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EFFECTIVENESS OF OCCUPATIONAL HEALTH INTERVENTION PROGRAMME ON WORK PLACE ENVIRONMENTAL RISKS AND STRESS MANAGEMENT AMONG NURSES IN SOUTH-WEST NIGERIA

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ABSTRACT

The nurse's role has long been regarded as stress filled based on the physical labour human suffering, work hours, staffing and interpersonal relationships that are central to the work nurses do. Occupational stress is thus, a recognized problem among health care workers in general. Nursing has therefore been identified as an occupation that has high level of risks and stress in the work place environment. Therefore the study investigated the effects of occupational health intervention programme on environmental risks and stress management of staff nurses in South-west Nigeria. A pretest, posttest, control group, quasi-experimental research design was adopted. Two hundred and twenty five (225) respondents were selected for the study. One hundred and twelve (112) respondents were used as experimental group while one hundred and thirteen (113) respondents were used as control group. Fish bowl method was used for grouping the participants into experimental and control groups respectively. A self-developed questionnaire tagged 'Occupational Health Intervention Programme, Environmental Risks and Stress Management Questionnaire OHIPERSMQ' with a reliability coefficient of 0.88 was used. The experimentation lasted 8 weeks. Analysis was done using ANCOVA and Multiple Classification Analysis. Hypotheses were tested at 0.05 alpha level. Findings revealed that occupational health intervention programme has significant effect on risk management knowledge of staff nurses. The experimental group had mean = 4.44, better than the control group that had mean = 2.92. Also, occupational health intervention programme had significant effect on stress management knowledge of nurses with experimental group mean = 7.78, better than the control group mean = 2.36. Based on these findings, it was recommended that medical social workers should ensure that nurses participate in educational training in skills associated with risk reduction, stress reduction and safety promotion so as to guarantee their wellbeing and good job performance.

Keywords: Occupational health, intervention programme, work place environmental risk, stress management, Nurses.

INTRODUCTION

Occupational health programme is a framework designed to promote and maintain is the highest degree of physical, mental and social well-being of workers in all occupations; by preventing departures from health,

controlling risks and the adaptation of work to people and of people to their jobs. Rantanen and Lehtineh (2007) postulated that occupational health services means services entrusted with essentially preventive functions and advisory for responsible for advis-

ing the employers, the workers and their representatives in their undertaking of; first, requirements for establishing and maintaining a safe and healthy working environment which could facilitate optimal physical and mental health in relation to work. Secondly, adaptation of work to capabilities of workers to their state of physical and mental health. Shobba (2003) reiterated that increasing evidences suggests physical and mental health problems relates to "built environment", which include human-modified places such as homes, schools, workplaces, parks and industrial areas among others.

LITERATURE REVIEW

There are myriads of occupational hazards in the nursing profession. They cover a wide range of concerns. Nancy (2016) documented that, there are endless occupational hazards for nurses in the workplace, regardless of their place of employment. These include: infectious diseases, needle stick injury, back injuries, latex allergy, radiation exposure, toxic chemical exposure, emotional and physical stress, emotional overload and violence in the workplace. Ojedokun (2011) summarised into four categories of risks in the nursing job environment namely: Cross infection: such as infective hepatitis, HIV/AIDs, tetanus, typhoid fever, cholera and tuberculosis among others; Traumas: such as needle prick, hot metal injuries, falls and other forms of accidents among others; Violence at work: with patients, especially the psychiatric patients, relatives and among other professional colleagues and lastly, Toxicity: Drug intoxication and inhalation of toxic substances such as anesthetic gases resulting into serious disease conditions such as inhalation pneumonia and so on. Clancy and McVicar (2002) posited that there are guidelines that offer department-specific health and safety

practices for medical workplace. It is imperative that nurses be aware of the potential problems and institute ways to reduce the occupational hazards that they and their colleagues face when they enter their place of employment. Being aware of the potential problems and seeking a reasonable and attainable solution is the key to creating a safer work environment.

The magnitude and diversity of these hazards are not fully appreciated. The acquired immunodeficiency syndrome epidemic has created additional occupational hazards and has focused attention on the problem of occupational hazards to health care workers. This viral infection has contributed to efforts to implement universal infection control precautions and to decrease needle stick injuries (Nancy, 2016). Therefore, health care organizations and providers, who have prompted health and safety campaigns for the general public should not overlook the dangers associated with the health care setting. Rahmany, Behsid, Zamanzadeh and Rahamani (2010) found that the physical environmental hazards commonly found in hospitals include slippery floors, electrical hazards, noise, poor lighting and inadequate ventilation. It was documented in literature that most workplace exposures do not result in disease, because either the biohazard is not transmitted by the air born route or because the agent is present in too low of a dose. The more the nurses know about potential occupational health and safety precautions, the more successful they will be in reducing risks, avoiding accidents and minimizing occupational stressor outcomes.

