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# Occupational Hazards and Control Needs of Computer Operators in Public Universities in Rivers State

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**ABSTRACT**
This study explores the on occupational hazards and control needs of computer operators in public universities in Rivers State. The population for this study comprised of 1,040 computer operators in public universities in Rivers State. Descriptive cross-sectional survey design was adopted for the study. The sample size was four hundred and fifty respondents. Data was collected using a self-structured questionnaire with a reliability coefficient of 0.76 and was analysed using descriptive statistics while chi-square was used for testing the hypotheses at 0.05 level of significance. The study revealed that a majority of the population faced high ergonomic hazards, particularly among computer operators. It was concluded that computer operators was associated with various levels of occupational hazards. It recommended amongst others that regular awareness and educative programmes should be directed to computer operators in the University campuses by relevant stake holders and management in the control of occupational hazards associated with their work.
**Keywords:** Occupation, Hazard, Occupational Hazards, Control, Computer Operators

## INTRODUCTION

In recent years, computer application has been Important in nearly all kinds of occupational formal or informal activities. Few jobs may be found in which computers are not applied. The digital age has propelled computers into the heart of almost every profession, with public universities in Rivers State being no exception. Countless hours are spent navigating virtual landscapes, wielding the keyboard as a wand to conjure information and weave digital tapestries. But beneath the surface of this technological prowess lurks a shadow – a tapestry woven not of data, but of occupational hazards faced by the unseen hands behind the screen: the computer operators (Adeyemi & Adebayo, 2017).

The presence of computer in the workplace leads to a set of peculiar characteristics of the workstation which require the workers to stay in a static posture for long periods**.** Computers influence every sphere of human activity and bring changes in education, industries, and health care (Konnur 2012). This has led to an increase in computer related injuries like back pain, neck pain, repeated strain injuries, computer vision syndrome. Occasional computer users may notice no ill effects; however those who spending several hours a day for many years especially computer professionals should pay careful attention to ergonomics. However, ocular discomfort, musculoskeletal disorders and psychosocial problems form the key category of the health problem found among constant computer users (Dandannavar & Goudar, 2015).

Prolonged use of computers and keyboard can cause orthopedic injuries from repetitive strain. Repetitive strain injury (RSI) is a cumulative traumatic disorder resulting from prolonged, forceful or awkward movements. Persons affected by RSI include musicians, and those with frequent use of computer mouse

and keyboard. Posture stress due to poor workstation ergonomics such as inappropriate location of the monitor, keyboard or mouse has been found to be associated with musculoskeletal problems (Bhanderi et al 2018; Giri, 2010).

The computer is a vital tool in many different job or institution and activities for workers and individual users. Inappropriate use of computer increases the chance of causing muscular and joint pains, overuse injuries of the shoulder, arm, wrist or hand and eye strain (Department of Health, 2015). The physical health problems association with computer use could be prolonged sitting in one position leading posture-related injuries, back and neck pain, headaches, upper limbs pains. The overuse injury typically occurs as a result of exposure to physical hazard causing muscles and tendons become painful with repetitive movement and awkward postures (Department of Health, 2015). In a work by Ijdunola et al (2013) revealed that 57% keyboard operators experienced symptoms emanated as overuse syndrome and 70% of computer operators had varying degrees of visual fatigue or eyestrain. Gert et al (2016) asserted that placing keyboard below the elbow, limiting head rotation and resting of arms reduces the risk of neck/shoulder outcomes. Gender or sex of the computer operator may be another factor or correlates of occupational hazards. It could be that male operators are easily get burnout with operating computer due to hazard than the female counterparts. Therefore the threats extend beyond the physical. The constant mental acrobatics demanded by multitasking and information overload take their toll, weaving anxieties and frustrations into the fabric of the workday (Akter et al., 2011). The invisible isolation within a sea of digital connections can fester loneliness and erode well-being (Bhattacharjee, 2004).

Sadly, amidst the hum of fluorescent lights and the whirring of hard drives, these hazards often go unnoticed, their insidious effects accumulating silently like lines of code in a forgotten corner of the system. Many operators, especially those self-employed, lack the knowledge or resources to mitigate these risks, rendering them vulnerable to a silent epidemic of occupational ill-health (Oginni & Adegbesan, 2018).

