity to conduct socially and economically productive lives and contributes positively to sustainable development. Alsamawi et al. concluded that this can only be achieved if employees are trained on health and safety measures implemented at the workplace.

Based on the 'Unified Condition of Service' for unionized staff for the public universities in Ghana of which the University of Cape Coast is a member (UCC, 2023) all staff are supposed to seek healthcare services from the university's hospital and submit the receipt of their bills to the finance department for reimbursement. Article 21- Health and Safety of Employees, states that "the University shall take such measures as will ensure the good health and safety of its employees in accordance with the provisions of factories, officers and shops

Act, 1970 (Act 328) or any amendment thereof". Article 22 - Compensation for injury: any employee who sustains any injury or suffers disability, illness or disease in course of performance of their duties shall be entitled to compensation in accordance with the Workmen's Compensation Law 1987 (PNDCL 187) and any subsequent enactment. Also, according to Article-23 on Medical Care, subsection a), an employee shall receive without charge medical, dental and optical care from the University's Medical Officer or a health practitioner to whom an employee had been directed in advance by a University Medical Officer provided that the University shall not be responsible for subsistence cost in hospital. Subsection b) indicates that the same medical treatment could be received at a medical facility belonging to any of the Universities (UCC, 2023). Also, subsections c, d, and e specify that all costs of medical appliances including spectacles and drugs prescribed by a University Medical Officer shall be reimbursed by the University as well as travel costs in Ghana relating to medical care so long as the employee shall return to the University.

It suffices to assume that most of the administrators did not report to their superior because they had sought medical help from the university's hospital. Stated differently, most administrators will not complain to their superiors about these health challenges because they would just be redirected to visit the university hospital and given a few days off as recommended by the International Labor Organisation (ILO, 2015). (Mean=3.441, SD=1.499).

**Research Question 4: What is the Relationship between UCC Administrators' Knowledge on Health Hazards and Safety Practices in the Use of Computers?**

The objective of this research question is to establish whether there is a significant association between the administrators' knowledge on health hazards and safety practices when using computers for their work. In the first step, the

study used all seven items of knowledge about health hazards to classify respondents into two groups (i.e., 'Yes' and 'Not') based on whether they have any knowledge on health hazards or otherwise. The 'Yes' group represent administrators who have high knowledge of health hazards while the 'No' group represent administrators with poor knowledge of such health hazards. In the second stage a Pearson chi-square test of association for the two categorical distributions (Yes against No) was performed across the main indicators of health and safety measures provided by the University of Cape Coast (see Table 6). Specifically, the five main indicators of safety measures employed were computer accessories, annual risk assessment, set-up workstations, medical screening and in-service training.

**Table 6: Relationship between UCC administrators' knowledge of hazards and occupational health and their safety practices in the use of computers**

| Level of agreement | Computer Accessories | | Annual risk assessment | | set-up work station | | Medical screening | | In-service training | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Strongly disagreed | 42.86 | 13.14 | 14.29 | 17.52 | 14.29 | 14.6 | 14.29 | 14.6 | 28.57 | 12.41 |
| Disagreed | 14.29 | 11.68 | 14.29 | 13.14 | 0 | 6.93 | 14.29 | 9.12 | 28.57 | 6.57 |
| Undecided | 0 | 12.77 | 0 | 11.68 | 14.29 | 10.95 | 28.57 | 12.04 | 28.57 | 12.04 |
| Agreed | 14.29 | 15.69 | 42.86 | 23.36 | 42.86 | 28.47 | 42.86 | 23.72 | 14.29 | 26.28 |
| Strongly agreed | 28.57 | 46.72 | 28.57 | 34.31 | 28.57 | 39.05 | 0 | 40.51 | 0 | 42.7 |
| **$\chi 2$** | **5.770**** | | **2.019***** | | **1.238***** | | **3.363***** | | **2.215**** | |
| **Cramér's V** | **0.243** | | **0.321** | | **0.267** | | **0.601** | | **0.421** | |

**$\chi 2$** is the Pearson Chi-Square test of association

**Cramér's V** shows the direction (positive or negative) and strength of the association

*** p<0.01 reflect statistical significance at one percent

** p<0.05 reflect statistical significance at five percent

* p<0 reflects statistical significance at ten percent

It is expected that those who are assertive in their responses will use computer accessories, take part in workshops and therefore have some basic knowledge on SOPs which was acquired from the training organised by management on computer use safety. Table 6 reports results for the relationship between administrators' knowledge of hazards and management's provision of safety measures. As shown by the Pearson's chi-square test of independence for the two categorical distributions (Yes against No). For instance, regarding 'computer accessories', among respondents who have high knowledge of the hazards (i.e., the Yes group), 62.41 percent either agreed or strongly agreed that management provides protective computer accessories such as screen protectors, etc. for administrators who use computers. On the contrary, for the 'No' group, 42.86 percent either agreed or strongly agreed that management provides protective computer accessories such as screen protectors, etc. for administrators who use computers. Given the p-value of 0.002<0.05 and Cramer's V of 0.0.243, it can be inferred that there is a statistically significant relationship between administrators' knowledge of hazards and management's provision of safety measures. This has been explained by Jones-Berry (2018) that although employers make available some safety measures for employees, they either find them inconvenient or lacks the know-how and therefore ignores or do not adhere to the safety measures provided by management.

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Similarly, as reported, across the remaining health and safety measures, most of the administrators who have knowledge of hazards (i.e., the Yes group) can easily spot (either agree or strongly agreed) the safety measures provided by management compared to their counterparts with no knowledge (i.e., the No group). Most importantly, the p-value and Cramer's V for these remaining dimensions of safety measures are as follows. Annual risk assessment (p-value 0.006<0.05, Cramer V=0.321), set-up workstation (p-value 0.018<0.05, Cramer's V=0.267), medical screening (p-value 0.001<0.05, Cramer's V=0.601) and in-services training (p-value 0.032<0.05, Cramer's V=0.421). A critical look at the

Cramer's V values across the five safety measures suggests that knowledge level is highly positively associated with medical screening (Cramer's V=0.601), followed by in-service training on computer use and practices (Cramer's V=0.421) was annual risk assessment matches up closely (Cramer's V=0.321).

As derived from the system model theory, a harmonious relationship exists between administrators (given that they have adequate knowledge), computers (all accessories provided) and their environment (availability of health and safety measures such as training) and under this circumstance, the incident of an accident occurring is minimal. However, a change or disruption in this harmony for instance no or inadequate knowledge of computer hazards, lack of computer accessories or training intensifies the tendency of the occurrence of an accident (Arghish, Tavakkoli-Moghaddam, & Rezaeian, 2018; Chen et al., 2017). What this means is that when administrators do not have knowledge of hazards, they will not be able to recognize safety measures even when management strives to put in place such measures compared to when administrators have knowledge of such hazards. Crucially, the implication of this finding is that when administrators have knowledge of hazards, they will be able to appreciate or recognize efforts put in place by management to mitigate the health challenges associated with computer usage.

**Research Question 5: What is the Extent to which Health and Safety Challenges Associated with Computer Usage Influenced by Socio-demographic Variables of Administrators in UCC?**

In this analysis, seven health challenges are examined as dependent variables: Eye pain, neck pain, back pain, numbness, wrist pain, shoulder pain, and headache. A binary logistic regression was employed and each of these response variables was measured as a dummy variable that takes a value of 1 if the respondent reported ever experiencing the said challenge and 0 if otherwise. Thus, the Odds Ratios (OR) are reported in Table 7. The study first runs some model diagnostics to avoid spurious regressions. Under the last three rows of Table 7, the study reports the P-values from running a model specification test which is implemented in STATA using the command "linktest". The p-values for all the models are insignificant indicating the model is correctly specified and devoid of any omitted variable bias. Next, to ascertain the fitness of the model, the study implemented the Hosmer-Lemeshow goodies-of-fit test, and the P-values are reported in the last two rows of Table 7. As shown in the last two rows of Table 7, the P-value for each of the seven models are non-significant indicating that our models fit are reasonably well. Haven validated these model diagnostics; the study proceeds with the interpretation of the main results as follows.

In Table 7, to ascertain the fitness of the model, it is imperative to consider the coefficient of determination (R2). Across all the models, the coefficient of determination is at least 10.1 percent. Precisely, model 1, the coefficient of determination is 0.281 and it means the model can explain 28.1 percent of the variation in eye pain. The coefficient of determination for model 2 is 0.279 and it means the model can explain 27.9 percent of the variations in back pain. The coefficient of determination for model 3 is 0.185 and it means that model can explain 18.5 percent of the variation in neck pain.

**Table 7: Influence of socio-demographic variables of the administrators on Health and Safety challenges**

| VARIABLES | (1) Eye pain Odds Ratio | (2) Backpain Odds Ratio | (3) Neck pain Odds Ratio | (4) Numbness Odds Ratio | (5) Wrist pain Odds Ratio | (6) Shoulder pain Odds Ratio | (7) Headache Odds Ratio |
|---|---|---|---|---|---|---|---|
| Knowledge | 0.058** | -0.281** | -0.195* | -0.001** | -0.230** | -0.223** | -0.086** |
| | (0.014) | (0.126) | (0.109) | (0.099) | (0.099) | (0.007) | (0.005) |
| **Safety measures provided by management** | | | | | | | |
| Accessories | -0.251*** | -0.535 | -0.467 | -0.373** | -0.585** | -0.463 | -0.582** |
| | (0.475) | (0.520) | (0.442) | (0.017) | (0.008) | (0.397) | (0.001) |
| Risk assessment | -0.667** | -0.940** | -0.337 | 0.296 | 0.042 | -0.219 | 0.005 |
| | (0.042) | (0.004) | (0.421) | (0.421) | (0.380) | (0.381) | (0.381) |
| Setup | 0.151** | 0.377** | 0.428 | -0.551** | 0.639 | 0.663 | 0.746** |
| | (0.508) | (0.025) | (0.478) | (0.026) | (0.424) | (0.424) | (0.017) |
| Screening | -0.211** | -0.189** | -0.108 | -0.288 | -0.539 | -0.105** | -0.219** |
| | (0.016) | (0.568) | (0.444) | (0.392) | (0.378) | (0.007) | (0.082) |
| Training | -0.091*** | -0.650** | -0.990** | 0.217** | -0.564** | -0.421** | -0.580** |
| | (0.415) | (0.002) | (0.407) | (0.065) | (0.046) | (0.042) | (0.108) |
| **Sociodemographic** | | | | | | | |
| Female (ref=male) | 1.255*** | 0.907** | 1.007*** | 0.756** | 0.100 | 0.445 | 0.196 |
| | (0.347) | (0.372) | (0.333) | (0.304) | (0.281) | (0.282) | (0.284) |
| **Age (ref= below 30 years)** | | | | | | | |
| 30-39 | 0.832 | 0.883 | 0.659 | -0.423 | -0.017 | 0.091 | -0.387 |
| | (0.567) | (0.610) | (0.573) | (0.498) | (0.486) | (0.486) | (0.489) |
| 40-49 | 1.711** | 2.044*** | 0.825 | -0.573 | -0.441 | -0.554 | -0.232 |
| | (0.683) | (0.761) | (0.657) | (0.583) | (0.562) | (0.558) | (0.567) |
| 50-59 | 1.101 | 0.702 | 0.735 | -0.176 | -0.215 | 0.362 | -0.807 |
| | (0.808) | (0.853) | (0.792) | (0.769) | (0.727) | (0.711) | (0.734) |

