

# Safety Awareness among Display Screen Equipment Operators in Tertiary Institutions in Rivers State

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## ABSTRACT

The purpose of the study was to investigate safety awareness among display screen equipment operators in tertiary institutions in Rivers state. This study adopted a descriptive research design. A sample of 333 respondents were selected from a population of 934 display screen equipment operators in Tertiary institutions in Rivers State through a multistage sampling procedure. A validated self-structured instrument titled “Safety Awareness Questionnaire” with a reliability index of 0.88 was used to collect data for the study. Data collected were analyzed using SPSS version 26.0. The statistical tools employed include: Percentage and Chi Square. The findings revealed that: The display screen equipment operators were highly aware of the OHS hazards inherent in their work environment (87.47%); and there was a significant difference in the level of awareness of OHS hazard among the display screen equipment operators based on level of education ( $P < 0.05$ ), but not significantly different based on work experience and gender ( $P > 0.05$ ). It was concluded that: the display screen equipment operator practices were highly aware of the occupational health and safety hazards inherent in their work environment. Based on the findings of this study, it was recommended that health education experts should collaborate with government and non-government agents to provide health education interventions tailored to address level of awareness of different demographic groups of the display screen equipment operators, particularly focusing on gender and work experience.

**Keywords:** Safety Awareness, Display Screen Equipment Operators

## INTRODUCTION

Every job comes with its own set of intrinsic risks to employees' health and safety, which they must always be prepared to address. While some workers have the resources necessary to deal with the dangers, others have been left in ruins as a result of the fallout from these dangers and are desperately searching for a way out. The patterns that have been observed in academic writing about workers' health point to the undeniable fact that a great number of workers are having difficulties with their wellbeing. This supports the concept that the health of workers is not a primary concern in a great number of countries. As a consequence of this, the World Health Organization (WHO, 2012) estimated that occupational exposure contributes to 40% of the global disease burden. Annually, there are thousands of non-fatal occupational injuries, affecting an estimated 374 million workers (Hämäläinen, Takala, & Kait, 2017). Additionally, over two million people worldwide are estimated to die each year from occupational injuries and work-related diseases (Denge & Rakhudu, 2022). As a result, the World Health Organization (WHO, 2013) documented that more than three billion people in the world have daily occupational health

There has been an incredible increase in the demand for and use of display screen equipment (DSE) in the workplace in Nigeria and around the world for more than a decade now. This trend can also be seen in other parts of the world. According to Sulby (2021), display screen equipment refers to any piece of machinery that contains a display screen and can show either text, numbers, characters, or images. This definition applies regardless of the type of display technology being utilized. Therefore, the working instruments that display images and characters on the screen are included in the definition of display screen equipment. A few examples of them include the telephone, the television, and the computer. On the other hand, display screen equipment could be thought of as a group of items (chair, computer, table, printer, mouse, and keyboard) that are used to

process data and output information inside an office setting. According to the occupational safety and health regulation on display screen equipment that was passed in 2009, a display screen equipment work station is comprised of the display screen equipment, chair, desk, work surface, printer including the working environment and other items related to the display screen equipment, such as the mouse, keyboard, printer, Central Processing Unit (CPU), and soon. This regulation was passed in 2009.

The display screen equipment is a technological innovation that has made work easier and created speedier means of obtaining higher work output. Additionally, this innovation has paved the way for more new employment responsibilities, which has resulted in various ramifications for workers' health and productivity (Ekenedo & Jonathan, 2016). Unfortunately, display screen equipment operators have been neglected in their places of employment, which has had a negative impact on their overall well-being.

The use of display screen equipment can lead to a number of health problems, the majority of which are the result of improper use or use that is carried out in an erroneous manner for an extended period of time. The Trade Union Congress (TUC) released a report in 2013 stating that the health risks associated with display screen equipment were among the top five, with display screen equipment being in second place. It is also common knowledge that the majority of companies and businesses rely heavily on display screen equipment to grow their businesses. This is true across a wide variety of industries, including education, entertainment, telecommunications, and business centers located in almost every part of the world. These users are subjected to a number of dangers that put their health in jeopardy, particularly in Nigeria, where there are no explicit laws or regulations governing the use of display screen equipment. As a result, these users are exposed to a variety of risks that put their health in jeopardy. The majority of these health problems could be attributed to a lack of awareness of the incalculable risks associated with the usage of display screen equipment (Ekenedo & Jonathan, 2016).