The aforesaid is germane to the major objective of this study. Arasi, Balasubramanian, Palsamy, Gurusamy, Diana, Ravindran and Balakrishnan (2015) document that Health

Care Workers (HCWs) are exposed to occupational related health hazards. They went further to say that measuring workers perception and the prevalence of these hazards can help facilitate better risk management for HCWs as these workers are envisaged to be the first point of contact, especially in resource poor setting. It was also documented that 8.5% of the research population reported exposure to biological hazard while 93.9% had direct skin contact with infectious materials. 70.5% had at least one needle stick injury in the previous three months. Ergonomic hazards was said to include lifting heavy objects (42%); and standing for long hours (37%) while psychological hazards included negative feelings (20.3%) and verbal or physical abuse during work (20.5%). These results points to the fact that there is the need for training and retraining oriented toward behavioral change and provision of occupational health services. It is further noticed that stress constitutes a major problem in the nursing profession. Adrew (2003) also posits that stress perception is highly subjective and the complexity of nursing practice may result in variation between nurses in their identification of sources of stress especially when the workplace roles of nurses are changing. Nigerian nurses are said to have experienced emotional stress because of the work load and the instance of uncomfortable service environment coupled with non-payment of salaries as a result of economic recession in Nigeria.

Generally, nursing has been identified as an occupation that has high levels of stress. Job stress brings about hazardous impacts not only on nurses' health but also on their abilities to cope with job demands. Parul, Anuraddha, Sanjef, Arvind, Kajal and Rahul (2014) found that risk for professional

nurses are due to poor and unsatisfactory doctor's attitude which was about 3 to 4 times more than excellent attitude of doctors toward staff nurses. In the same report, a significant association was found between departmental posting and level of stress. Meaning that indiscriminate posting from one department to the other and from one hospital setting to the other has been absolutely stressful to nurses. Nurses also reported that they had no time to rest hence they suffer from moderate-to-severe stress. However, it was reported that nurses who felt that the job was not stressful were found to be less stressed compared to those who perceived job as tiring. Inadequate pay, posting in busy departments such as emergency unit (A & E) and Intensive Care Unit (ICU) and too much work are other identified occupational stress.

It is on this premise that Burberk, Robinson and Todd (2002) asserted that occupational stress is a recognized problem in health care workers generally, but nursing has been identified as an occupation with highest level of stress. Lee (2003) and Xianyu and Lanbert (2006) found that stress seriously imparts the provision of quality care and the efficacy of health care delivery. Therefore, it is important to state that these specialized professionals be trained on how to adequately cope and manage their stress. It is equally imperative to emphasise that stress has a cost implication for individuals in terms of health, wellbeing and job satisfaction as well as for the organization in terms of absenteeism and turnover which in turn may impact the quality of patient care. Tehrani and Ayling (2009) found that occupational stress has been cited as a significant health problem. Ajala (2016); Ajala and Osunrinde (2016) stated that excessive burden of mental system caused by stress affect quality of work done, number of

mistakes made, the number of injuries at work, mental illness and physical illness. It is of note that nurses role has long been regarded as stress-filled, based on the physical labour human suffering, work hours, staffing and interpersonal relationships that are central to the work nurses do. Jennings (2007) found that, since the mid-1980s, nurses' work stress has been escalating due to the increasing use of technology, continuing rises in health care costs and turbulence within the work environment. Most people can cope with stress periods but chronic stress produces prolonged changes in the physiological state.

Xianyu and Lanbert (2006) concluded that the issue of job stress coping and burn out among nurses are universal to all managers in health care facilities. It is needful to say that all these stress can be modified in a positive way by the use of appropriate stress management skills. Parul et al (2014) concluded that occupational stress is negatively related to quality of care due to loss of compassion for patients and increased incidences of mistakes and practice errors. Hospital managers are advised to initiate strategies to reduce the amount of occupational stress among the nurses. The nurses need support from their employers to deal with the stress they undergo. Factors responsible for stress among nurses as identified by Adib-Haybakery Khomehian and Masbodi (2012) are conflict with physicians, problems with peers and supervisors and discriminations. The best solution to resolve job stress among hospital nurses therefore, is to develop good personal relationship at work place. In the same vein Mosadeghrad (2013) also found that excessive workload and time pressure are other major factors leading to stress among nurses.

