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SAFETY PRACTICES TO MITIGATE OCCUPATIONAL HAZARDS AND SOCIO-DEMOGRAPHIC CORRELATES AMONG GRAPHIC DESIGNERS IN RIVER STATE

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ABSTRACT: Safety practice must be prioritized because occupational hazards in computer graphic designing work can have a significant impact on the health and well-being of workers. This study investigated safety practices to mitigate occupational hazards and socio-demographic correlates among graphic designers in Rivers State. The sample size of study 360 was determined using Cochran's formula. Multi-stage sampling procedure was adopted for the study which was presented in three stages to select the sample for the study. The instrument for eliciting information for this study was self-administered questionnaire titled Safety Practice and Socio-Demographic Correlates Questionnaire (SPSdCQ). The reliability coefficient of the instrument was 0.8. Collected data were coded and analyzed with the aid of the Statistical Package for Service Solution (version 25.0) using percentage and Pearson Correlation at 0.05 level significance. Results indicated that, the grand mean of 3.11±0.71 is greater than the criterion mean of 2.50, indicating a good safety practice. Thus, the safety behaviours to mitigate occupational hazards among graphic designers in Rivers State was good with majority indicating that they often use cover all during graphic work on

objects (3.64±0.97). The result indicated that there was a significant relationship demographic factors (age (N = 360; r = 0.72; p<0.05), work experience (N = 360; r = 0.62; p<0.05) and educational level (N = 360; r = 0.70; p<0.05). The result indicated that there was a significant relationship (N = 360; r = 0.40; p<0.05). It was concluded that graphic designers had good safety practice and the socio-demographic correlates are age, years of work experience and educational level. It was recommended among others that professionals graphic design association should advocate government policies that protect freelance and informal sector designers, including access to health insurance, launch awareness campaigns and establish cooperatives purchasing systems to help members acquire PPE at reduced cost.

Keywords: *Correlates, Demographics, Graphic Design, Practice, Safety.*

Introduction

Graphic design is one of the most in-demand professions with significant job, opportunities as it allows leveraging technological advancements and working online from anywhere in the World. Occupational hazards in computer graphic designing work can have a significant impact on the health and well-being of workers. According to a study by Jadhav and Helonde (2016), long hours sitting in front of a computer screen can lead to musculoskeletal disorders such as neck and back pain, repetitive strain injuries, and eye strain. This can be exacerbated by poor ergonomic design of workstations and improper posture while working. Furthermore, exposure to hazardous chemicals in the printing process, such as volatile organic compounds from inks and solvents, can pose a risk to the respiratory system and overall health of workers (Nesami et al., 2016). In addition, prolonged exposure to high levels of noise from printing equipment can lead to hearing loss and other auditory problems (Korhonen et al., 2013). In graphic designing, designed materials are printed and during the process of printing the materials workers are exposed to hazards. Overall, it is important for employers in the graphic design industry to implement proper safety measures and provide training on ergonomic practices to reduce the risk of occupational hazards among workers.

Safety behaviours are important for graphic designers to mitigate occupational hazards and ensure a safe work environment. One key safety behaviour is

maintaining proper ergonomics while working at a computer. This includes sitting with proper posture, adjusting the height of the chair and monitor, and taking breaks to avoid repetitive strain injuries (Pikaar, 2011). Another important safety behaviour for graphic designers is using proper equipment and tools for the job. This can include using ergonomic keyboards and mice to reduce strain on the wrists, as well as ensuring that computer monitors are positioned at the correct angle to reduce eye strain (Kroemer, 2016). Additionally, it is essential for graphic designers to take regular breaks and stretch to prevent muscle fatigue and discomfort. By incorporating these safety behaviours into their daily routine, graphic designers can reduce the risk of developing work-related injuries and maintain their overall health and well-being (Marji, 2014). Safety behaviours such as maintaining proper ergonomics, using appropriate equipment, and taking regular breaks are essential for graphic designers to mitigate occupational hazards and create a safe work environment. By implementing these practices, graphic designers can protect themselves from injury and ensure their long-term health and productivity.

Training is another form of education that enable graphic designers to understand and be aware of safety practices. Graphic designers who are well trained may likely know about safety practices and could comply strictly to reduce the risk of accidents and injury. Ashuro et al. (2021) added that lack of occupational safety training are 2.4 times more likely for the occurrence of work-related injury and accidents. Alao et al. (2020) illustrated that training is significantly associated with the use of protective and safety devices during painting activities. Alemu, et al, (2020) reported that lack of utilization of safety protective devices were due to poor knowledge and awareness traceable to absence of orientation. Also, Alemu et al. (2020) depicted that the presence of training on how to use personal protective equipment were about 5 times to adequately utilize it, while presence of safety training are 2.8 times more likely to comply with safety practices. Graphic designers who use safety training and devices may be less exposed to any forms of occupational hazards which may improve and promote good health and safety status. Sehsah et al. (2020) buttressed that the use of safety devices and practices are 2.4 times more likely to predict accident and hazards prevention, the prevalence of occupational hazards depends on the safety training.