Internationally, the use of DSE has been linked to a range of health issues, including musculoskeletal disorders, eye strain, and mental stress. The World Health Organization (WHO) has emphasized the importance of ergonomic practices and regular breaks to prevent such conditions (WHO, 2021). A study conducted by Bergqvist et al. (2020) in Sweden found that 68% of DSE operators reported experiencing discomfort in their neck and shoulders, highlighting the need for comprehensive safety training and ergonomic interventions. Similarly, in the United Kingdom, a survey by the Health and Safety Executive (HSE) revealed that a significant proportion of DSE operators were unaware of the correct posture and workstation setup required to prevent health problems (HSE, 2018).

The vast majority of firms located on university campuses, such as those that sell display screen equipment and business centers, have less than seven employees. In Nigeria, the situation mirrors global trends, albeit with additional challenges related to infrastructural deficits and limited access to health and safety resources. A study by Okechukwu et al. (2019) in Lagos State revealed that only 45% of DSE operators had received formal training on the safe use of DSE, and even fewer had access to ergonomically designed workstations. This gap in safety awareness contributes to the prevalence of work-related health issues among Nigerian DSE.

In Rivers State, the focus of this study, tertiary institutions are grappling with similar issues. Research by Nwankwo and Nkang (2022) highlighted that a substantial number of DSE operators in Rivers State universities reported frequent back pain and eye strain, conditions exacerbated by prolonged hours at poorly designed workstations. The study also noted a critical lack of institutional policies and training programs aimed at improving DSE safety awareness. Enhancing safety awareness among DSE operators is essential not only for the well-being of the operators themselves but also for the overall productivity and efficiency of educational institutions. Safety training programs, ergonomic assessments, and regular health check-ups are key components of a comprehensive approach to managing the risks associated with DSE use. Institutions that invest in these measures can expect reduced absenteeism, lower healthcare costs, and improved employee morale (Smith & Carayon, 2016).

The business centers on university campuses typically have limited resources, substantial amounts of work, and various responsibilities assigned to each employee. The workplace is typically an atmosphere that does not always live up to the standards that are expected of it. Small-scale businesses, such as home industries, small

farms, and cottage industries, are common in developing nations like Nigeria. In these types of businesses, family members of the entrepreneurs and workers, including children, pregnant women, and elderly people, share the work. It is estimated that two-thirds of workers around the world are still employed in conditions that do not satisfy the minimal requirements established by the International Labour Organization (ILO).

It has been stated numerous times that human behavior is frequently modified or influenced by social, economic, and demographic factors such as education, income/resources, political structure, experience, gender, and a variety of other factors. This is something that has been emphasized on a number of occasions. In a similar vein, one might also make the same argument regarding the standards of health and safety observed in the workplace by DSE operators (Mwawasi, 2012). However, there is still an ongoing debate regarding to what extent and how these variables are associated or related to the implementation of Occupational Health and Safety Management System (OHS-MS) among DSE operators, as well as the extent to which they determine hazard exposure and the adoption of hazard control strategies. This debate has been going on for quite some time.

One of the many individual characteristics that can contribute to occupational damage is a person's gender. Gender can play a significant role in influencing the safety awareness levels of DSE operators. Research has shown that women are more likely to report higher levels of discomfort and musculoskeletal issues related to DSE use than men. For example, a study by Marcus and Gerr (2015) found that female DSE operators reported higher levels of neck and shoulder pain compared to their male counterparts. This difference could be attributed to variations in body size, muscle strength, and ergonomic factors, which may necessitate tailored safety interventions for different genders.

Work experience is another critical demographic variable that can impact safety awareness among DSE operators. Experienced operators are likely to have developed coping mechanisms and awareness of the risks associated with prolonged DSE use. However, they might also be more complacent, relying on outdated practices rather than adhering to updated safety guidelines. Conversely, newer employees might lack practical experience but could benefit from recent training on DSE safety. Studies like those by Robertson et al. (2017) emphasize the importance of continuous training and updating safety protocols to ensure that both experienced and inexperienced operators maintain high safety awareness levels.