**Table 7 continued**

| VARIABLES | (1) Eye pain Odds Ratio | (2) Backpain Odds Ratio | (3) Neck pain Odds Ratio | (4) Numbness Odds Ratio | (5) Wrist pain Odds Ratio | (6) Shoulder pain Odds Ratio | (7) Headache Odds Ratio |
|---|---|---|---|---|---|---|---|
| **marital status (ref= single)** | | | | | | | |
| Married | -0.486 | -0.168 | -0.222 | 0.456 | 0.371 | -0.008 | 0.219 |
| | (0.436) | (0.456) | (0.413) | (0.384) | (0.364) | (0.359) | (0.365) |
| With partner | -0.136 | 0.098 | | 0.337 | 0.225 | 0.912 | -1.058 |
| | (0.949) | (1.075) | | (0.716) | (0.689) | (0.733) | (0.761) |
| **Rank (ref= senior member Administrator)** | | | | | | | |
| Senior Adm. Staff | 1.983 | 2.933 | 2.445* | 1.193 | 2.390 | -3.519** | -1.155 |
| | (1.199) | (1.285) | (1.462) | (1.075) | (1.087) | (1.430) | (0.994) |
| Junior Adm. Staff | 2.356** | -2.017** | -1.303* | -3.253* | 2.169** | -1.087** | -1.950* |
| | (0.078) | (0.084) | (0.065) | (0.099) | (0.079) | (0.094) | (0.509) |
| **Education (ref=below diploma** | | | | | | | |
| Diploma | 2.224* | 1.561* | 2.120** | 1.355* | 1.587** | 1.326* | 1.129 |
| | (1.235) | (0.867) | (0.929) | (0.719) | (0.695) | (0.715) | (0.714) |
| Graduate | 0.435** | 0.035** | 0.321** | 0.904 | 0.942 | 0.498** | -0.042** |
| | (0.006) | (0.005) | (0.664) | (0.633) | (0.592) | (0.072) | (0.010) |
| Post Graduate | -0.530 | -0.688 | 0.842 | 0.213 | 0.052* | 0.124 | -0.206 |
| | (0.637) | (0.716) | (0.624) | (0.620) | (0.571) | (0.549) | (0.569) |
| **Years of computer use (ref=<6 years)** | | | | | | | |
| 6-10 years | -0.103 | -0.405 | -0.633 | -0.825* | -0.648 | -0.107 | -0.186 |
| | (0.446) | (0.495) | (0.459) | (0.429) | (0.402) | (0.396) | (0.398) |
| 11-15 years | -0.225 | -0.395 | -0.650 | -0.799* | -0.890** | -0.613 | -0.452 |
| | (0.497) | (0.545) | (0.500) | (0.468) | (0.438) | (0.434) | (0.441) |

**Table 7 continued**

| VARIABLES | (1) Eye pain Odds Ratio | (2) Backpain Odds Ratio | (3) Neck pain Odds Ratio | (4) Numbness Odds Ratio | (5) Wrist pain Odds Ratio | (6) Shoulder pain Odds Ratio | (7) Headache Odds Ratio |
|---|---|---|---|---|---|---|---|
| 16-20 years | 0.458 | -1.114* | -1.131** | -0.568 | 0.032 | 0.211 | -0.423 |
| | (0.573) | (0.628) | (0.559) | (0.531) | (0.492) | (0.494) | (0.497) |
| 21-25 years | 0.084 | 0.105 | -2.499** | -0.841 | -0.250 | 0.269 | 0.387 |
| | (1.339) | (1.386) | (1.125) | (1.000) | (0.960) | (0.990) | (0.973) |
| Above 25 years | 0.379 | -0.312 | -1.306 | -0.373 | 1.486 | -0.427 | -0.517 |
| | (1.085) | (1.542) | (1.028) | (0.948) | (1.206) | (1.025) | (1.099) |
| **Hour use (ref=<3 hours)** | | | | | | | |
| 3-4 hours | -0.300 | 2.355*** | 1.710*** | 0.476 | 0.882 | 0.432 | 0.052 |
| | (0.647) | (0.749) | (0.649) | (0.598) | (0.552) | (0.549) | (0.565) |
| 5-6 hours | -0.155 | 1.522*** | 1.080** | 0.292 | 0.142 | -0.053 | 0.462 |
| | (0.554) | (0.563) | (0.535) | (0.523) | (0.470) | (0.468) | (0.483) |
| 7-8 hours | -1.318** | 1.241** | 0.412 | 0.893* | 0.462 | -0.004 | 0.141 |
| | (0.571) | (0.575) | (0.548) | (0.524) | (0.476) | (0.478) | (0.488) |
| Above 9 hours | -0.937 | 1.090 | -0.208 | 1.223 | 0.607 | 0.220 | 0.460 |
| | (0.874) | (0.883) | (0.841) | (0.804) | (0.745) | (0.747) | (0.766) |
| **Colleges (ref=Others)** | | | | | | | |
| CANS | -0.847 | 1.056 | 0.810 | -0.238 | -0.516 | 1.113** | 2.015*** |
| | (0.655) | (0.766) | (0.629) | (0.542) | (0.534) | (0.553) | (0.639) |
| CHLS | -0.231 | -1.612** | 0.166 | -0.853 | -0.797 | -0.552 | 1.866*** |
| | (0.677) | (0.737) | (0.616) | (0.572) | (0.557) | (0.551) | (0.648) |
| COES | -0.173 | -0.399 | 0.039 | 0.509 | -0.140 | 0.492 | 1.699** |
| | (0.779) | (0.827) | (0.710) | (0.640) | (0.637) | (0.627) | (0.701) |
| | (0.766) | (0.806) | (0.691) | (0.638) | (0.606) | (0.599) | (0.691) |

**Table 7 continued**

| VARIABLES | (1) Eye pain Odds Ratio | (2) Backpain Odds Ratio | (3) Neck pain Odds Ratio | (4) Numbness Odds Ratio | (5) Wrist pain Odds Ratio | (6) Shoulder pain Odds Ratio | (7) Headache Odds Ratio |
|---|---|---|---|---|---|---|---|
| CoDE | -0.926 | -0.970 | -0.018 | -0.466 | -0.627 | 0.430 | 1.546* |
| | (0.986) | (1.004) | (0.874) | (0.856) | (0.820) | (0.834) | (0.887) |
| CENAD | -0.394 | -0.159 | 0.265 | -0.913 | -1.060* | -0.422 | 1.887*** |
| | (0.644) | (0.723) | (0.601) | (0.564) | (0.542) | (0.529) | (0.633) |
| DICTS | 0.490 | 0.416 | 3.664*** | 0.568 | -0.914 | -0.073 | 1.648** |
| | (0.935) | (0.917) | (1.283) | (0.755) | (0.737) | (0.744) | (0.809) |
| HALLS | -1.232 | -0.085 | -0.916 | -1.658** | -1.276* | -0.693 | 1.437* |
| | (0.809) | (0.858) | (0.749) | (0.808) | (0.683) | (0.660) | (0.741) |
| Constant | 1.317 | 3.145*** | 0.334 | -0.519 | 1.245 | 1.187 | -0.701 |
| | (1.060) | (1.196) | (1.039) | (0.972) | (0.915) | (0.906) | (0.975) |
| **Pseudo R2** | **0.281** | **0.279** | **0.185** | **0.132** | **0.116** | **0.101** | **0.118** |
| **P-value (LR test)** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** | **0.000** |
| **Linktest** | **0.186** | **0.639** | **0.359** | **0.777** | **0.129** | **0.587** | **0.714** |
| **Hosmer-Lemeshow** | **0.094** | **0.3938** | **0.0987** | **0.0580** | **0.0652** | **0.1047** | **0.062** |
| **Observations** | **281** | **281** | **281** | **281** | **281** | **281** | **281** |

*****p<0.01,**p<0.05,*p<0.1**

The finding relates to the link between safety measures provided by the management of UCC and the workers' chances of experiencing computer-associated health challenges. Generally, this study finds that safety measures provided by the management decrease the chances of workers experiencing challenges. For instance, relative to when management does not provide protective computer accessories such as screen protectors etc. for administrators, the likelihood of experiencing eye pain, back pain, neck pain, numbness, wrist pain, shoulder pain, and headache after continuously using a computer for an hour or more decreases by 25.1 percent, 53.5 percent, 46.7 percent, 37.3 percent, 58.5 percent, 46.3 percent, and 58.2 percent respectively when management provides such a safety measure. Similar findings have been reported by Fordjour (2015), Nyoh (2015) and others (Leiner, 2014; Mattis-Bernardo, 2009). Again, the chances of administrators experiencing eye pain, back pain, neck pain, numbness, wrist pain, shoulder pain, and headache after continuously using a computer for an hour or more decreases by 66.7 percent, 94 percent, 33.7 percent, 229.6 percent, 4.2 percent, 21.9 percent, and 0.5 percent respectively when management conducts annual computer use risk assessment compared to when they do not.

Moreover, given that management ensures that workstations are designed and set up to promote and protect the health and well-being of administrators, their probable risk of experiencing eye pain continuously using a computer decreases by 15.1 percent relative to when they do not. This finding supports the findings of Robertson, Ciriello and Garabet (2013). In a randomised control trial conducted by Robertson et al. they found that ergonomics training on computer safety practices significantly reduced the visual discomfort of participants. If management ensures that workstations are designed and set up to promote and protect the health and well-being of administrators, their probable risk of

experiencing back pain and neck pain after continuously using a computer decreases by 37.7 percent and 42.8 percent, respectively compared to when they do not. This finding is consistent with the findings of Rempel et al. (2006) who in a randomized control trial, found that workplace interventions on computer safety practices significantly reduced the neck and shoulder paints of beneficiaries.