This study delves into the labyrinthine depths of this neglected realm, seeking to identify and expose the occupational hazards that plague computer operators in public universities across Rivers State. We aim to shed light on the ergonomic, psychosocial, and even environmental threats that cast their shadows on these crucial cogs in the university machinery.

Beyond mere diagnosis, however, our quest extends to the realm of solutions. Aiming to map out a landscape of effective control measures, crafting a symphony of interventions that can mitigate the pain, soothe the anxieties, and illuminate the path towards a healthier, more fulfilling experience for computer operators.

Through this critical exploration, we hope to not only elevate the well-being of these vital contributors to the academic ecosystem but also inspire a broader conversation about the hidden costs of our digital dependence. For ultimately, ensuring the seamless flow of information should not come at the expense of human health and well-being. It is time to rewrite the code of our working practices, ensuring that the benefits of technology reach not just the screen, but the hearts and minds of those who make it tick.

**Statement of problem**

Millions of people around the world now use computers as their primary business tool. In the last decade or so, the number of hours people use computers has increased tremendously. With this increase in the use of computers, problems have also increased. Some of the most common problems related to computer use are Carpal tunnel syndrome, repetitive strain injury, computer eyestrain, computer vision syndrome. These conditions are far easier to prevent than to cure once contracted, by having a healthy lifestyle and work habits and working at ergonomically good workstation. Computer operator's work involves a constant sitting position that lasts for long hours; this most of the time leads to structural health challenges, lifelong disability if proper precautions are not taken. In addition, there is also long hour use of the eye ball which leads to vision impairment. Determining the occupational hazards among computer operators is pertinent since many of them are self-employed with little or no concern for preventing the dangers associated with their work. Some of these operators work from year to year without any form of concern for their health especially for their eyes that are spent on the computer systems for hours. This makes them to be vulnerable to stress, and poor health.

Poor knowledge of coping strategies of risk factors for based on their job has been observed among computer operators in tertiary institutions. Hence, this prompts the question as to what are occupational health problems among computer operators, since this occupation has been identified to result in some health challenges. Hence, it is necessary in order to clarify the problems faced by computer operators in public universities with regards to determining work related issues so that subsequently, appropriate interventions can be designed for them. The public universities in Rivers State have numerous computer operation. However, the problems associated with computer operators in Rivers State have not been appropriately handled and documented. It is against this back drop that the researcher want to carry out to recommended intervention and remedy to problems faced by computer operators.

**Aim and Objectives of the Study**

The aim of this study is to assess occupational hazards and control needs of computer operators in public universities in Rivers State. Specifically, the study sought to:

1. Investigate the ergonomic hazards of computer operators in public universities in Rivers State
2. Assess the psychosocial hazards of computer operators in public universities in Rivers State
3. Determine the level of occupational hazards of computer operators in public universities in Rivers State based on socio-demographic variables such as age, work experience, educational level and training.
4. Examine the control needs of computer operators in public universities in Rivers State

**Research Questions**

The following research questions were raised to guide the study.

1) What are the ergonomic hazards of computer operators in public universities in Rivers State?
2) What are the psychosocial hazards of computer operators in public universities in Rivers State?
3) What are the level of occupational hazards of computer operators in public universities in Rivers State based on socio-demographic variables such as age, work experience, educational level and training?
4) What are the control needs of computer operators in public universities in Rivers State?

**Hypothesis**

The following null hypotheses were formulated for testing in the study:

**1.** There is no significant relationship between age and level of occupational hazards of computer operators in public universities in Rivers State.
**2.** There is no significant relationship between work experience and level of occupational hazards of computer operators in public universities in Rivers State
**3.** There is no significant relationship between educational level and level of occupational hazards of computer operators in public universities in Rivers State
**4.** There is no significant relationship between training and level of occupational hazards of computer operators in public universities in Rivers State