The level of education can significantly influence the safety awareness of DSE operators. Higher educational attainment is generally associated with better awareness and understanding of occupational health and safety issues. Educated operators are more likely to be aware of ergonomic principles and the importance of regular breaks, proper posture, and workstation adjustments. A study by Ehsan et al. (2018) indicated that individuals with higher educational qualifications demonstrated better compliance with DSE safety practices, underscoring the need for educational programs to enhance safety awareness among operators with varying educational backgrounds.

The Health Belief Model, developed in the 1950s by social psychologists at the U.S. Public Health Service, is a model that can provide valuable insights into safety awareness among Display Screen Equipment (DSE) operators. It will relate to their awareness of the risk of developing health issues such as musculoskeletal disorders, eye strain, and mental stress from prolonged DSE use. The model will also throw more light on the operators' awareness of the severity of these health issues

Display screen equipment users' health concerns have been overlooked in general, owing to their subjective nature, a lack of clinical tests, and the invisibility of pain and discomfort. Alongside the ill attention given to display screen equipment operators by a paucity of studies, the few studies conducted focused on the health problems associated with display screen equipment (Ekenedo & Jonathan, 2016; Joshi, Karki & Sharma, 2015; Jideonwo 2019). None of these study assessed the level of awareness of occupational health and safety practices of display screen equipment in tertiary institutions. It is this gap in literature that the present study is designed to fill. Thus this study investigated the current level of safety awareness among DSE operators in tertiary institutions in Rivers State, identify gaps in knowledge and practice, and recommend strategies for improvement.

## Research Questions

The following research questions were raised and answered to guide the study:

1. What is the level of awareness of OHS among display screen equipment operators?
2. What is the difference in the level of awareness of OHS among display screen equipment operators based on education status?
3. What is the difference in the level of awareness of OHS among display screen equipment operators based on work experience?
4. What is the difference in the level of awareness of OHS among the Display screen equipment operators in tertiary institutions in Rivers state based on gender?

## Hypotheses

The following hypotheses were postulate and tested at .05 level of significance

1. There is no significant difference in the level of awareness of OHS among display screen equipment operators based on educational status.
2. There is no significant difference in the level of awareness of OHS among display screen equipment operators based on work experience.
3. There is no significant difference in the level of awareness of OHS among display screen equipment operators based on gender.

## METHODOLOGY

This study adopted a descriptive survey design. The sample size for the study was 333 Display Screen Equipment operators drawn from the population of 934 display screen equipment operators in tertiary institutions in Rivers State (National Students Union Government, 2020). The sample size was selected using two sampling procedures involving proportionate stratified random sampling, and purposive sampling technique. Proportionate sampling technique was used to draw 35.7% of the population of computer operators in each of the five major tertiary institutions in Rivers State. Purposive sampling technic was used to draw the actual participants. The criterion for sampling will include: must have an office, must be functional, must have been operational for at least one year and must be located within the school campus.

The instrument for data collection was a validated self-structured questionnaire titled “Safety Awareness Questionnaire (SAQ)” with a reliability index of 0.88. The instrument was divided into two sections (section A and B). Section “A” gathered information about the respondents’ demography while section B gathered information necessary to address the research questions and hypotheses. The section B was designed such that Yes or No item statement was used to elicit data for safety awareness. The data for the study were collected through the administration of the instrument on 333 respondents drawn from the tertiary institutions. This was done by the researcher with the help of two trained research assistants. For ethical reasons, an introductory letter was obtained from the Head of Department and sent the Business Operators Union Chairman for pre-information and permission to conduct the study.

The completed copies of the questionnaire were collated, coded and analyzed using the statistical package of social sciences (SPSS) version 26. Descriptive statistics of percentages was adopted to answer the demographic data and research questions respectively. While inferential statistics of Chi-square was used to test the hypotheses at 0.05 alpha.