Further, when management conducts medical screening of the eyes, waist, back, wrist etc. for administrators, their likelihood of experiencing eye pain, back pain, neck pain, numbness, wrist pain, shoulder pain, and headache after continuously using a computer for an hour or more decreases by 21.1 percent, 18.9 percent, 10.8 percent, 28.8 percent, 53.9 percent, 10.5 percent, and 21.9 percent respectively compared to when management does not put in place such a safety measure (Breivik et al., 2008; Sitaula & Khatri, 2018).

Still on safety and health measure, for administrators who received training on computer use safety practices, their likelihood of experiencing eye pain, back pain, neck pain, numbness, wrist pain, shoulder pain, and headache after continuously using a computer for an hour or more decreases by 9.1 percent, 65 percent, 99 percent, 21.7 percent, 56.4 percent, 42.1 percent, and 58 percent respectively compared to when management does not put in place such a safety measure. This finding supports the finding of Amick et al. (2003) and Robertson et al. (2013) who found that training interventions significantly reduce computer-associated health challenges. Regarding the effect of socio-demographics on health hazards, this study finds mixed results.

In terms of gender, while females are 25.5% and 0.7% more likely than males to experience eye pain and neck pain respectively, they are 90.7% and 75.6% less likely to experience back pain and numbness respectively compared to males. What this finding means is that a sociodemographic variable like gender

significantly influences health challenges associated with the use of computers. Similar, findings reported by Ajuwon and Popoola (2014) in Nigeria indicates that they also found gender to be significantly associated with health challenges associated with computer usage.

Regarding age, the study finds that individuals between 40 and 49 years are 71.1% and 4.4% more likely to experience eye pain and back pain respectively compared to those below 30 years. For education, the study finds that administrators with diploma qualifications are more likely to experience eye health challenges compare to their counterpart who had qualification that are below diploma. On the contrary, those with graduate degrees are less likely to experience health challenges like eye pain, back pain, and neck pain after using computer compared to those who have qualifications below diploma. The implication is that; education improves one's knowledge of how to use computers appropriately without experiencing severe health challenges. In a German study, Nölke, Mensing, Krämer and Hornberg (2015) found sociodemographic variables such as age and education to be significant predictors of health challenges associated with computer usage. However, Unegbu, Amaechi, Njoku and Opara (2015) found that age does not even influence computer usage in Nigeria.

For marital status, the study finds no signification relationship between marital status and health challenges associated with computer usage. This finding is in contrast with the findings of Nölke, Mensing, Krämer and Hornberg (2015) who discovered that married people do not only experience health challenges after computer use, they are also more likely to use computers. Senior staff administrators were 44.5% and 51.9% more likely to experience neck and shoulder pain compared to Senior Member administrators. However, Junior Administrative staff were at risk, at different level, of experience all the

computer-use health and safety challenges mentioned in the survey. Educational background also significantly influenced health challenges of administrators. The likelihood of administrators experiencing a computer-use health challenge decreased as educational level increased. Whereas administrators with Diploma and Graduate educational background had the likelihood of experiencing at least four health challenges, those who had attained Post Graduate qualifications had only 5.2% chance of experiencing wrist pain. Concerning years of computer usage, it was observed that the risk of experience a computer-use health and safety challenge deceases as the number of years increase. That is, administers who have used the computer for more than 6 years are less likely to experience a health challenge compared to who have worked with computer for less than 6 years.

The results also showed that, over the years, administrators who sat behind their computer for 3 to 4 and 5 to 6 hours were 35.5% and 52.2% respectively more likely to experience back pain compared to those who use the computer for work for less than 3 hours. This drops to 24.1% for administrators who use the computer for 7 to 8 hours for work. This could be interpreted that administrators in this category may be applying the standard operative procedures when using computers. Similarly, administrators who sat behind their computer for 3 to 4 had 71% chance of getting neck pain however, this reduces to 8% for those who use the computer for 5 to 6 hours.

This is in line with the literature and explains the computer-use health challenges experienced by respondents (Kuckelman et al., 2018; Maples-Keller et al., 2017; Parihar et al., 2016; Vos et al., 2018). Administrators from all the units or sections captured in the survey reported the likelihood of having headache after using the computer for work. However, those at CHILS and CENAD were at

more risk at 86.6% and 88.7 respectively.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS, RECOMMENDATION

The purpose of the study was to examine the effects of computer usage and associated factors on health and safety of administrators at UCC and establish the influence of socio-demographic factors in the occurrence of health and safety challenges among the workers. This chapter presents a summary of the main findings and their resultant conclusions, relevant recommendations as well as areas to be considered for further studies have been suggested.

## Summary

Computers are used in almost every part or office in a higher educational setting. Such areas include the Directorate of Human Resource, Directorate of Academic affairs, Directorate of Finance and Internal Audit, as well as general offices of academic departments (Krishnaveni & Meenakumari, 2010). Working with computers has helped administrators in higher education to work efficiently in performing administrative functions such as student admissions, examination results, transcripts, and records keeping such as human resource database (Kunda & Chama, 2016). However, even though the administrators work seems not to be laborious because they sit most of the time in performing their duties, the study has revealed that their jobs are very stressful and are more likely to experience work-life imbalance (Fevre, Boxall, & Macky, 2015). Administrators are also exposed to occupational injuries related to the use computers like Vision Syndrome which affects the eye, Carpal Tunnel Syndrome which affects the wrists and musculoskeletal disorders if computers are not rightly positioned, workstations are not in good conditions or not fit for the purpose (Korhan & Mackieh, 2010).

The study aimed at examining the effects of the use of computers and associated factors on health and safety of administrators in UCC and establishes the influence of socio-demographic factors in the occurrence of health and safety challenges among the workers. To address the specific objectives of the study, five research questions were formulated and used to retrieve information through a research instrument. The study adopted a quantitative approach to enable the researcher generate knowledge and create understanding about computer usage and associated health issues that come with it. Based on the research approach and the purpose of the study, a correlational design was adopted, specifically non-experimental research in which the researcher measures two constructs and assesses the statistical relationship between them with little or no effort to control extraneous variables. The research focused on the main campus of the University in Cape Coast. The census sampling was used to collect data from 828 administrators through a questionnaire in the various sections of the University. However, only 281 administrators responded. While SPSS was used for data coding and entry, STATA was used for data cleaning, management and analysis.

**Main Findings**

The main findings are summarized as follows:

1. It was revealed that majority of the employees (94.66% of administrators) are much aware that there are health hazards associated with the use of computers. However, more than half of them do not know the basic standard operating procedures regarding computer usage.
2. Again, most administrators faced computer associated health challenges mainly back pain (72.24%), neck pain (67.26) and vision problems (62.63) which were the leading challenges. Nevertheless, just below 50% had headaches and wrist pain whereas 34.88% of the administrators

experienced numbness in their legs. Females are more likely to experience eye and neck pains after using computers relative to males. However, females are less likely to experience back pain and numbness relative to males.

3. Generally, administrators of UCC were of the view that management provides protective computer accessories such as screen protectors for their use. On the average, they also said that management conducts annual computer use risk assessment to ensures that workstations are designed and set-up in a way that promotes and protects their health and well-being. However, based on the health problems recorded in the study this is not a reflection.
4. It was revealed that even though most administrators know that there are possible health and safety regarding computer use, they lacked knowledge of basic SOPs or precautions to follow when using computers. Therefore, in relation to safety provisions made available by management, because most administrators had inadequate knowledge on SOPs, safety provisions could not be translated into practice.
5. Finally, the study discovered that while sociodemographic variables like gender, education, and years of work experience significantly determines the health challenges experienced by administrators at UCC, other variables like type of college, and marital status do not significantly influence health challenges associated with computer usage.

**Conclusions**

The following conclusions are drawn from the above key findings.

Socio-demographic factors such as gender, level of education, designation, and years of experience in using computers all play a role in shaping the health and

safety challenges faced by administrators. This highlights the need for tailored interventions that consider these factors to enhance the well-being of all administrators at UCC. Also, administrators have some level of education or training regarding their work ethics which enables them to determine and exhibit such level of awareness. However, they lacked knowledge of basic SOPs or precautions to follow when using computers even though they are aware of possible health and safety hazards regarding computer use.

Although some safety measures are provided by management for administrators in relation to the use of computers for their work, there remains room for improvement in enduring that they are fully equipped with knowledge to implement these practices effectively. The prevalence of health issues such as back pain, neck pain, and vision problems underscores the importance of addressing these concerns through better awareness and education on proper ergonomic practices. Also, the positive relationship between administrators' knowledge of health hazards and their adherence to safety practices suggests that improving knowledge could lead to better safety outcomes

It can be concluded that health effects of using computers as a tool to facilitate work rest on the notion that accidents have rippling effects and that when knowledge about hazard or cause and effect is high, and health and safety measure are made available, impact of health effects related to computer usage will be minimal.

**Recommendations**

Based on the findings and conclusions drawn, the following recommendations are made:

1. It is recommended that management should continue educating and training administrators about the health hazards associated with computer

usage and SOPs. Engagement of resource persons in OHS so that awareness will translate into knowledge and practice to alleviate and eradicate computer-use health effects. This will move the administrator from just being aware of the existence of hazards to knowing what they are to help them make informed decisions and take appropriate measures when using their computers for work.

2. Administrators should be encouraged to report accidents and injuries relating to the usage of computer at the health centre on time. Supervisors or heads of units must also act promptly when ergonomic issues are reported.
3. Proper channels for reporting accidents and injuries for administrators should be established and personnel in charge should be required to produce periodical reports to help in addressing occupational health and safety issues.
4. It is also recommended that Management should add eye test and physiotherapy (including massage) section to the already existing routine annual medical check-up for staff, especially administrators to ease musculoskeletal disorders being experienced and prevent them from escalating into chronic conditions.

**Suggestions for Further Studies**

To further extend the research on assessing the impact of the use of computers and associated factors on health and safety of administrators in UCC, and establish the influence of socio-demographic factors in the occurrence of health and safety challenges among the workers, the following recommendations are provided for further studies:

1. The study was done in only one university therefore, similar studies should be conducted in other universities in other regions or across the country to compare results and make a case for generalisation.
2. Future study can be done between private and public universities. This is to ascertain which sectors of administrators working in higher educational settings are well protected regarding. That is, in terms of well laid down standard operating procedures, available and effective injury reporting and follow up systems.
3. Also, a review of any national policy on health and safety for administrators, where it exists, can be done emphasising on the legal implications of non-provision and non-compliance of health and safety measures of both employers and employees.
4. The study should also be replicated and extended to different subject areas or disciplines such as lectures who also use computers to prepare lecture notes, record student grades and do research as part of continuous professional development.
5. A checklist can be developed and employed in further studies for office risk assessment for all computer users in the institution.