## LITERATURE REVIEW

### Health Hazards

According to Safe work Australia (2010), hazard is a situation or thing that has the potential to harm a person. Occupational health hazard is the risk, harm, or danger that an individual is exposed to at the workplace whereas occupational disease appears to occur less frequently than other major debilitating diseases. A hazard is an agent that can cause harm or damage to a human, properties or environment. Risk is defined as the probability and exposure to hazard which leads to a negative consequences. A hazard poses no risk of there is no exposure to that hazard. Anepama and Practinha (2015) defined hazard as an agent which has the potential to cause him to a vulnerable target. The consequences incident of hazard is combined with occurrence which constitute the associate risk. If there is no possibility of a hazard contribution towards an incident there is no risk, (Hudsoim, 2015) in case where the type of risk (i.e. the possible lying or harm to health) stems largely or entirely from one type of hazard, the issues surrounding technology might not be problematic. However, harm may result from the interaction of several hazards, such as the synergistic effect of psychosocial and biomechanical hazard and etotoxic chemicals that in

combination with noise, have a more detrimental effect on hearing than noise alone, in such case, the damaging energies concept may result in risk being controlled independently of each other (Macdonald, 2015).

**Occupational Hazard**

Occupational hazard as a term signifies both long-term and short term risk associated with the workplace environment. When work is associated with health hazards, it may progressively lead to injuries, accidents, damage, occupational diseases and may aggregate existing ill-health of non-occupational origin. According to OSHA (2012), hazards not related to the explosion during inspection in Brewery Company as deficiencies in procedure for work in a confirmed space. Non-use of PPE, unguarded machinery among others. Awodele et al (2014) defined occupational hazards as any risk, harm, or danger that an individual is exposed to at the work place. Exposure to risk or hazardous causes injuries, accident, fear, anxiety, damage, loss of functions among others. Potential hazard can be classify as air containments, chemical hazards, biological hazards, physical hazards, ergonomic hazards, and psychosocial hazards all which is identity at the workplace. The rising causing of injuries, sickness, impaired health and well-being or significant discomfort among operators lead to the prevalence of occupational hazards. Some of the occupational hazards include;

**Air contaminants:** These are particulate or gas and vapour contaminants associated with processing products that has an adverse effects on the health of the workers at the work environment such as solid particles emanated from handling, crushing, grinding, colliding, exploding and heating alcohol etc. should be regarded as hazardous (WHO, 2016). Evaporation of chemicals, volatile forum of substances that could be normally in a solid or liquid state at room temperature and pressure are symptomatic to hazards.

**Chemical hazards:** Harmful chemical compounds and element above the ambient level in form of solids, liquids, gases, mists, dusts, fumes and vapours exists toxicity effects by breathing, absorption, through the skin, and ingestion. Airborne chemical hazards exist as concentrations of mists, vapours, gases, fumes or solids are corrosive to the health of the workers. The degree of workers risk from exposure to any given substances depends on the nature and potency of the toxicity and magnitude and duration of exposure (WHO, 2016).

**Biological hazards:** Workers in computer Company have an existing chance of exposure to microorganisms such as bacteria, viruses, fungi, protozoa and other living organisms that may cause occupational disease through indirect or direct invasion to the body of the victims. Since computer company deal with typing of documents, processing of information workers are more likely to expose to biological hazards (WHO, 2016). Effective personal hygiene, particularly proper attention to minor ailment or injuries helps keep workers risks to a minimum. Brewery where there may be potential exposure to biological hazards, workers should practice proper personal hygiene and utilize PPE. Ahyu, et al (2009) revealed that occupational hazard link with exposure to chemical fumes (6.4%), noise pollution (40.9%) and chemical burn (9.1%) respectively causes injuries are frequent among workers.

**Physical hazards:** This includes excessive level of noise, vibration, temperature, illumination, sparks, improper positioning of equipment, slippery floor, radiant heat exposure from the desktop and laptop computer system. Physical hazards are subtype of occupational hazards that involve environmental hazards that may cause harm with or without contact. (Harwood, 2015).

**Ergonomic hazards:** Occupational hazard with range of task not limiting to lifting holding, pushing, walking and reaching. This may occur when there is mismatch of body physique with the position at work not depicting exact position or status of the workers.