It was noticed that one of the most dangerous occupations is graphic design were workers are expose to hazards leading accidents, falls from height, musculoskeletal disorders, inhalation of fumes, skin irritation and other occupational diseases among others. It is essential that graphic designers should observe regular break and stretch to prevent muscle fatigue and discomfort. Non-adherence with safety practice exposes graphic designers to different forms of hazards that pose health threat. Graphic designers spend long hours of siting, pressure from meeting clients' deadlines and view digital screen with a resultant effects of poor posture, musculoskeletal disorders, burnout, anxiety and stress among others that affect their health status. Physical problems traceable to exposure to vibration from design printing machine and other computer device constitute occupational risk to graphic designer. The nature of graphic designing exposes workers to inhalation of toxic chemicals and fume, poor positioning, dusts from computer toner among others leading to several forms of occupational health problems such as musculoskeletal disorders, respiratory disorders, skin irritation, injury, and stress. Hence, the need for safety practice. This study therefore investigated the safety practices to mitigate occupational hazards and socio-demographic correlates among graphic designers in Rivers State. The study provided answers to the following research questions:

1. What are the safety practices to mitigate occupational hazards among graphic designers in Rivers State?
2. What are the demographic factors (such as age, work experience, educational level) on occupational hazards and safety practices graphic designers in Rivers State?
3. What is the relationship between safety practices (such as use of PPE, adherence to safety protocols) and occupational hazards among graphic designers in Rivers State?

Hypotheses

In regards to this study, the following hypotheses were postulated and tested at 0.5 level of significance.

1. There is no significant relationship between demographic factors (such as age, work experience, educational level) on occupational hazards and safety practices graphic designers in Rivers State.
2. There is no significant relationship between safety behaviours (such as use of PPE, adherence to safety protocols) and occupational hazards among graphic designers in Rivers State.

Methodology

The area of this study was Rivers State, Nigeria. A descriptive cross sectional survey design was adopted with a population of the study comprised of all graphic designers in Rivers State. The sample size for the study was 360 which as determined using the Cochran Formula given thus: $n = p(1-p)z^2 / e^2$; where n = sample size, p = the statistical power (0.80), e = acceptable sampling error (e=0.05) and z = confidence interval at 95% given as 1.96. Adding 10% attrition rate, n = 360. The multi-stage sampling procedure was adopted for the study. At the first stage, the simple random sampling technique was used to select three Local Government Areas from each senatorial district. At the second stage, the purposive sampling technique was adopted selected graphic designers at different location. The instrument for data collection was a self-administered questionnaire titled 'Safety Practice and Socio-Demographic Correlates among Graphic Designers (SPSDCGD)'. The instrument was validated by experts and the reliability index was 0.81. Collected data were coded and analyzed using Statistical Package for Service Solution (SPSS) version 25.0). The result was obtained by using descriptive statistical tools such as percentage, and frequency while Pearson Product Moment Correlation (PPMC) was used to test the hypotheses at 0.05 level of significance.

Results

The results of the study are shown below:

Table 1: Safety practices among graphic designers in Rivers State

S/N	Items	Mean	SD
1	How often do you use eye goggles during manual designing?	2.59	1.06
	How often do you wear hand gloves while handling or mixing	3.16	0.61

	designing materials?		
3	How often do you cover all during graphic work on objects?	3.64	0.97
4	How often do you wear nose mask while using toxic/emulsion paint for designing?	2.88	0.49
5	How often do you wear safety shoes when working at workshop?	3.61	0.48
6	How often do you wear face shield during spray designing?	3.11	0.32
7	How often do you use reflectors at workplace?	2.72	0.92
8	How often do you wash your hand with soap and water after painting and designing?	3.18	0.86
	Grand total	**3.11**	**0.71**

Criterion mean = 2.50

Table 1 showed the safety behaviours to mitigate occupational hazards among graphic designers in Rivers State. The result showed that, the grand mean of 3.11±0.71 is greater than the criterion mean of 2.50, indicating a good safety behaviours. Thus, the safety behaviours to mitigate occupational hazards among graphic designers in Rivers State was good with majority indicating that they often use cover all during graphic work on objects (3.64±0.97).