## REFERENCES

Abudayyeh, O., Fredericks, T. K., Butt, S. E., & Shaar, A. (2006). An investigation of management's commitment to construction safety. *International Journal of Project Management, 24*(2), 167-174.

Adam, I. O., Effah, J., & Boateng, R. (2017). Virtualisation of an administrative work environment in higher education: Managing information in a developing country university. *Journal of Enterprise Information Management, 30*(5), 723-747.

Adeniyi, Sofola, O., & Asiyanbi, O. (2018). Effect of health education intervention conducted by primary health care workers on oral health knowledge and practices of nursing mothers in Lagos state. *Journal of Public Health in Africa, 9*(2), 833.

Adhikary, P., Keen, S., & Van Teijlingen, E. (2019). Workplace accidents among Nepali male workers in the Middle East and Malaysia: A qualitative study. *Journal of Immigrant and M0inority Health, 21*(5), 1115-1122.

Admin. (2021). *Theoretical principles of job safety. Safety engineering.* Retrieved from https://safetyengineering.softecks.in/501/.

Agbo, I. S. (2015). Factors influencing the use of information and communication technology (ICT) in teaching and learning computer studies in Ohaukwu local government area of Ebonyi state-Nigeria. *Journal of Education and Practice, 6*(7), 71-86.

Agrawal, S., & Rajajeyakumar, M. (2018). Early diagnosis and prevention of repetitive strain injury induced carpal tunnel syndrome among computer users. *Clin Exp Psychol, 4,* 188.

Ahmed, D. J., & Alwan, E. H. (2018). Prevalence of computer vision syndrome in Erbil. *Zanco Journal of Medical Sciences, 22*(1), 115-119.

Ai, L. T. E., Yean Y. L. F., & Sern, Y. O. D. (2005). Fostering safe work behaviour in workers at construction sites. *Engineering, Construction and Architectural Management, 12*(4), 410-422.

Ajah, I. A., & Chigozie-Okwum, C. C. (2019). ICT and administrative effectiveness of University in Nigeria: A connect between leadership and knowledge. *An International Journal of Science and Technology, 8*(2), 64-85.

Ajuwon, G. A., & Popoola, S. O. (2014). Influence of internet accessibility and demographic factors on utilisation of web-based health information resources by resident doctors in Nigeria. *African Journal of Medicine and Medical Sciences, 43*(Suppl 1), 61.

Akers, R. L., & Jensen, G. F. (2017). *The empirical status of social learning theory of crime and deviance: The past, present, and future.* In Taking stock (pp. 37-76). Routledge.

Akinbinu, T. R., & Mashalla, Y. J. (2014). Impact of computer technology on health: Computer Vision Syndrome (CVS). *Medical Practice and Review, 5*(3), 20-23.

Aksorn, T., & Hadikusumo, B. H. W. (2008). Critical success factors influencing safety program performance in Thai construction projects. *Safety Science, 46*(4), 709-727.

Alfers, L. (2009). *Occupational health & safety for market and street traders in Accra and Takoradi, Ghana. Manchester: Women in informal employment: Globalising and organising.* Available at: Alfers_OHS_ Street_Traders_2009. pdf (wiego. org) (accessed 1 October 2021).

Alli, B. O. (2008). *Fundamental principles of occupational health and safety.* Geneva, International Labour Organisation, 15.

Alsamawi, A., Murray, J., Lenzen, M., & Reyes, R. C. (2017). Trade in occupational safety and health: Tracing the embodied human and economic harm in labour along the global supply chain. *Journal of Cleaner Production, 147,* 187-196.

Alshagga, M. A., Nimer, A. R., Yan, L. P., Ibrahim, I. A. A., Al-Ghamdi, S. S., & Al-Dubai, S. A. R. (2013). Prevalence and factors associated with neck, shoulder and low back pains among medical students in a Malaysian Medical College. *BMC Research Notes, 6*(1), 1-7.

Amick III, B. C., Robertson, M. M., DeRango, K., Bazzani, L., Moore, A., Rooney, T., & Harrist, R. (2003). Effect of office ergonomics intervention on reducing musculoskeletal symptoms. *Spine, 28*(24), 2706-2711.

Anderson, D. L. (2019). *Organisation development: The process of leading organisational change.* Sage Publications.

Anku-Tsede, O. (2016). Occupational health and safety practices and the regulatory regime: Evidence from the infantile oil fields of Ghana. In advances in safety management and human factors: Proceedings of the AHFE 2016 International Conference on Safety Management and Human Factors, July 27-31, 2016, Walt Disney World®, Florida, USA (pp. 75-88). Springer International Publishing.

Annan, J. S., Addai, E. K., & Tulashie, S. K. (2015). A call for action to improve occupational health and safety in Ghana and a critical look at the existing legal requirement and legislation. *Safety and health at work, 6*(2), 146-150.

Anya, J., Nguyen, H., Groth, M., & White, L. (2018). Workplace aggression and organisational effectiveness: The mediating role of employee engagement. *Australian Journal of Management, 43*(4), 614-631.

Arghish, O., Tavakkoli-Moghaddam, & Rezaeian, J. (2018). Comparison among four calibrated meta-heuristic algorithms for solving a type-2 fuzzy cell formation problem considering economic and environmental criteria. *Advances in Production Engineering & Management, 13*(1), 5-17.

Ashwini, M. (2010). Prevalence of repetitive strain injury, visual disorders and stress among information technology professionals in Bangalore city (Doctoral dissertation, Rajiv Gandhi University of Health Sciences (India). Retrieved from: https://www.proquest.com/openview/5527c58fac9f63085e2c45ca6f96688d/1?cbl=2026366&diss=y&pq-origiste=gscholar.

Attia, Z., Fouad, F., & Radwan, S. (2019). Training program for prevention of workstation ergonomically back disorders among computer operators. *Egyptian Journal of Health Care, 10*(2), 154-165.

Avwata, H. I., Oyegun, U. C., & Ugbebor, N. J. (2021). Analysis of incident characteristics of selected oil and gas operations in Niger Delta. *International Journal of Research and Innovation in Applied Science, 6*(6), 138-144.

Bacchetta, M., & Bustamante, J. P. (2009). *Globalisation and informal jobs in developing countries: A joint study of the international labour office and the secretariat of the world trade organisation*. Retrieved from https://doi.org/10.30875/f801556b-en

Bacow, L. (1982). Bargaining for job safety and health. MIT Press Books, 1.

Baldwin, J. T. (2017). Fundamentals of stability theory (Vol. 12). Cambridge University Press.

Basakci C. B., Yagci, N., Oztop, M., & Caglar, D. (2020). Effects of risk factors related to computer use on musculoskeletal pain in office workers. *International Journal of Occupational Safety and Ergonomics*, *28*(1), 269–274.

Beard, R. W., McLain, T. W., & Goodrich, M. (2002, May). Coordinated target assignment and intercept for unmanned air vehicles. In *proceedings 2002 IEEE international conference on robotics and automation. 18*(6), 911–922.

Bennett, R. N., Mellon, F. A., Foidl, N., Pratt, J. H., Dupont, M. S., Perkins, L., & Kroon, P. A. (2003). Profiling glucosinolates and phenolics in vegetative and reproductive tissues of the multi-purpose trees Moringa oleifera L (Horseradish tree) and Moringa stenopetala L. *Journal of Agricultural and Food Chemistry*, *51*(12), 3546-3553.

Bentil, R. A. (2018). Occupational health and safety knowledge and practices of workers in the AngloGold Ashanti Iduapriem gold mine Ghana limited, Tarkwa (Doctoral dissertation, University of Cape Coast). Retrieved from https://ir.ucc.edu.gh/xmlui/bitstream/handle/123456789/3329/BENTIL%202018.pdf?sequence=1&isAllowed=y.

Bernardo, A. M. (2009). The impact of the occupational safety and health administration on workplace safety in the United States. (Doctoral dissertation, Indiana University of Pennsylvenia). Retrieved from https://www.proquest.com/openview/522c66832ac120f7ab87b8c3746e9aeb/1?cbl=18750&pq-origsite=gscholar.

Blumenberg, C., Wehrmeister, F. C., Barros, F. C., Flesch, B. D., Guimarães, F., Valério, I., ... & Menezes, A. M. B. (2021). Association of the length of time using computers and mobile devices with low back, neck and mid-back pains: findings from a birth cohort. *Public Health, 195*, 1-6.

Boettke, P. J., & Candela, R. A. (2017). Rational choice as if the choosers were human. *Handbook of behavioural economics and smart decision-making*: Rational decision-making within the bounds of reason (pp. 68–85). Edward Elgar Publishing.

Bosu, R. S. (2008). Utilisation of computer technology in public universities in Ghana: Implications for management: Utilisation of computer technology in public universities in Ghana: Implications for management. *Journal of Educational Management, 5,* 1-13.

Bosu, R. S. (2019). The role and use of ICT in administrative activities in higher education institutions: The views of administrators in higher educational institutions in Ghana. *International Journal of Innovative Research & Development,* 8, 12.

Breivik, H., Borchgrevink, P. C., Allen, S. M., Rosseland, L. A., Romundstad, L., Breivik, H. E. K., ... & Stubhaug, A. (2008). Assessment of pain. *British Journal of Anaesthesia, 101*(1), 17-24.

Brizga, D., Peks, L., & Bertaitis, I. (2013). Computer use impact on students' health in the context of ecological approach to occupational safety. In *Proceedings 12th International Scientific Conference" Engineering for Rural Development (pp. 598-602).*

Bryman, A., & Cramer, D. (2009). *Quantitative data analysis with SPSS 14, 15 & 16: A guide for social scientists.* Routledge/Taylor & Francis Group.

Burton, R., Obel, B., & Haakonsson, D. (2015). How to get the matrix organization to work. *Journal of Organization Design JOD, 4*(3), 37-45.

Bust, P. D. (Ed.). (2008). *Contemporary Ergonomics 2008: Proceedings of the International Conference on Contemporary Ergonomics (CE2008), 1-3 April 2008.* Nottingham, UK. CRC Press.