**Occupational hazards Prevention and Control Needs**

Effective and efficient control protect workers from work place hazards; help to avoid injuries, illnesses and accidents; minimize or eliminate safety and health risks, and help employers providers workers with safe and healthful working condition (OSHA, 2012). OSHA (2016) outlined the effective control and prevention of hazard to be employed by employers should;

**Empirical Review**

Ijadunola, et al (2003) examined the perceptions of occupational hazards amongst office workers at the Obafemi Awolowo University, Ile-Ife. The survey employed a descriptive cross-sectional design. Data were generated through the use of a structured self-administered questionnaire and a non-participant observation. Between 39% and 47% of the respondents expressed dissatisfaction with the level of control of the factors of the work environment (heat, noise, illumination, space, ergonomics). Two-thirds of respondents presented with work-related low backache, and this was more so for respondents who had spent at least 10 years on the job than those who had spent less. Of the 227 keyboard operators interviewed, 130 (57%) experienced symptoms suggestive of the overuse syndrome and 70% of the 82 computer operators interviewed had experienced varying degrees of visual fatigue since their appointments. The study concluded that the present design and layout of offices/workstations and access to equipment at the Obafemi Awolowo University, Ile-Ife is not optimal and tend to promote unnecessary physical efforts.

Levanon, et al (2012) worked on reducing musculoskeletal disorders among computer operators: comparison between ergonomics interventions at the workplace. This control study aimed to evaluate the efficacy of a workplace intervention for reducing MSDs among computer workers. Sixty-six subjects with and without MSD were assigned consecutively to one of three groups: ergonomics intervention (work site and body posture adjustments, muscle activity training and exercises) accompanied with biofeedback training, the same ergonomics intervention without biofeedback and a control group. Evaluation of MSDs, body posture, psychosocial status, upper extremity (UE) kinematics and muscle surface electromyography were carried out before and after the intervention in the workplace and the motion lab. The main hypothesis that significant differences in the reduction of MSDs will exist between subjects in the study groups and controls was confirmed ($\chi 2 = 13.3$; $p = 0.001$). Significant changes were found in UE kinematics and posture as well. Both ergonomics interventions effectively reduced MSD and improved body posture.

Golebowicz, et al, (2015) carried out a study on the efficacy of a tele-rehabilitation intervention programme using biofeedback among computer operators. The study is aimed at investigating the feasibility and effectiveness of a tele-biofeedback ergonomic intervention programme among computer operators suffering from WRMSD. Twelve subjects with WRMSD were assigned an ergonomic intervention accompanied by remote tele-biofeedback training, which was practised at their workstations. Evaluations of pain symptoms and locations, body posture and psychosocial characteristics were carried out before and after the intervention in the workplace. The hypothesis was partially verified as it showed improved body position at the workstation and decreased pain in some body parts. Tele-biofeedback, as part of an intervention, appears to be feasible and efficient for computer operators who suffer from WRMSD. This study encourages further research on tele-health within the scope of occupational therapy practice.

Kryger, et al (2003) worked on the occurrence of pain conditions and disorders in the forearm and to evaluate risk factors for forearm pain in a cohort of computer workers. The aim of the study was to determine the occurrence of pain conditions and disorders in the forearm and to evaluate risk factors for forearm pain in a cohort of computer workers. A cross sectional survey design was adopted and carried out with a total population of 6943 participants with a wide range of computer use and work tasks were studied. At baseline and at one year follow up participants completed a questionnaire. Participants with relevant forearm symptoms were offered a clinical examination. The seven days prevalence of moderate to severe forearm pain was 4.3%. Sixteen of 296 symptom cases met criteria for being a clinical forearm case, and 12 had signs of potential nerve entrapment. High job demands and time pressure at baseline were risk factors for onset of forearm pain; women had a twofold increased risk of developing forearm pain. Self reported ergonomic workplace factors at baseline did not predict future forearm pain. Conclusion, intensive use of a mouse device, and to a lesser extent keyboard usage, were the main risk factors for forearm pain.

## METHODOLOGY

### Research Design

A descriptive cross-sectional survey design was adopted for this study. This design attempt to described, investigates, explain and analysis events or phenomenon in regards to occupational hazards linked with computer operation on a natural setting with no intention to manipulate any variables. Therefore, this design examined the occupational hazards and control needs of computer operators working in public universities in Rivers State.

### Population of the Study

The estimated population of computer operators in public universities in Rivers State including IAUE (210), Uniport (450), RSU (380) amounted to 1,040 used for the study (Junior Staff Secretary Office, 2022).