## RESULTS

Table 1: Summary of Demographic Characteristic of Respondents

Demographic	Groups	f	%
Gender	Male	155	46.5
	Female	178	53.5
	<b>Total</b>	<b>333</b>	<b>100.0</b>

<b>Highest Educational Status</b>	No formal education	10	3.0
	Primary	81	24.3
	Secondary	162	48.6
	Tertiary	80	24.0
	<b>Total</b>	<b>333</b>	<b>100.0</b>
<b>Years of Experience</b>	1-9 years	239	71.8
	10-19	91	27.3
	20 and above	3	.9
	<b>Total</b>	<b>333</b>	<b>100.0</b>

Results in Table 1 showed that majority of the respondents were female (53.5%) while 46.5% were male. Hence the display screen users were mostly females. Education wise, 48.6% of the respondents had secondary education, 24.3% had primary education, 24.0% had tertiary education and 3.0% had no formal education. In relation to working experience, a good number of the respondents (71.8%) had 1-9 years of working experience, 27.3% had 10-19 years of working experience and 0.9% had 20 years working experience and more.

Table 2: Analysis of the level of awareness of OHS among display screen equipment operators.

S/No		True		false		Remark
		f	%	f	%	
1	Looking at the screen for a long time poses the risk of eye problems	325	97.6	8	2.4	High
2	Sitting in one place for a long time poses the risk of musculoskeletal problems	312	93.7	21	6.3	High
3	Physical attack by clients pose the threat of injury	305	91.6	28	8.4	High
4	Poor lightening of workstation may constitute trips and vision problems	317	95.2	16	4.8	High
5	Prolonged use of mouse and keyboard poses the risk of upper arm problems	262	78.7	71	21.3	High
6	Dust particles from papers and printing machines poses risks the respiratory system problems	295	88.6	38	11.4	High
7	Radiation from computer hardware and printers especially old ones leads to skin problems	269	80.8	64	19.2	High
8	Inadequate spacing and poor housekeeping can cause trips and falls	273	82.0	60	18.0	High
9	Poorly ventilated workstation poses the risk of suffocation and high body temperature	285	85.6	48	14.4	High
10	Heat emission from computer and printers posed the risk of skin problems, asphyxia, and meningitis	263	79.0	70	21.0	High
11	Noise from faulty equipment poses the risk of hearing impairment and poor concentration	300	90.1	33	9.9	High



12	Poorly insulated electrical power cables pose the risk of electrical shock	297	89.2	36	10.8	High
13	Verbal abuse from clients pose the risk of emotional imbalance	283	85.0	50	15.0	High
	<b>Aggregate</b>	<b>291</b>	<b>87.47</b>	<b>42</b>	<b>12.53</b>	<b>High</b>

Results in Table 2 showed that the display screen workers in tertiary institutions in Rivers state had high level of awareness of the health hazards associated with display screen equipment (87.47%). Hence, the Display screen workers were aware of the physical, chemical, ergonomic and biological hazards associated with working with display screens.

Table 3: Summary of Chi Square analysis of the level of awareness of OHS among display screen equipment operators based on educational status

	$\chi^2_{cal}$	df	$\chi^2_{crit}$	P.Val	Decision
Education*awareness of OHS	9.78	3	7.81	.006	Significant H <sub>0</sub> rejected

\*P<0.05;  $\chi^2_{cal} > \chi^2_{crit}$

Table 3 revealed that the  $\chi^2_{cal}$  was 9.78,  $\chi^2_{crit}$  was 7.81 and P.val of 0.006 at the df of 3. From the analysis, the P<0.05;  $\chi^2_{cal} > \chi^2_{crit}$ , hence, there is a significant difference in in the level of awareness of OHS among display screen equipment operators based on educational status. Therefore, the stated null hypothesis was rejected and the alternative hypothesis was accepted. This means that computer operators' highest level of education affects the computer operators' level of OHS awareness.

Table 4: Summary of Chi Square of level of awareness of OHS among display screen equipment operators based on work experience.

	$\chi^2_{cal}$	df	$\chi^2_{crit}$	P.Val	decision
Experience*awareness of OHS	1.36	2	5.99	0.508	Not significant H <sub>0</sub> accepted

\*P>0.05;  $\chi^2_{cal} < \chi^2_{crit}$

Table 4 showed that the  $\chi^2_{cal}$  was 1.36,  $\chi^2_{crit}$  was 5.99 and P.val of 0.508 at the df of 2. From the analysis, the P>0.05;  $\chi^2_{cal} < \chi^2_{crit}$ , hence, there is no significant difference in in the level of awareness of OHS among display screen equipment operators based on work experience. Therefore, the stated null hypothesis was accepted and the alternative hypothesis was rejected. This implies that computer operators' working experience affects the computer operators' level of OHS awareness.