Cagnie, B., Danneels, L., Van Tiggelen, D., De Loose, V., & Cambier, D. (2007). Individual and work-related risk factors for neck pain among office workers: a cross-sectional study. *European Spine Journal, 16*, 679-686.

Cascio, A., Bosilkovski, M., Rodriguez-Morales, A. J., & Pappas, G. (2011). The socio-ecology of zoonotic infections. *Clinical Microbiology and Infection, 17*(3), 336-342.

Check, J., & Schutt, R. K. (2011). *Research methods in education*. Sage publications.

Chen, D. D., Chen, M. S., & Wen, D. X. (2017). Dislocation substructures evolution and an adaptive-network-based fuzzy inference system model for constitutive behavior of a Ni-based superalloy during hot deformation. *Journal of Alloys and Compounds, 708*, 938-946.

Cheung, T. W., Clemson, L., O'Loughlin, K., & Shuttleworth, R. (2018). Ergonomic education on housework for women with upper limb repetitive strain injury (RSI): A conceptual representation of therapists' clinical reasoning. *Disability and Rehabilitation, 40*(26), 3136-3146.

Cloud, D. (2018). Toward a richer rhetoric of agency: Shaping the identity category transgender in public discourse. *Argumentation and Advocacy, 54*(3), 161-178.

Corin, L. (2016). Job demands and job resources in human service managerial work an external assessment through work content analysis. *Old Site of Nordic Journal of Working Life Studies, 6*(4), 3-28.

Cudjoe, S. F. (2011). An assessment of occupational health and safety practices on job performance at the Tetteh Quarshie Memorial Hospital, Mampong-Akuapem (Doctoral dissertation). Retrieved from https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=b03575da003010b46c46c0f2453cbf90f92f2f26.

De Haas, H., Castles, S., & Miller, M. J. (2019). *The age of migration: International population movements in the modern world*. Bloomsbury Publishing.

Dessie, A., Adane, F., & Chercos, D. H. (2018). Computer vision syndrome and associated factors among computer users in Debre Tabor Town, Northwest Ethiopia. *Journal of Environmental and Public Health, 2018*(1), 4107590.

De Stefano, V. M. (2016). The rise of the 'just-in-time workforce': on-demand work, crowd work and labour protection in the 'gig-economy'. *Comparative labor law and policy journal, 37*(3), 471-504.

Diepenmaat, A. C. M., Van der Wal, M. F., De Vet, H. C. W., & Hirasing, R. A. (2006). Neck/shoulder, low back, and arm pain in relation to computer use, physical activity, stress, and depression among Dutch adolescents. *Paediatrics, 117*(2), 412-416.

Dighriri, Y. H., Akkur, M. A., Alharbi, S. A., Madkhali, N. A., Matabi, K. I., & Mahfouz, M. S. (2019). Prevalence and associated factors of neck, shoulder, and low-back pains among medical students at Jazan University, Saudi Arabia: A cross-sectional study. *Journal of family Medicine and Primary Care, 8*(12), 3826.

Domínguez, C. R., Guadian, J. E. R., Lona, J. G., & Mares, J. I. P. (2023). Hazard identification for risk assessment using the PRA technique in the automotive industry. *Safety Science*, 160, 106041.

Donkor, D. (2012). Evaluation of health and safety practices and policies at Electricity Company of Ghana, the case of the Ashanti East Region (Doctoral dissertation, Kwame Nkrumah University of Science and Technology, Ghana). Retrieved from https://citeseerx.ist.psu.edu /document?repid=rep1&type=pdf&doi=87d0e5ff0be64ced182e6d942822825929d18aee

Douven, I. (2018). A Bayesian perspective on Likert scales and central tendency. *Psychonomic Bulletin & Review*, *25*, 1203-1211.

Ellahi, A., Khalil, M. S., & Akram, F. (2011). Computer users at risk: Health disorders associated with prolonged computer use. *Journal of Business Management and Economics*, *2*(4), 171-182.

Fang, X. S., Ye, C. H., Xu, X. X., Xie, T., Wu, Y. C., & Zhang, L. D. (2004). Synthesis and photoluminescence of α-Al2O3 nanowires. *Journal of Physics: Condensed Matter, 16* (23), 4157.

Fernandes, P., Rashmi, S., Benny, B., Peter, C. S., & Sagna, P. S. (2019). Self-reported practice of ergonomics and musculoskeletal problems among computer users of selected offices at Mangaluru. *Manipal Journal of Nursing and Health Sciences*, *5*(1), 12-15.

Ferrell, O., Gresham, L. G., & Fraedrich, J. (1989). A synthesis of ethical decision models for marketing. *Journal of Macromarketing*, *9*(2), 55-64.

Fiems, R. A., & Hertig, C. A. (2001). Protection office guidebook. International Foundation for Protection Officers, Naples, FL.

Firenze, R. J. (1978). *The process of hazard control*. Kendall Hunt Publishing Company.

Florance, A., Elston, R., Johnson, M., Spreen, W., & St Clair, M. (2004). Phenotypic and genotypic resistance to a new protease inhibitor, 640385, in HIV-1 virus samples from subjects failing amprenavir. In Antiviral Therapy (Vol. 9, No. 4, pp. U28-U28). 2-4 IDOL Lane, London EC3R 5DD, England: Int Medical Press Ltd.

Fong, K., Falardeau, J., Rideout, K., Wilcott, L., Fong, D., & Wang, S. (2017). Opinions of provincial food safety specialists on addressing Canadian beef processing risks. *Food Protection Trends*, *37*(5), 316-331.

Fordjour, G. A. (2015). Factors inhibiting the implementation of occupational health and safety in the Ghanaian Construction Industry (Doctoral dissertation, Kwame Nkrumah University of Science and Technology, Ghana). Retrieved from https://ir.knust.edu.gh/items/a0d15f6a-13c1-4e02-9e2d-ef7e53b94356.

Forsberg, N. (2019). From self-reliance to that which relies: Emerson and critique as self-criticism. *Educational Philosophy and Theory*, *51*(5), 498-507.

Fraenkel, J. R., Wallen, N., & Hyun, H. H. (1993). Research methods. *How to design and evaluate research in education.*

Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerization? *Technological Forecasting and Social Change, 114*, 254-280.

Fuglseth, A. M., & Sørebø, Ø. (2014). The effects of technostress within the context of employee use of ICT. *Computers in Human Behavior, 40*, 161-170.

Gaba, D. M. (2018). 11 Human error in dynamic medical domains. *Human Error in Medicine*, 59.

Gambatese, J. A. (2015). Perceptions about design for construction worker safety: Viewpoints from contractors, designers, and university facility owners. *Journal of Construction Engineering and Management*, *142*(2), 04015078.

Ganson, G. A. (2014). Assessing the effectiveness of health and safety practices at Anglogold Ashanti Company, Obuasi Mine (Doctoral dissertation, Kwame Nkrumah University of Science and Technology, Ghana). Retrieved from https://ir.knust.edu.gh/items/d2018abb-c45e-45d4-ae41-8a69b6835804.

Geller, E. S. (2009, June). Cultivating an actively-caring culture: Dispelling myths about people and moving forward. In *ASSE Professional Development Conference and Exposition* (pp. ASSE-09). ASSE.

Ghasemi, F., Kalatpour, O., Moghimbeigi, A., & Mohammadfam, I. (2017). Selecting strategies to reduce high-risk unsafe work behaviours using the safety behavior sampling technique and Bayesian network analysis. *Journal of Research in Health Science*, *17*(1), 372.

Gillen, M., Baltz, D., Gassel, M., Kirsch, L., & Vaccaro, D. (2002). Perceived safety climate, job demands, and coworker support among union and nonunion injured construction workers. *Journal of Safety Research*, *33*(1), 33-51.

Goldstein, J. H. (2013). Technology and play. *Scholarpedia*, *8*(2), 30434.

Grant, E., Salmon, P. M., Stevens, N. J., Goode, N., & Read, G. J. (2018). Back to the future: What do accident causation models tell us about accident prediction? *Safety Science*, *104*, 99-109.

Green, B. N. (2008). A literature review of neck pain associated with computer use: Public health implications. *The Journal of the Canadian Chiropractic Association*, *52*(3), 161.

Greenwald, M. J., Greenwald, S. L., & Blake, R. (1983). Long-lasting visual aftereffect from viewing a computer video display. *The New England Journal of Medicine*, *309*(5), 315-315.

Gregg, J. R. (1972). *American Optometric Association: A history*. American Optometric Association.

Guest, C. (2019). Advantages and disadvantages of census surveys. *Journal of Business Statistics*, *23*(5), 91-95.

Guldenmund, F. W. (2010). Understanding and exploring safety culture. Oisterwijk: BOXPress.

Gunduz, D., & Erkip, E. (2007). Opportunistic cooperation by dynamic resource allocation. *IEEE Transactions on Wireless Communications*, *6*(4), 1446-1454.

Gyekye, S. A, & Salminen, S. (2007). Workplace safety perceptions and perceived organisational support: Do supportive perceptions influence safety perceptions? *International Journal of Occupational Safety and Ergonomics*, *13*(2), 189-200.

Gyeltshen, C., & Beri, N. (2018). Work Motivation on an Employability Tool for Teachers. *International Journal of Innovative Knowledge Concepts*, *6*, 11.

Halkos, G., & Bousinakis, D. (2010). The effect of stress and satisfaction on productivity. *International Journal of Productivity and Performance Management*, *59*(5), 415-431.

Hamilton, A., Foster, C., Richards, J., & Surenthirakumaran, R. (2016). Psychosocial wellbeing and physical health among Tamil school children in northern Sri Lanka. *Conflict and Health, 10*(1), 13.

Hare, B. (2006). "Integration of health and safety planning in construction project management through the development of a best practice 'Gateway' model". PhD thesis, School of the Built & Natural Environment, Glasgow Caledonian University.

Hargreaves, S., Rustage, K., Nellums, L. B., McAlpine, A., Pocock, N., Devakumar, D., ... & Zimmerman, C. (2019). Occupational health outcomes among international migrant workers: a systematic review and meta-analysis. *The Lancet Global Health, 7*(7), e872-e882.

Hatch, E. M., & Lazaraton, A. (1991). The research manual: Design and statistics for applied linguistics. New York, NY: Newbury House Publishers.

Heinrich, H. W., Petersen, D., & Ross, N. (1980). Principles of accident prevention. *Industrial Accident Prevention*, 20-91.

Herzberg, F. M., & Mausner, B., & Snyderman, B. (1959). *The motivation to work*, 2, 49-58.