**Proportion of population selected for the study**

| S/N | Name of Institution | Estimated population | Sample |
|---|---|---|---|
| 1 | University of Port Harcourt | 450 | 150 |
| 2 | River State University | 380 | 150 |
| 3 | Ignatius Ajuru University of Education | 210 | 150 |
| | **Total** | **1040** | **450** |

### Sample and Sampling Technique

The sample size was estimated using Taro Yamane method for a large population. The sample size for this was

$$n = \frac{N}{1+N(e)^2}$$

That is;

$$n = \frac{1040}{1+1040(0.05)^2}$$

$$n = \frac{1040}{1041(0.0025)}$$

$$n = \frac{1040}{2.6025}$$

n = 399.61 (400 approximately) + 50 non responses

The sample size for the study is 450

### Instrument for Data Collection

The instrument for eliciting information was a self-strutured questionnaire titled "occupational hazards and control needs of computer operators" The instrument were in two sections A and B. Section A, was information on socio-demographic characteristics of the participants of the study while section B revealed information about occupational health problems.

### Validity of the Instrument

This instrument was validated by three experts which the supervisor and two experts from the department of Human Kinetics, Health and Safety Studies. Copies of the instrument alongside the objectives, research question and hypotheses were given to these experts for moderation, suggestion and criticism, correction from these experts were adopted in writing the final copy of the instrument. Hence, the instrument was valid and used for the study.

### Reliability of the Instrument

Split half method was employed to determine the degree of consistency of the research instrument, 450 copies of the instrument were administered to computer operators in Public Universities in Rivers State which is similar to the area of the study. The reliability index of 0.74 were obtain using Pearson product moment correlation coefficient (PPMC) which show positive correlation. Hence, the instrument was reliable and applicable for the sturdy.

**Method of Data Analysis**

Data collected were coded using excel spread sheet and was exported to Statistical Product for the Service Solutions (SPSS). Analysis were done using the descriptive statistics of frequency and percentages (%), mean, standard deviation for demographic data and for research questions 1-7. Inferential statistics of chi-square were used to test the null hypotheses for 1-6 at 0.05 alpha level.

## RESULTS AND DISCUSSION

**Table 4.1: Socio-demographic data**

| Items | (N=) | Frequency | Percentages |
|---|---|---|---|
| **Age** | | | |
| < 20 years | | 86 | 20.5 |
| 21-30 years | | 132 | 31.4 |
| 31-40 years | | 134 | 31.9 |
| 41-50 years | | 68 | 16.2 |
| **Gender** | | | |
| Male | | 186 | 44.3 |
| Female | | 234 | 55.7 |
| **Education** | | | |
| Primary | | 42 | 10.0 |
| Secondary | | 218 | 51.9 |
| Tertiary | | 160 | 38.1 |
| **Training** | | | |
| Yes | | 276 | 65.7 |
| No | | 144 | 34.3 |
| **Working experience** | | | |
| < 5 years | | 226 | 53.8 |
| 6-10 years | | 98 | 23.3 |
| 11-15 years | | 34 | 8.1 |
| 16 years and above | | 62 | 14.8 |

Table 4.1 shows the socio-demographic data of respondents. The result showed that 86(20.5%) of the respondents were aged <20 years, 132(31.4%) 21-30 years, 134(31.9%) 31-40 years and 68(16.2%) were aged 41-50 years. About 186(44.3%) were males and 234(55.7%) were females. For education, 42(10.0%) had primary education, 218(51.9%) had secondary and 160(38.1%) had tertiary education. On training, 276(65.7%) were trained while 144(34.3%) were not trained. For working experience, 226(53.8%) have worked for <5 years, 98(23.3%) 6-10 years, 34(8.1%) 11-15 years and 62(14.8%) worked for 16 years and above.

**Research Question 1**: *What are the ergonomic hazards of computer operators in public universities in Rivers State?*

**Table 4.2: Ergonomic hazards of computer operators**

| S/N | Items | True Freq % | False Freq % |
|---|---|---|---|
| 1 | Prolong sitting on the computer system can lead to back pains | 360(85.7) | 60(14.3) |
| 2 | Poor working position can lead to waist pain | 306(72.9) | 114(27.1) |
| 3 | Muscular skeletal pain may occur because of work load | 246(58.6) | 174(41.4) |
| 4 | Multiple tasking results to body disorderliness | 352(83.8) | 68(16.2) |
| 5 | Position of computer screen monitor may be dangerous | 272(64.8) | 148(35.2) |
| | **Grand Total** | **307(73.0)** | **113(27.0)** |

Decision: >50% High, <50% Low

Table 4.5 shows the ergonomic hazards of computer operators in public universities in Rivers State. The result shows that 307(73.0%) of the population had high ergonomic hazards.