Table 2: Pearson Correlation showing the impact of demographic factors (such as age, work experience, educational level) and occupational hazards and safety practices among graphic designers in Rivers State

Variables		**Occupational hazards**	**Age**	**Remarks**
Occupational hazards	Correlation	1	0.72	H_o rejected
	N	360	360	
Age	Correlation	0.72	1	
	N	360	360	
		Occupational hazards	**Work experience**	
Occupational hazards	Correlation	1	0.62	H_o rejected
	N	360	360	

Work experience	Correlation	0.62	1	
	N	360	360	
		Occupational hazards	**Educational level**	
Occupational hazards	Correlation	1	0.70	H_o rejected
	N	360	360	
Educational level	Correlation	0.70	1	
	N	360	360	

Guide: 0.00-0.19 = very low, 0.20-0.39 = low, 0.40-0.59 = moderate, 0.60-0.79 = high and 0.80 above is very high correlation

Table 2 showed the Pearson Correlation between demographic factors (such as age, work experience, educational level) and occupational hazards and safety practices among graphic designers in Rivers State. The result revealed a correlation coefficient of r = 0.40, r = 62 and r = 70 indicating a high correlation for age, work experience and educational level. Thus, the correlation between demographic factors such as age, work experience, and educational level was moderate.

Table 3: Pearson Correlation of relationship between safety behaviours (such as use of PPE, adherence to safety protocols and safety behaviours among graphic designers in Rivers State

Variables		Occupational hazards	Safety behaviours	Remarks
Occupational hazards	Correlation	1	0.40	Moderate
	N	360	360	
Safety behaviours	Correlation	0.40	1	
	N	360	360	

Guide: 0.00-0.19 = very low, 0.20-0.39 = low, 0.40-0.59 = moderate, 0.60-0.79 = high and 0.80 above is very high correlation

Table 3 showed the Pearson Correlation between safety behaviours (such as use of PPE, adherence to safety protocols) and safety behaviours among graphic designers in Rivers State. The result revealed a correlation coefficient of r = 0.40 indicating a moderate correlation. Thus, the correlation between safety behaviours (such as use of

PPE, adherence to safety protocols) and safety behaviours among graphic designers in Rivers State was moderate.

Test of Hypotheses

Hypothesis 4: There is significant relationship between demographic factors (such as age, work experience and educational level)and occupational hazards among graphic designers in Rivers State?

Table 4: Pearson Correlation of relationship between demographic factors (such as age, work experience and educational level) and occupational hazards among graphic designers in Rivers State

Variables		**Occupational hazards**	**Age**	**Decision**
Occupational hazards	Correlation	1	0.72 0.00*	H_o rejected
	N	360	360	
Age	Correlation	0.72 0.00*	1	
	N	360	360	
		Occupational hazards	**Work experience**	
Occupational hazards	Correlation	1	0.62 0.00*	H_o rejected
	N	360	360	
Work experience	Correlation	0.62 0.00*	1	
	N	360	360	
		Occupational hazards	**Educational level**	
Occupational hazards	Correlation	1	0.70 0.00*	H_o rejected
	N	360	360	
Educational level	Correlation	0.70 0.00*	1	
	N	360	360	

*Significant; $p<0.05$

Table 4 showed the Pearson Correlation of significant relationship between demographic factors (such as age, work experience and educational level) and occupational hazards among graphic designers in Rivers State. The result indicated that there was a significant relationship demographic factors (age (N = 360; r = 0.72; $p<0.05$), work experience (N = 360; r = 0.62; $p<0.05$) and educational level (N = 360; r = 0.70; $p<0.05$). Thus, the null hypothesis which stated that there was no significant relationship between demographic factors (such as age, work experience and educational level) and occupational hazards among graphic designers in Rivers State was rejected.

Table 5: Pearson Correlation of relationship between safety behaviours and occupational hazards among graphic designers in Rivers State

Variables		**Occupational hazards**	**Safety behaviours**	**Decision**
Occupational hazards	Correlation	1	0.40 0.00*	H_o rejected
	N	360	360	
Safety behaviours	Correlation	0.40 0.00*	1	
	N	360	360	

*Significant; $p<0.05$

Table 5 showed the Pearson Correlation of significant relationship between safety behaviours and occupational hazards among graphic designers in Rivers State. The result indicated that there was a significant relationship (N = 360; r = 0.40; $p<0.05$). Thus, the null hypothesis which stated that there was no significant relationship between safety behaviours and occupational hazards among graphic designers in Rivers State was rejected.