Heylighen, F. (1992). A cognitive-systemic reconstruction of Maslow's theory of self-actualisation. *Behavioral Science, 37*(1), 39-58.

Hilbe, J. M. (2009). *Logistic regression models*. Chapman and hall/CRC.

Hinze, J., & Gambatese, J. (2003). Factors that influence safety performance of specialty contractors. *Journal of Construction Engineering and Management, 129*(2), 159-164.

Hinze, M., & Matthes, U. (2009). A note on variational discretisation of elliptic Neumann boundary control. *Control and Cybernetics*, *38*(3), 577-591.

Horseman, S. J. (2018). *U.S. Patent No. 10,108,783*. Washington, DC: U.S. Patent and Trademark Office.

Hulme, A., Stanton, N. A., Walker & Salmon, P. M. (2019). What do applications of systems thinking accident analysis methods tell us about accident causation? A systematic review of applications between 1990 and 2018. *Safety Science, 117*, 164-183.

Hulshof, C. T., Pega, F., Neupane, S., van der Molen, H. F., Colosio, C., Daams, J. G., ... & Frings-Dresen, M. H. (2021). The prevalence of occupational exposure to ergonomic risk factors: A systematic review and meta-analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury. *Environment international, 146*, 106157.

Ibrahim, F. (2018). Assessment of knowledge of occupational health hazards and safety practices among radiographers in the Greater Accra Region, Ghana (Doctoral dissertation, University of Ghana).

International labour organisation. Forestry, wood industries committee, & International labour organisation. Sectoral activities programme. (2011). Occupational safety and health in forestry (Vol. 2). International Labour Organisation.

International labour organization (2011). Theoretical principles of job safety. Encyclopaedia of occupational health & safety. Retrieved from https://www.iloencyclopaedia.org/part-viii-12633/accident-prevention/item/902-theoretical-principles-of-job-safety.

Ivancevich, J. M. (2015). *Human resource management-11*. Aufl. Boston, MA.

Ivancevich, J. M., & Ganster, D. C. (2014). *Job stress: From theory to suggestion*. Routledge.

Iyadurai, L., Blackwell, Geddes, J. R., ... & Holmes, E. A. (2018). Preventing intrusive memories after trauma via a brief intervention involving Tetris computer game play in the emergency department: A proof-of-concept randomized controlled trial. *Molecular Psychiatry, 23*(3), 674-682.

Jasanoff, S. (2016). *The ethics of invention: Technology and the human future.* WW Norton & Company.

Jimison, H. B., & Pavel, M. (2024). The role of human computer interaction in consumer health applications: current state, challenges and future. In *Human Computer Interaction in Healthcare: The Role of Cognition* (pp. 391-411). Cham: Springer Nature Switzerland.

Johansson, P. (2015). What you can do about carpal tunnel syndrome and other repetitive strain injuries. Enslow Publishing, LLC

Jones-Berry, S. (2018). Lone workers need employers to act over dangers they face. *Nursing Standard (2014+), 32*(29), 12.

Kagan, S., Byrne, M., & Leighton, M. (2017). Organisational perspective from the International labour organisation. In *Research handbook on climate change, migration and the law*. Edward Elgar Publishing.

Kasap, F., & Acar, H. H. (2018). Developing an inspection system between the main employer and the sub-employers in terms of occupational health and safety: A case study. *European Journal of Forest Engineering, 5*(1), 36-46.

Kasperson, R. E. (2019). Corporate management of health and safety hazards: a comparison of current practice. Routledge.

Kaye, D. (1982). The limits of the preponderance of the evidence standard: Justifiably naked statistical evidence and multiple causation. *Law & Social Inquiry, 7*(2), 487-516.

Khan, R., Surti, A., Rehman, R., & Ali, U. (2012). Knowledge and practices of ergonomics in computer users. *JPMA-Journal of the Pakistan Medical Association*, *62*(3), 213.

Kheni, N. A., Gibb, A. G., & Dainty, A. R. (2010). Health and safety management within small-and medium-sized enterprises (SMEs) in developing countries: Study of contextual influences. *Journal of Construction Engineering and Management*, *136*(10), 1104-1115.

Khorasani, J., Tavafian, S. S., & Zarei, F. (2018). Status of musculoskeletal pains and disorders among computer users. *International Journal of Musculoskeletal Pain Prevention*, *3*(3), 83-86.

Kim, Y., Park, J., & Park, M. (2016). Creating a culture of prevention in occupational safety and health practice. *Safety and Health at Work*, *7*(2), 89-96.

Korhan, O., & Mackieh, A. (2010). A model for occupational injury risk assessment of musculoskeletal discomfort and their frequencies in computer users. *Safety Science*, *48*(7), 868-877.

Krishnaveni, R., & Meenakumari, J. (2010). Usage of ICT for information administration in higher education institutions–A study. *International Journal of Environmental Science and Development*, *1*(3), 282-286.

Krosnick, J. A. (2018). Questionnaire design. *The Palgrave handbook of survey research*, 439-455.

Kuckelman, J. P., Barron, M., Moe, D., Derickson, M., Phillips, C., Kononchik, J., ... & Martin, M. J. (2018). Extending the golden hour for Zone 1 resuscitative endovascular balloon occlusion of the aorta: Improved survival and reperfusion injury with intermittent versus continuous resuscitative endovascular balloon occlusion of the aorta in a porcine

severe truncal hemorrhage model. *Journal of Trauma and Acute Care Surgery, 85*(2), 318-326.

Kunda, D., & Chama, V. (2016). Design and implementation of students' information system (SIS) for Mulungushi University based on spring framework. *International Journal of Computer and Information Technology 5*(6), 556-562.

LeBlanc, A. G., Gunnell, Barnes, J. D., & Chaput, J. P. (2017). The ubiquity of the screen: an overview of the risks and benefits of screen time in our modern world. *Translational Journal of the American College of Sports Medicine, 2*(17), 104-113.

Le Fevre, M., Boxall, P., & Macky, K. (2015). Which workers are more vulnerable to work intensification? An analysis of two national surveys. *International Journal of Manpower, 36*(6), 966-983.

Lee, J. (1995). Machine performance monitoring and proactive maintenance in computer-integrated manufacturing: Review and perspective. *International Journal of Computer Integrated Manufacturing, 8*(5), 370-380.

Le Fevre, M., Boxall, P., & Macky, K. (2015). Which workers are more vulnerable to work intensification? An analysis of two national surveys. *International Journal of Manpower, 36*(6), 966-983.

Leiner, M., Palme, M., Stöckner, P., Bourgine, B., Dermange, F., Doyle, D., ... & Tombs, D. (Eds.). (2014*). Societies in transition: sub-Saharan Africa between conflict and reconciliation*. Vandenhoeck & Ruprecht.

Leveson, N. (2004). A new accident model for engineering safer systems. *Safety Science, 42*(4), 237-270.

Leveson, N. (2011). *Engineering a safer world: Systems thinking applied to safety*. MIT press.

Leveson, N., Dulac, N., Marais, K., & Carroll, J. (2009). Moving beyond normal accidents and high reliability organisations: A systems approach to safety in complex systems. *Organization Studies, 30*(2-3), 227-249.

Li, R. Y. M., Chau, K. W., Lu, W., Ho, D. C. W., Shoaib, M., & Meng, L. (2019). Construction hazard awareness and construction safety knowledge sharing epistemology. In *International Conference on Smart Infrastructure and Construction 2019 (ICSIC) Driving data-informed decision-making* (pp. 283-290). ICE Publishing.

Lingard, H. C., & Rowlinson, S. M. (2010). The Hong Kong Housing Authority accident information system: The first sixteen months. In *Proceedings of Rinker Conference on Construction Site Safety*.

Lingard, L., Reznick, R., Espin, S., Regehr, G., & DeVito, I. (2002). Team communications in the operating room: Talk patterns, sites of tension, and implications for novices. *Academic Medicine, 7* (3), 232-237.

Lockwood, M. (1999). A doubling of the Sun's coronal magnetic field during the past 100 years. *Nature*, *399*(6735), 437.

Mackey, A., & Gass, S. (2005). *Second language research: Methodology and design.* Mahwah, NJ: Lawrence Erlbaum.

Maitland, E., & Sammartino, A. (2015). Decision making and uncertainty: The role of heuristics and experience in assessing a politically hazardous environment. *Strategic Management Journal, 36*(10), 1554-1578.

Maples-Keller, J. L., Bunnell J., & Rothbaum, B. O. (2017). The use of virtual reality technology in the treatment of anxiety and other psychiatric disorders. *Harvard Review of Psychiatry, 25*(3), 103.

Mariscal, M. A., López-Perea, E. M., López-García, J. R., Herrera, S., & Garcia-Herrero, S. (2019). The influence of employee training and information on the probability of accident rates. *International Journal of Industrial Ergonomics, 72*, 311-319.

McConnell, B. (2001). *Beyond contact: A guide to SETI and communicating with alien civilizations.* " O'Reilly Media, Inc.".

Meyers, A. R., Al-Tarawneh, I. S., Bushnell. & Morrison, C. A. (2019). Degree of integration between occupational safety and health programs and wellness programs: First-year results from an insurer-sponsored wellness grant for smaller employers. *Journal of Occupational and Environmental Medicine*, *61*(9), 704-717.

Milkovich, G.T. & Boudreau, J. W. (2011). *Human resource management*. Irwin/McGraw-Hill, Burr Ridge, IL.

Miller, G. D., Rogers, C., Park, F. J., Owen, W. F., & Meiser, J. W. (2017). On strategy as ends, ways, and means. *Parameters, 47*(1).

Ming, Z., Närhi, M., & Siivola, J. (2004). Neck and shoulder pain related to computer use. *Pathophysiology, 11*(1), 51-56.

Mitchell, R., Myles, F., & Marsden, E. (2019). *Second language learning theories*. Routledge.

Mohammadfam, I., Ghasemi, F., Kalatpour, O., & Moghimbeigi, A. (2017). Constructing a Bayesian network model for improving safety behaviour of employees at workplaces. *Applied Ergonomics, 58*, 35-47.

Morgenthau, H. J. (2018). The fallacy of thinking conventionally about nuclear weapons. In *Arms Control and Disarmament* (pp. 79-89). Palgrave Macmillan, Cham.

Mullan, K. (2018). Technology and children's screen-based activities in the UK: The story of the millennium so far. *Child Indicators Research, 11*(6), 1781-1800.

Mustapha, Z., Aigbavboa, C., & Thwala, D. (2017, June). Basic Concepts in Structural Equation Modelling with Equations: A Survey of Health and Safety Compliance Elements. In *Joint CIB W099 & TG59 International Safety, Health, and People in Construction Conference* (p. 353).