**Research Question 2**: *What are the psychosocial hazards of computer operators in public universities in Rivers State?*

**Table 4.3: Psychosocial hazards of computer operators**

| S/N | Items | True Freq % | False Freq % |
|---|---|---|---|
| 1 | Poor human relation may lead to psychological issues | 244(58.1) | 176(41.9) |
| 2 | Abuse from other workers can lead to quarrel | 264(62.9) | 158(37.1) |
| 3 | Pressure from costumers may be a problem | 292(69.5) | 128(30.5) |
| 4 | Poor relationship with fellow workers on daily basis can lead to stress | 210(50.0) | 210(50.0) |
| 5 | Too many customers leads to over working | 370(88.1) | 50(11.9) |
| 6 | Overcrowding of the computer center may lead to abuse | 174(41.4) | 246(58.6) |
| | **Grand Total** | **259(61.7)** | **161(38.3)** |

Decision: >50% High, <50% Low

Table 4.6 shows the psychosocial hazards of computer operators in public universities in Rivers State. The result shows that 259(61.7%) of the population had high psychosocial hazards.

**Research Question 3**: *What is the level of occupational hazards of computer operators in public universities in Rivers State based on socio-demographic variables such as age, work experience, educational level and training?*

**Table 4.4: Occupational hazards and age, work experience, educational level and training**

| Items | Level of occupational hazards control needs | | Total Freq % |
|---|---|---|---|
| | High Freq % | Low Freq % | |
| **Age** | | | |
| < 20 years | 34(39.5) | 52(60.5) | 86(100) |
| 21-30 years | 127(96.2) | 5(3.8) | 132(100) |
| 31-40 years | 80(59.7) | 54(40.3) | 134(100) |
| 41-50 years | 34(50.0) | 34(50.0) | 68(100) |
| Total | 275(65.5) | 145(34.5) | 420(100) |
| **Education** | | | |
| Primary | 3(7.1) | 39(92.9) | 42(100) |
| Secondary | 138(63.3) | 80(36.7) | 218(100) |
| Tertiary | 134(83.8) | 26(16.3) | 160(100) |
| Total | 275(65.5) | 145(34.5) | 420(100) |
| **Training** | | | |
| Yes | 242(87.7) | 34(12.3) | 276(100) |
| No | 33(22.9) | 111(77.1) | 144(100) |
| Total | 275(65.5) | 145(34.5) | 420(100) |
| **Working experience** | | | |
| < 5 years | 145(64.2) | 81(35.8) | 226(100) |
| 6-10 years | 96(98.0) | 2(2.0) | 98(100) |
| 11-15 years | 31(91.2) | 3(8.8) | 34(100) |
| 16 years and above | 3(4.8) | 59(95.2) | 62(100) |
| Total | 275(65.5) | 145(34.5) | 420(100) |

Table 4.7 shows the level of occupational hazards control needs of computer operators in public universities in Rivers State based on socio-demographic variables such as age, work experience, educational level and training. The result showed that 34(39.5%) of the respondents who were aged <20 years, 127(96.2%) 21-30 years, 80(59.7%) 31-40 years and 34(50.0%) aged 41-50 years had high level of occupational hazards. It showed that 3(7.1%) who had primary education, 138(63.3%) who had secondary and 134(83.8%) who had tertiary education had high level of occupational hazards. On training, 242(87.7%) who were trained and 33(22.9%) who were not trained had high level of occupational hazards. For working experience, 145(64.2%) who have worked for <5 years, 96(98.0%) 6-10 years, 31(91.2%) 11-15 years and 3(65.5%) who worked for 16 years and above had high level of occupational hazards.