Table 5: Summary of Chi Square of the level of awareness of OHS among display screen equipment operators based on gender

	$\chi^2_{cal}$	df	$\chi^2_{crit}$	P.Val	Decision
Gender*awareness of OHS	0.263	1	3.84	0.608	Not significant H <sub>0</sub> Accepted

\*P>0.05;  $\chi^2_{cal} < \chi^2_{crit}$

Table 5 revealed that the  $\chi^2_{cal}$  was 0.262,  $\chi^2_{crit}$  was 3.84 and P.val of 0.608 at the df of 1. From the analysis, the  $P > 0.05$ ;  $\chi^2_{cal} < \chi^2_{crit}$ , hence, there is no significant difference in the level of awareness of OHS among display screen equipment operators based on gender. Therefore, the stated null hypothesis was accepted and the alternative hypothesis was rejected. This implies that computer operators' working experience affects the computer operators' level of OHS awareness.

## DISCUSSION

In general, awareness refers to being informed of something and being aware of it; it also refers to being mindful of something and being awake of it. The condition or capacity to notice, feel, or be sentient of events, objects, or sensory patterns is known as awareness. Sense data can be validated by an observer at this level of consciousness without necessarily suggesting cognition. Any knowledge holder must have consciousness, yet simply awareness does not imply any form of knowledge. It is the condition or characteristic of being aware of something in a broader sense. The first objectives of this exploration was to establish the level of awareness of OHS hazards among display screen equipment workers. The result the analysis was reported in table 4.2.

The result in table 4.2 disclosed that the display screen workers in tertiary institutions in Rivers state had high level of awareness of the health hazards associated with display screen equipment (87.47%). Hence, the Display screen workers were aware of the physical, chemical, Ergonomic and biological hazards associated with working with display screens. The display screen equipment operators were highly aware of the OHS hazards inherent in their work environment (87.47%).

The above affirmation is consistent with several studies. Gebrezgabher, Tetenke and Yekum (2013) found that most display screen operators (51%) were aware of the hazards inherent their work environment. Mohammed et'al. (2014) also found that over 60% of the display screen operators in tertiary universities in Pakistan were aware of hazards associated with prolonged use of display screen equipment. Furthermore, Aluko et'al. (2016) found that 89% of the healthcare administrative workers that uses display screen equipment were aware of the health dangers of constant utilization of display screen equipment.

However, in 1998 Hu, Lee, Shiao and Guo recorded a contradictory result. They found that the most workers 67% were not aware of the health hazards and the hazard minimization measures. The incongruent results could as a result of poor sensitization and awareness creation on OHS then as OHS was somewhat in its infant state as the time of Hu et'al (1998) study.

There was a significant difference in the level of awareness of OHS hazard among the display screen equipment operators based on level of education ( $P < 0.05$ ). But there was not significantly different based on work experience and gender. The result of studies from, India (Kumar, Dharanipriya, Kar, 2013), and Zambia (Gambo, 2015) are in support to our findings where we found educated workers were more aware of occupational hazards.

In opposition to the above results, Marahatta et'al (2018), in their study, level of education and gender had no significant influence on level of awareness of OHS hazards among DSE operators. Hence, in their study both male and female had similar level of awareness of OHS hazards. However, both studies agreed that work experience does not influence awareness of OHS hazards among DSE operators.

## CONCLUSION

Based on the findings of this study, it was concluded that the display screen equipment operator practices were highly aware of the occupational health and safety hazards inherent in their work environment. However, gender and work experience had no influence on the level of awareness of OHS hazards but educational status does.

## RECOMMENDATIONS

Based on the findings of this study, it was recommended that health education experts should collaborate with government and non-government agents to provide health education interventions tailored to address level of awareness of different demographic groups of the display screen equipment operators, particularly focusing on

gender and work experience.

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