Namwongsa, S., Puntumetakul, R., Neubert, M. S., & Boucaut, R. (2018). Factors associated with neck disorders among university student smartphone users. *Work*, *61*(3), 367-378.

Nana-Otoo, A. (2016). Occupational health and safety issues in the informal manufacturing sector of Cape Coast metropolis (Doctoral dissertation, University of Cape Coast). Retrieved from https://ir.ucc.edu.gh/xmlui /handle/123456789/3033.

Ndjoulou, F., Desmarais, L., & Pérusse, M. (2015). Employer Responsibility for Occupational Health and Safety: Challenges, Issues and Approaches. *Journal of Management*, *3*(1), 1-8.

Nölke, L., Mensing, M., Krämer, A., & Hornberg, C. (2015). Sociodemographic and health-(care-) related characteristics of online health information seekers: A cross-sectional German study. *BMC Public Health*, *15*(1), 1-12.

Nuñez, I., & Villanueva, M. (2011). Safety capital: the management of organizational knowledge on occupational health and safety. *Journal of Workplace Learning*, *23*(1), 56-71.

Nyoh, V. W. C. (2015). The effect of occupational health and safety on job performance (Productivity) of employees of lue Skies Ghana Limited (Doctoral dissertation, University of Ghana). Retrieved from http://ugspace. ug. edu. Gh.

O'Connor, T., Loomis, D., Runyan, C., dal Santo, J. A., & Schulman, M. (2005). Adequacy of health and safety training among young Latino construction workers. *Journal of occupational and environmental medicine*, 272-277.

Omari, R., Frempong, G. K., & Arthur, W. (2018). Public perceptions and worry about food safety hazards and risks in Ghana. *Food Control, 93*, 76-82.

Orantes-Jimenez, S. D., Zavala-Galindo, A., & Vazquez-Alvarez, G. (2015). Paperless office: A new proposal for organisations. *Systemics, Cybernetics and Informatics, 13*(3), 47-55.

Örün, Ö., & Akbulut, Y. (2019). Effect of multitasking, physical environment and electroencephalography use on cognitive load and retention. *Computers in Human Behaviour, 92*, 216-229.

Osuala, E. C. (2001). *Introduction to research methodology*. Onitsha: Africana Feb Publishers Limited.

O'Toole, F. (2009). *Ship of Fools: How stupidity and corruption sank the Celtic Tiger*. Faber & Faber.

Owen, J., & Harrison, C. (2019). Maintenance of health and safety in work places and their challenges in American retail stores. *Journal of Medicine, Nursing & Public Health, 2*(2), 16-23.

Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Understanding customer expectations of service. *Sloan Management Review, 32*(3), 39-48.

Parihar, J. K. S., Jain, V. K., Chaturvedi, P., Kaushik, J., Jain, G., & Parihar, A. K. (2016). Computer and visual display terminals (VDT) vision syndrome (CVDTS). *Medical Journal Armed Forces India, 72*(3), 270-276.

Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative Social Work, 1*(3), 261-283.

Peng, J., & He, L. (2018). IRS posttranslational modifications in regulating insulin signaling. *Journal Of Molecular Endocrinology*, *60*(1), R1-R8.

Petitta, L., Probst, T. M., Ghezzi, V., & Barbaranelli, C. (2019). Cognitive failures in response to emotional contagion: their effects on workplace accidents. *Accident Analysis & Prevention, 125*, 165-173.

Ponterotto, J. G. (2005). Qualitative research in counseling psychology: A primer on research paradigms and philosophy of science. *Journal of Counseling Psychology*, *52*(2), 126.

Pritchard, A. (2017). *Ways of learning: Learning theories for the classroom*. Routledge.

Raessens, J. (2006). Playful identities, or the ludification of culture. *Games and Culture*, *1*(1), 52-57.

Rajendran, S., & Gambatese, J. A. (2009). Development and initial validation of sustainable construction safety and health rating system. *Journal of Construction Engineering and Management, 135*(10), 1067-1075.

Ranasinghe, P., Wathurapatha, W. S., Perera, Y. S., Lamabadusuriya, D. A., Kulatunga, S., Jayawardana, N., & Katulanda, P. (2016). Computer vision syndrome among computer office workers in a developing country: An evaluation of prevalence and risk factors. *BMC Research Notes, 9*, 1-9.

Rao K. C., Chandu K, Vasantha, V. (1999). Hardships of soft people - A clinical study of ocular and visual discomfort in video display terminal (VDT) users. *Indian Journal of Occupational and Environmental Medicine, 3*(1), 14-7.

Raymond, K., & Hinze, C. (2017). Common construction site hazards in Nairobi County, Kenya. *American Journal of Construction and Building Materials, 1*(1), 26.

Reason, M. (2010). Kinesthesia, empathy, and related pleasures: An inquiry into audience experiences of watching dance. *Dance Research Journal, 42*(2), 49-75.

Reason, R. D. (2003). Student variables that predict retention: Recent research and new developments. *Naspa Journal, 40*(4), 172-191.

Rempel, D. M., Krause, N., Goldberg, R., Benner, D., Hudes, M., & Goldner, G. U. (2006). A randomised controlled trial evaluating the effects of two workstation interventions on upper body pain and incident musculoskeletal disorders among computer operators. *Occupational and Environmental Medicine, 63*(5), 300-306.

Robertson, M. M., Ciriello, V. M., & Garabet, A. M. (2013). Office ergonomics training and a sit-stand workstation: Effects on musculoskeletal and visual symptoms and performance of office workers. *Applied Ergonomics, 44*(1), 73-85.

Roozeboom, M. B., Houtman, I., & Van den Bossche, S. (2008). Monitoring psychosocial risks at work. I. *The European Framework for psychosocial Risk management: PRIMA-EF*, 17-36.

Ross, M. W., Crisp, B. R., Månsson, S. A., & Hawkes, S. (2012). Occupational health and safety among commercial sex workers. *Scandinavian Journal of Work, Environment & Health*, 105-119.

Rudin, C. M. (2015). Treatment of small-cell lung cancer: American Society of Clinical Oncology endorsement of the American College of Chest Physicians guideline. *Journal of Clinical Oncology, 33*(34), 4106-4111.

Sabz Tajari, A., Masoudi Asl, I., & Hessam, S. (2019). An investigation of work-related accidents and its effects on the costs of Social Security Organization over the period of 2012-2016. *Journal of Health Sciences & Surveillance System, 7*(1), 36-39.

Salerno, S., Dimitri, L., & Talamanca, I. F. (2009). Occupational risk due to violence in a psychiatric ward. *Journal of Occupational Health, 51*(4), 349-354.

Segbenya, M., & Yeboah, E. (2022). Effect of occupational health and safety on employee performance in the Ghanaian construction sector. *Environmental Health Insights*, *16*, 11786302221137222.

Shabani, T., Jerie, S., & Shabani, T. (2024). A comprehensive review of the Swiss cheese model in risk management. *Safety in Extreme Environments, 6*(1), 43-57.

Shah, P. B., Reddy, P. S., & Hegde, S. C. (1999). Stress: Occupational health disorder amongst computer professionals. *Indian Journal of Occupational Health, 3*, 71-3.

Sibanyoni, J. J., Tshabalala, P. A., & Tabit, F. T. (2017). Food safety knowledge and awareness of food handlers in school feeding programmes in Mpumalanga, South Africa. *Food Control*, *73*, 1397-1406.

Sirajudeen, M. S., & Siddik, S. S. M. (2017). Knowledge of computer ergonomics among computer science engineering and information technology students in Karnataka, India. *Asian Journal of Pharmaceutical Research and Health Care, 9*(2), 64-70.

Sirajudeen, M. S., Muthusamy, H., Alqahtani, M., Waly, M., & Jilani, A. K. (2018). Computer-related health problems among university students in Majmaah region, Saudi Arabia. *Biomedical Research, 29*(11), 2405-2415.

Simpson, G., & Horberry, T. (2018). *Understanding human error in mine safety*. CRC Press.

Sitaula, R. K., & Khatri, A. (2018). Knowledge, attitudes and practice of computer vision syndrome among medical students and its impact on ocular morbidity. *Journal of Nepal Health Research Council, 16*(3), 291-296.

Smith, L., Louw, Q., Crous, L., & Grimmer-Somers, K. (2009). Prevalence of neck pain and headaches: impact of computer use and other associative factors. *Cephalalgia, 29*(2), 250-257.

Song, Y. (2012). Applying system-theoretic accident model and processes (STAMP) to hazard analysis (Doctoral dissertation). Retrieved from https://macsphere.mcmaster.ca/bitstream/11375/11867/1/fulltext.pdf.

Stata, A. (2015). *Stata base reference manual release 14*. College Park, TX: StataCorp (2015).

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education, 48*, 1273-1296.

Tam, C. H., Ravi, P., Dai, S., & Tan, K. C. (2004). Polymer-induced fractal patterns of [60] fullerene containing poly (methacrylic acid) in salt solutions. *Langmuir*, *20*(23), 9901-9904.

Teo, E. A. L., & Ling, F. Y. Y. (2009). Enhancing worksite safety: Impact of personnel characteristics and incentives on safety performance. *International Journal of Construction Management, 9*(2), 103-118.

Thomas, H., & Turnbull, P. (2018). From horizontal to vertical labour governance: The International Labour Organization (ILO) and decent work in global supply chains. *Human Relations*, *71*(4), 536-559.

Tint, P., Tuulik, V., Karai, D., & Meigas, K. (2014). Health Risks to Computer Workers in Various Indoor Facilities. *Safety of Technogenic Environment*, *5*, 47-50.

Toft, Y., Dell, G., Klockner, K., & Hutton, A. (2012). Models of causation: Safety. Retrieved from http://www.ohsbok.org.au/.

Troyer, A. K., & Rich, J. B. (2018). Multifactorial Memory Questionnaire: Professional manual. Toronto: Baycrest Centre for Geriatric Care. Retrieved from https://www.baycrest.org/BaycrestCentre/media/ content/ form_files/MMQ-Manual-2018_ebook.pdf

Tsauo, J. Y., Jang, Y., Du, C. L., & Liang, H. W. (2007). Incidence and risk factors of neck discomfort: A 6-month sedentary-worker cohort study. *Journal of Occupational Rehabilitation*, *17*(2), 171-179.

Tulchinsky, T. H., & Varavikova, E. A. (2014). Environmental and occupational health. *The New Public Health*, 471.