**Research Question 4:** *What are the control needs of computer operators in public universities in Rivers State?*

**Table 4.5: Control needs of computer operators in public universities in Rivers State Universities**

| S/N | Items | Mean | Standard Deviation |
|---|---|---|---|
| 1 | I use face shields | 2.41 | 1.08 |
| 2 | I use nose masks | 1.76 | 1.03 |
| 3 | Is there eye goggle | 2.37 | 0.99 |
| 4 | Is there ear muff | 2.67 | 0.90 |
| 5 | I use apron | 2.26 | 1.22 |
| 6 | I use hand glove | 2.38 | 1.33 |
| 7 | I use canvas | 2.10 | 1.16 |
| 8 | I go for vaccination | 2.53 | 1.01 |
| 9 | I go for regular medical examination | 2.04 | 1.04 |
| 10 | I clean the shop | 1.32 | 0.69 |
| 11 | I carry out safe and proper disposal of sharp objects such as needles, blades etc | 1.48 | 0.77 |
| 12 | I sanitize after using equipment | 1.48 | 0.67 |
| | **Grand total** | **2.06** | **0.99** |

Criterion mean = 1.50

The result showed that the grand mean of 2.06±0.99 is greater than the criterion mean of 1.50, indicating good control needs of computer operators in public universities in Rivers State. Thus, the control needs of computer operators in public universities in Rivers State were good.

**Hypotheses**

Hypothesis 1: There is no significant relationship between age and level of occupational hazards of computer operators in public universities in Rivers State.

**Table 4.9: Chi-square test showing significant relationship between age and level of occupational hazards of computer operators in public universities in Rivers State**

| Items | Level of occupational hazards control needs | | Total Freq % | df | $X^2$-value | p-value | Decision |
|---|---|---|---|---|---|---|---|
| | High Freq % | Low Freq % | | | | | |
| **Age** | | | | | | | |
| < 20 years | 34(39.5) | 52(60.5) | 86(100) | 3 | 89.949 | 0.000 | Rejected |
| 21-30 years | 127(96.2) | 5(3.8) | 132(100) | | | | |
| 31-40 years | 80(59.7) | 54(40.3) | 134(100) | | | | |
| 41-50 years | 34(50.0) | 34(50.0) | 68(100) | | | | |
| Total | 275(65.5) | 145(34.5) | 420(100) | | | | |

*Statistical significant ($p<0.05$)

The finding of the study showed that there is significant relationship between age and level of occupational hazards of computer operators in public universities in Rivers State ($X^2$–value = 89.949; df = 3, $p<0.05$). Therefore, the null hypothesis which states that there was no significant relationship between age and level of occupational hazards of computer operators in public universities in Rivers State was rejected.

**Hypothesis 2**: There is no significant relationship between work experience and level of occupational hazards of computer operators in public universities in Rivers State

**Table 4.10: Chi-square test showing significant relationship between work experience and level of occupational hazards of computer operators in public universities in Rivers State**

| Items | Level of occupational hazards control needs | | Total Freq % | df | $X^2$-value | p-value | Decision |
|---|---|---|---|---|---|---|---|
| | High Freq % | Low Freq % | | | | | |
| **Working experience** | | | | | | | |
| < 5 years | 145(64.2) | 81(35.8) | 226(100) | 3 | 156.701 | 0.000 | Rejected |
| 6-10 years | 96(98.0) | 2(2.0) | 98(100) | | | | |
| 11-15 years | 31(91.2) | 3(8.8) | 34(100) | | | | |
| 16 years and above | 3(4.8) | 59(95.2) | 62(100) | | | | |
| Total | 275(65.5) | 145(34.5) | 420(100) | | | | |

*Statistical significant (p<0.05)

The finding of the study showed that there is significant relationship between work experience and level of occupational hazards of computer operators in public universities in Rivers State ($X^2$–value = 156.701; df = 3, p<0.05). Therefore, the null hypothesis which states that there was no significant relationship between work experience and level of occupational hazards of computer operators in public universities in Rivers State was rejected.

**Hypothesis 3**: There is no significant relationship between educational level and level of occupational hazards of computer operators in public universities in Rivers State

**Table 4.11: Chi-square test showing significant relationship between level of education and level of occupational hazards of computer operators in public universities in Rivers State**

| Items | Level of occupational hazards control needs | | Total Freq % | Df | $X^2$-value | p-value | Decision |
|---|---|---|---|---|---|---|---|
| | High Freq % | Low Freq % | | | | | |
| **Education** | | | | | | | |
| Primary | 3(7.1) | 39(92.9) | 42(100) | 2 | 87.316 | 0.000 | Rejected |
| Secondary | 138(63.3) | 80(36.7) | 218(100) | | | | |
| Tertiary | 134(83.8) | 26(16.3) | 160(100) | | | | |
| Total | 275(65.5) | 145(34.5) | 420(100) | | | | |

*Statistical significant (p<0.05)

The finding of the study showed that there is significant relationship between level of education and level of occupational hazards of computer operators in public universities in Rivers State ($X^2$–value = 87.316; df = 2, p<0.05). Therefore, the null hypothesis which states that there was no significant relationship between level of education and level of occupational hazards of computer operators in public universities in Rivers State was rejected.