Ajala and Ojo (2014) stated that relevant training (safety and health training) develops employees' skills and abilities to ensure good job performance and healthy workplace attitudes. Therefore, Deborah and Graig (2012) posit that workers' health and safety training is an important part of occupational health and safety programmes. They further asserted that a focus on changing the working behavior of workers exposed to hazardous conditions is less and scientifically rigorous than a focus on helping workers to establish the power to reduce and eliminate work hazards. It should be emphasized that for training to lead to a decreased morbidity and fatality related to hazardous exposures, there is the need to integrate workers training so as to attain such skills. In the same vein, Tom, Michael, Deborah and Joseph (2014) found that health and safety training programmes need to adapt to the very different work contexts of these groups of workers. To design a programme in occupational health and safety, practitioners can choose from a variety of approaches that include the primary purpose, the context for the training and the best approach for the programme. It is imperative that such a programme need be evaluated. Evaluation therefore involves an attempt to document conditions (knowledge, attitudes, beliefs, working conditions and behaviours) before the training is implemented and any changes that occurred as a result of the training. To buttress this, Simon, Ellen and Casten (2013) earlier found that education has an essential role to play in enabling the great majority of people to tend towards that state by preparing them for eventualities at work places. It was recommended that focus should be a gradual acquisition of social and professional skills to promote the concept of health, safety and well-being at work and in life generally. It should be noted that workers are often in-

jured at work. To confirm this, Marie, Ellen and Benedicte (2014) found that workers are frequently injured at work because most workers are vulnerable as a result of their age and certain illnesses. It was also observed that young adults are especially the most vulnerable population for work place accidents; hence they must be trained on work place safety which must also explain how work determines and shapes health. Learning rather than teaching is regarded as a better paradigm to assist occupational health safety skills development. The present study is therefore based on the premise of how occupational health intervention programme could be effectively used to improve occupational health and ensuring safety of health workers including nurses in their work environment.

Statement of the problem

Nurses are integral component of the health care delivery system. In discharging their duties, nurses encounter a variety of occupational health problems which may be categorized into biological, chemical, physical and psychological hazards. Occupational health in terms of environmental risks and stress control have not been given much attention in the field of research despite the fact that nurses were reported to have been involved in occupational risks, hazards and accident. Some of these professionals pass through serious environmental and psychosocial stress that set them off balance most times. It is important to emphasize that stress and exposure to risks negatively affect the proficiency at work and of course, job satisfaction. The problem of this study is to address the issue of how occupational health programme affects work place environmental risk and stress management knowledge among nurses in south-west Nigeria. Based on these problems, the follow-

ing hypotheses were formulated:

1. What is the effect of occupational health intervention program on risk management knowledge among Nigerian nurses?
2. What is the effect of occupational health intervention program on stress management knowledge among Nigerian nurses?

Therefore, the following hypotheses are raised for the research.

Research Hypotheses

1. There is no significant effect of occupational health programme on environmental risks management knowledge among nurses in south-west Nigeria.
2. There is no significant effect of occupational health programme on environmental stress management knowledge among nurses in south-west Nigeria.

Research Methodology

Research Design: The study adopts a pretest, posttest control group quasi-experimental design with a 2 x 1 x 2 factorial matrix.

Population: The population consists of all nurses (4,234) working in the state owned hospitals in south-west Nigeria.

Sampling and Sampling technique: State Government Hospitals in South-West Nigeria were purposively selected. This was done based on the rate of patients' attendance with the resultant workload of nurses. From each state in the South-West, a random sampling was done to select six states hospitals based in the following towns: Oyo, Akure, Ado-Ekiti, Ikeja, Abeokuta and Osogbo. From each selected hospital, fifty nurses were randomly selected to make a total of three hundred respondents. The selected respondents were randomly divided into two, using fish bowl technique to fall into experimental and control groups. After classification into groups, there was free withdrawal by the participants thereby giving 112 for

experimental group and 113 for control group.

Instrumentation: The main instrument was a questionnaire tagged 'Occupational Health Intervention Programme, Environmental Risks and Stress Management Questionnaire OHIPERSMQ' with six self-developed sections. The subsets of the questionnaire consist of the topics on risks and stress management, cross infections and preventive modalities; trauma control modalities; value control, toxicity, toxic substance control and environmental hazard control in the hospital. The questionnaire was designed on four rating scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). Corresponding value of: 4, 3, 2 and 1 respectively. The reliability of the questionnaire was done by administering twenty (20) questionnaires on nurses in one of the state government owned hospitals in Ibadan, Oyo State Nigeria that was not part of the study. The completed questionnaire was subjected to cronbach's alpha test and a reliability coefficient of 0.88 was obtained.