Unegbu, M. C., Amaechi, N., Njoku, I., & Opara, I. (2015). Influence of socio-demographic variables on the use of information and communication technology by lecturers in library schools in South-east and South-south

Zones of Nigeria. *International Journal of Humanities & Social Science Studies, 11*(11), 279-289.

University of Cape Coast. (2017). *Revised Unified Scheme of Service for Junior Staff of the public universities in Ghana*. UCC Press. Cape Coast Vol 55 (6).

University of Cape Coast. (2017). *Revised Unified Scheme of Service for Senior Staff of the public universities in Ghana*. UCC Press. Cape Coast Vol 55 (3).

University of Cape Coast. (2020). *Human Resource Management System*. Retrieved from Directorate of Human Resource. Enquiries.

University of Cape Coast. (2023). *Revised Unified Scheme of Service for Junior Staff of the public universities in Ghana*. Retrieved from https://ucc.edu.gh/unified-condition-service-unionized-staff-public-universities-ghana.

Vimalanathan, K., & Babu, R. T. (2017). A study on the effect of ergonomics on computer operating office workers in India. *Journal of Ergonomics, 7*(5), 557-567.

Vos, B. C., Nieuwenhuijsen, K., & Sluiter, J. K. (2018). Consequences of traumatic brain injury in professional American football players: A systematic review of the literature. *Clinical Journal of Sport Medicine, 28*(2), 91-99.

Walters, G. D., & Morgan, R. D. (2019). Certainty of punishment and criminal thinking: Do the rational and non-rational parameters of a student's decision to cheat on an exam interact? *Journal of Criminal Justice Education, 30*(2), 276-295.

Watkins, J. O. T. A., Goudge, J., Gómez-Olivé, F. X., & Griffiths, F. (2018). Mobile phone use among patients and health workers to enhance primary healthcare: A qualitative study in rural South Africa. *Social Science & Medicine*, *198*, 139-147.

Whitehead, S., Cambridge, M. L., & Renton, M. (2018). A functional structural model of ephemeral seagrass growth influenced by environment. *Annals of Botany*, *121*(5), 897-908.

Woodford, P. J. (2018). *The Moral Meaning of Nature: Nietzsche's Darwinian Religion and Its Critics*. University of Chicago Press.

World Health Organization. (2011). Global HIV/AIDS response: Epidemic update and health sector progress towards universal access: progress report 2011. In *Global HIV/AIS response: endemic update and health sector progress towards universal access: progress report 2011*. Retrieved from https://digitallibrary.un.org/record/3942837?ln=en%3Fln%3Den&v=pdf.

World Health Organisation. (2015). *Global status report on road safety 2015*. World Health Organisation.

World Health Organisation. (2019). *Building bridges in preparedness: report of a stakeholder consultation on national health security and pandemic influenza preparedness planning, Accra, Ghana, 5–7 December 2017* (No. WHO/WHE/CPI/2019.14). World Health Organisation.

Yanar, B., Amick III & Van Eerd, D. (2019). How are leaders using benchmarking information in occupational health and safety decision-making? *Safety Science*, *116*, 245-253.

You, Z. H., Huang, Li, Z. W., Wen, Z., & Chen, X. (2017). PBMDA: A novel and effective path-based computational model for miRNA-disease association prediction. *PLoS Computational Biology*, *13*(3), e1005455.

Zhu, C. J., Fan, D., Fu, G., & Clissold, G. (2010). Occupational safety in China: Safety climate and its influence on safety-related behavior. *China Information, 24*(1), 27-59

Zou, M. (2016). China's fragmented occupational safety and health regime: An analysis of the work safety law and the occupational diseases law. *Lawasia Journal*, 1.

Zwilling, M., Lesjak, Phusavat, K., & Anussornnitisarn, P. (2019). How to deal with the awareness of cyber hazards and security in (Higher) education. In *Thriving on future education, industry, business and society. Proceedings of the Makelearn and TIIM International Conference* (pp. 433-439).

# APPENDICES

## APPENDIX A

## UNIVERSITY OF CAPE COAST (UCC)

## COLLEGE OF EDUCATION STUDIES

## FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION

## DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION (HPER)

## QUESTIONNAIRE FOR ADMINISTRATORS

I am Sarah Annim, a student reading MPhil Health Education at the Department of HPER, UCC. I am contacting you to participate in this academic research titled: **"Impact of Computer Usage on the Health of Administrators at the University of Cape Coast."** This research aims to examine the effects of the use of computers and associated factors on the health and safety of administrators in UCC, and establish the influence of socio-demographic factors in the occurrence of health and safety challenges among the workers. Your participation in this study requires that you complete a survey that will take about 15 minutes of your time. You were selected among a pool of participants and your responses will be analysed as a group. While your participation in this study is critical to ameliorating the adverse effects of the use of computers on health status, your participation is completely voluntary and can be terminated in the course of providing responses. Apart from your time, you are assured this study poses no harm to you, your department or faculty. Responses provided will be handled confidentially and only aggregated data will be used for the analysis.

No information that will identify you is required. If you fully understand your duties and agree to take part in this research, please sign in the space below.

Signature……

Date……

You may contact my supervisors for any further information **Dr. Edward Wilson Ansah (0247703379)**

You may also contact me **(Sarah Annim)** on **0241010736** or **sarah.annim@ucc.edu.gh**

Thank you for your participation.

**SECTION A**

**DEMOGRAPHIC PROFILE**

**Please either provide a response or tick (√) against the answer that best fits your response.**

1. Gender of respondent:

☐ a. Male

☐ b. Female

2. Age of respondent a. 20-29☐ b. 30-39☐

c. 40-49☐ d. 50-59☐

e. 60-69☐

3. Marital status:

☐ a. Single

☐ b. Married

☐ c. Living with a partner

☐ d. Separated/divorced

☐ e. Widow/widower

4. What is your level of education?

   a. Postgraduate

   b. Graduate

   c. Diploma

   d. Advance Level

   e. Ordinary Level

   f. Senior High School

**WORK EXPERIENCE**

5. Which directorate/faculty/department/Unit do you belong to? ……..……
……
……..……

6. Which category best describes your rank:

☐ a. Senior Member Administrator

☐ b. Senior Staff Administrator

☐ c. Junior Staff Administrator

7. How many years have you been using the computer for your work? .....

8. On average, how many hours a day do you use the computer for official duties? ……

**SECTION B**

**AWARENESS OF HEALTH HAZARDS ASSOCIATED WITH USE OF COMPUTER**

9. Do you know that there are health hazards associated with computer use?

☐ a. Yes

☐ b. No

10. Do you know how display screen equipment should be arranged so that users can work without experiencing strain whilst at their workstation?

☐ a. Yes

☐ b. No

11. Please select all that you are aware of from the list below.

☐ a. I know what the distance between the monitor and the user should be.

☐ b. Overstretching for or placing the mouse too close to the body can cause repetitive strain disorder.

☐ c. I know the distance and alignment of the keyboard from the user's body.

☐ d. I am aware of what the height of the chair should be from the ground.

☐ e. I know the kind of work surface that is suitable for computer users.

☐ f. All the above.

☐ g. None of the above.

| Srl no. | Aches and pains can be caused by… | Strongly agree | Agree | Disagree | Strongly disagree | Not Sure |
|---|---|---|---|---|---|---|
| 12. | Doing repetitive work | | | | | |
| 13. | Uncomfortable working postures. | | | | | |
| 14. | Incorrect screen settings | | | | | |
| 15. | Carrying out task for long periods without suitable rest breaks | | | | | |

**SECTION C**

**HEALTH CHALLENGES ASSOCIATED WITH COMPUTER USE**

16. Do you have any eye problems because of using the computer?

☐ a. Yes

☐ b. No

17. If you answered yes to question 15, tick all that applies.

☐ a. Eye ache

☐ b. Watery eyes

☐ c. Double vision

☐ d. Redness

☐ e. Dry eyes

☐ f. Eye strain

☐ g. Blurred vision

☐ h. Burning sensation.

☐ i. Itching

18. Do you experience back pain after using computer continuously for an hour or more?

☐ a. Yes

☐ b. No

19. If you answered yes to the question above, which part of your back do you feel this pain?

☐ a. Upper back

☐ b. Lower back

20. Do you experience neck pain after using computer continuously for an hour or more?

☐ a. Yes

☐ b. No

21. Do you experience numbness in your legs after using computer continuously for an hour or more?

☐ a. Yes

☐ b. No

22. Do you experience wrist pain after using computer continuously for an hour or more?

☐ a. Yes

☐ b. No

23. Do you experience shoulder pain after using computer continuously for an hour or more?

☐ a. Yes

☐ b. No

24. Do you experience headache after using computer continuously at work?

☐ a. Yes

☐ b. No

25. Apart from the above, which other discomfort do you experience after using computer continuously for an hour or more? Kindly describe it here…….....

26. How long has the symptom persisted?

……

27. Have you ever reported at the hospital on account of any of the above negative experiences associated with computer use?

☐ a. Yes

☐ b. No

28. Have you ever been absent from work on account of any of the above negative experiences associated with computer use?

☐ a. Yes

☐ b. No

29. If yes to question (27) above, for how long were you absent from work?

☐ a. One to three days

☐ b. Four to seven days

☐ c. Two weeks

☐ d. More than two weeks

30. Which of the following have you ever heard of? Please tick all that applies.

☐ a. Carpal Tunnel syndrome

☐ b. Computer vision syndrome

☐ c. Musculoskeletal disorder

☐ d. None of the above

31. Have you ever been diagnosed of any of the following? Please tick all that applies.

☐ a. Carpal Tunnel syndrome

☐ b. Computer vision syndrome

☐ c. Musculoskeletal disorder

☐ d. None of the above.

**SECTION D**

**SAFETY MEASURES PROVIDED BY MANAGEMENT**

32. Management of the University is obliged to protect administrators against hazards of computer use.

☐ a. Yes

☐ b. No

| Srl | Management | Strongly agree | Agree | Disagree | Strongly disagree | Not Sure |
|---|---|---|---|---|---|---|
| 33. | Provides protective computer accessories such as screen protectors etc. for all administrators who use computers. | | | | | |
| 34. | Conducts annual | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | computer use risk assessment. | | | | | |
| 35. | Ensure that work stations are designed and set-up in a way that promotes and protects the health and well-being of administrators. | | | | | |
| 36. | Conducts medical screening involving specific body parts such as eye, waist, back, wrist etc. for all administrators. | | | | | |
| 37. | Organises in-service training on safety practices for administrators. | | | | | |

THANK YOU