**Hypothesis 4**: There is no significant relationship between training and level of occupational hazards of computer operators in public universities in Rivers State Universities

**Table 4.12: Chi-square test showing significant relationship between training and level of occupational hazards of computer operators in public universities in Rivers State**

| Items | Level of occupational hazards control needs | | Total Freq % | Df | $X^2$-value | p-value | Decision |
|---|---|---|---|---|---|---|---|
| | High Freq % | Low Freq % | | | | | |
| **Training** | | | | | | | |
| Yes | 242(87.7) | 34(12.3) | 276(100) | 1 | 175.588 | 0.000 | Rejected |
| No | 33(22.9) | 111(77.1) | 144(100) | | | | |
| Total | 275(65.5) | 145(34.5) | 420(100) | | | | |

*Statistical significant ($p<0.05$)

The finding of the study showed that there is significant relationship between training and level of occupational hazards of computer operators in public universities in Rivers State ($X^2$–value = 175.588; df = 1, $p<0.05$). Therefore, the null hypothesis which states that there was no significant relationship between training and level of occupational hazards of computer operators in public universities in Rivers State was rejected.

## DISCUSSIONS

The study revealed that a majority of the population faced high ergonomic hazards, particularly among computer operators. This association is unsurprising, given that computer operation involves activities linked to musculoskeletal problems. Similar findings were reported by Bachelet et al (2018) and Rafact et al (2002), emphasizing the connection between ergonomic hazards and computer operators. The prolonged sitting associated with computer use can lead to issues such as back and waist pains, especially among business users, necessitating a need to reevaluate the sitting positions of computer operators to align with users' musculoskeletal structure.

Additionally, the study found that a significant portion of the population experienced high psychosocial hazards, indicating an association between psychosocial issues and computer operators. This aligns with findings from Agbana et al (2016) and Calik et al (2020), highlighting psychosocial problems faced by computer operators, often stemming from customer interactions. Poor human relations, abuse from colleagues and customers, pressure related to work, especially in school environments, and work overload contribute to psychological issues among computer operators. Therefore, maintaining a sound mind is crucial for effective work. Furthermore, the study demonstrated that factors such as age, education, working experience, and training contribute to the level of occupational hazards among computer operators. These factors help operators manage and prevent occupational hazards, as age brings maturity, education provides knowledge on coping strategies, work experience offers risk prevention strategies, and training ensures effective execution of duties. These findings are consistent with studies by Adebola (2014), Kalashasthi et al (2012), and Malinska et al (2021), collectively indicating that age, education, working experience, and training play significant roles in determining the level of occupational hazards among computer operators. the study highlighted good control needs among computer operators in public universities. This aligns with the findings of Levanon et al (2012) and Agbana et al (2016), emphasizing the importance of control measures among computer operators. Adebola (2014) also reported that participants adopted safety measures, such as maintaining proper sitting positions and using materials to reduce eyestrain, showcasing an awareness of safety practices among computer operators. This positive control environment may be attributed to factors like age, education, working experience, and training.

## CONCLUSION

Based on the findings of the study, it was concluded that computer operators was associated with various levels of occupational hazards. The study further concluded that socio-demographic characteristics such

as age, education, training and work experience contributes to their control needs. Hence, there is need to carry out educative programmes amongst computer operators.

## RECOMMENDATIONS

Based on the study's findings, the following recommendations are suggested:

1. Regular awareness and educative programmes should be directed to computer operators in the University campuses by relevant stake holders and management in the control of occupational hazards associated with their work.
2. Health Education, sensitization and awareness should be organized by Ministry of Health other stake holders to those running computer operators in the university campuses since they are very busy with their business almost every in other to prevent and cope with risk associated with their job.
3. Refresher courses should be organized by the government through the mass media in updating the knowledge of computer operators in the prevention of occupational hazards.
4. Computer operators should be encouraged to attend events and workshops on how best to use PPE and other measures to prevent hazards in the work place.

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