Discussion of Findings

The findings of the study were discussed below:

The result indicated that there was a significant relationship demographic factors (age (N = 360; r = 0.72; p<0.05), work experience (N = 360; r = 0.62; p<0.05) and educational level (N = 360; r = 0.70; p<0.05). Thus, the null hypothesis which stated that there was no significant relationship between demographic factors (such as age, work experience and educational level) and occupational hazards among graphic designers in Rivers State was rejected. Ojo et al. (2020) reported that graphic designer below age 20 years were likely to exhibit poor safety behaviours which was significantly associated with high occupational hazards exposure. Pandey and Kiran (2023) added that respondents who faced high respiratory issues belong to the age group of 61 to 75 years, and minimum problems were observed in the age group of 19 to 32 years and age was statistically significant with occupational health problems traceable to hazards exposure. Also, this implies that an experienced graphic designer may understand how to minimize hazards in the workplace through developing positive safety behaviours. The result of this study is in credence with findings of Kassy et al. (2021) which indicated that workers with several years of experience and prolong working duration are 4.3 times more likely to suffer for occupational hazards if safety practice are not considered. Ojo et al. (2020) added that graphic designers with over 5 years of experience understand the use if safety or protective devices to prevent danger. Pandey and Kiran (2023) affirmed that there was a positive and significant association between discomfort during breathing and working years (.340), working days in a week (.195), and working duration (.594). Awodele et al. (2014) and Reeb-Whitaker et al. (2013) whose studies identified that work experience showed over 3 times more likely to improve safety practice and minimize workplace hazards especially in the painting and designing industry. Kumar et al. (2013) agreed that good proportion of workers with over 5 years of experience (83.7%) complied with safety precautions and predict increase in danger awareness unlike the inexperienced designers (p=0.05). Monney et al. (2014) affirmed that work experience (P = 0.203) was statistically significant with safety practices among workers in all occupation.

The result of this study indicated that educational status of graphic designers plays a significant role in developing positive safety behaviours such as understanding the use of safety devices, work at limited times among others. Studies of Agbana et al.

(2012) indicated that workers who received tertiary level of education possessed high knowledge of occupational hazard preventive practices such as developing safety behaviours. Another study carried out in Nigeria, Oche et al. (2020) indicated worker in designing industry or firms are more likely to faced work-related hazards both educated non-educated workers whereas uneducated workers are severely exposed to different hazards. Education either through training enable graphic designers to be aware of occupational hazards and understand the steps to be taken to ameliorate the presence of hazards through use of protective devices and compliance with safety rules or standards. Prior studies of Ogunnowo et al. (2010) added that uneducated workers are more likely to be exposed to different forms of occupational hazards unlike the educated graphic designers. It is plausible that work experience creates the tendency for quality job performance and service delivery. As at the time of this study, there were studies that contradict with outcome of this findings. Hence, age, work experience and educational level are correlates of occupational hazards and safety behaviours among graphic designers.

The result of this study revealed that there was a significant relationship ($N = 360$; $r = 0.40$; $p<0.05$). Thus, the null hypothesis which stated that there was no significant relationship between safety behaviours and occupational hazards among graphic designers in Rivers State was rejected. This implies that high exposure to occupational hazards were traceable to poor compliance and development of positive safety behaviours such as use of safety devices as a paramount tool to minimize hazards and accidents occurrence in the workplace. The result of this study is in line with findings of Kuffour (2020) which reported that a substantial amount of back discomfort was experienced by 96.4% of workers were the upper limbs (46%), followed by the waist and back (57%); 71.4% of workers were not using any work-related PPE. Ojo et al. (2020) affirmed that graphic designers who used PPE adequately are less likely to encounter occupational health problems such skin diseases, dermatoses, excessive tear production, recurrent cough, among and prevalence of dry skin diseases and respiratory symptoms was high among painter without the use of safety protective device. Alao et al. (2020) revealed that fewer number of workers (25.7%) knew what PPE meant while 56% indicated that they understood protective devices. Ogunnowo et al. (2010) supported that strict and

consistent compliance with safety measures or rules reduces the extent of occupational hazards exposure among workers and it was significantly associated with it. It was deduced that from NIOSH (2021) on the hierarchy of hazards control practice or use of personal protective equipment is the highest method of occupational hazards control or prevention. No contrary studies were found against the outcome of this present findings. Therefore, safety practices such as use of PPE determine the extent of exposure to occupational hazards among workers.

Conclusion

In regard to the outcome of this study, it was concluded that safety practice among graphic designers was relatively good and the socio-demographic correlates were: age, work experience and educational level.

Recommendations

In respect to the findings of this study, the following recommendations were made:

1. Government, Stakeholders and Employers should integrate occupational health and safety modules of training, organize mandatory workshops and train instructors.

2. Professionals design association should advocate government policies that protect freelance and informal sector designers, including access to health insurance, launch awareness campaigns and establish cooperatives purchasing systems to help members acquire PPE at reduced cost.

3. Government and stakeholders should organize safety training for graphic designers on the basis of safety devices and utilization in order to improve health and safety well-being.

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