Research procedure: The research was conducted within a time lag of 8 weeks. The first week was used to administer the pretest in the six (6) state government hospitals in south west Nigeria namely: Oyo, Ogun, Osun, Ondo, Ekiti and Lagos States. Six trained research assistants participated in the study. They were senior matrons in each of the health facilities used for the study. The experimental group were treated with the under listed topics during the 2nd – 7th week totaling 6 weeks of intensive occupational health programme held once in a week:

2nd week: Occupational health in the hospi-

tal environment: Risks and stress management; 3rd week: Cross infections and preventive modalities; 4th week: Traumas in the hospital setting control modalities; 5th week: Violence in the hospital environment and control; 6th week: Toxicity and toxic substances in the hospital environment; 7th week: Environmental hazards in the hospital: Biological, physical and Chemical stressors and 8th week: Posttest – involving both the experimental and control groups in the selected states.

The control group participated in pretest, and placebo treatment was given on weekly basis. The same questionnaire used for pretest was re-administered as post-test simultaneously on both the experimental and control group. The posttest lasted one week (8th week).

Data analysis: The data collected were analysed using frequency count and percentages for the demographic characteristics while Analysis of Co-variance (ANCOVA) and Multiple Classifications Analysis (MCA) were used for the analysis of hypotheses at 0.05 level of significance.

RESULT OF FINDING

Demographic characteristics: The result shows that 55 (24.4%) of the respondents were between ages 22 – 29; 93 (41.3) were between ages 30 – 39 while 77 (34.4%) were forty years and above. Majority of the participants, 175 (77.8%) were females and only 50 (22.3%) were male nurses meaning that nursing profession is predominated by females in Nigeria. A larger percentage of the participants, 105 (46.67%) had RN certificate; 93 (41.33%) had dual qualification RNM while only 27 (12.0%) had B.Sc. degree in nursing.

Hypotheses Testing

Ho 1: There is no significant effect of occupational health programme on the risks management knowledge among nurses in south-west Nigeria. This hypothesis was tested using ANCOVA at $\alpha = 0.05$. The result is as shown below in table 1.

Table 1: ANCOVA showing effect of occupational health programme on the risks management knowledge of experimental and Control Groups after occupational health programme

Sourced of variation	Sum of squares	Df	Mean square	F-ratio	Sig. F
Corrected model (Explained)	939.217	2	1905.712	3.657	.027
Covariates	2.147E-03	1	469.609	.001	.997
Treatment	909.612	1	2.147E-03	7.084	.008
Residual	28376.171	221	909.612		
Total	29315.388	223	128.399		

Table 1 shows that there was a significant effect of occupational health programme on the risks management knowledge of experimental and control groups after eight-weeks of occupational health programme ($F_{(2,221)} = 7.084$, $P < 0.05$). Multiple Classification Analysis was also carried out to see if there was going to be difference in the risk management knowledge of the Experimental and Control Groups. The result is shown in table 2 below.

Table 1 shows that there was a significant effect of occupational health programme on the risks management knowledge of experimental and control groups after eight-weeks of occupational health programme ($F_{(2,221)} = 7.084$, $P < 0.05$). Multiple Classification Analysis was also carried out to see if there was going to be difference in the risk management knowledge of the Experimental and Control Groups. The result is shown in table 2 below.

Table 2: Multiple Classification Analysis of the Experimental and Control Groups

Variable Category	N	Unadjusted deviation	Eta	Adjusted for independent variable	Mean	Beta
Experimental	118	1.94		1.94	66.86	
Control	106	-2.16		-2.16	62.76	
			.18			.18
Multiple R2						.032
Multiple R						.179

Grand Mean = 48.47.

The mean score for the Experimental group is 66.86 while that of the Control group is 62.76. The results show that there was a significant difference between the Experi-

mental and the Control groups; hence, the null hypothesis was rejected. Descriptive analysis is as shown in table 3.

Table 3: showing the descriptive analysis of the Pre-Post risk management

Groups		Pre-test score	Post-test score	Gain score (differences between pre-post score)
Experimental	Mean	62.4176	66.8559	4.4383
	Frequency	118	118	118
	Percentage	52.7	52.7	52.7
Control	Mean	59.8363	62.7547	2.9184
	Frequency	106	106	106

Table 3 shows that in the experimental group, the gain score between the pre and post test scores was 4.4383 while that in the pre and posttest in the control group was 2.9184. This means that the experimental group had a higher gain score than the control group.

Ho 2: There is no significant effect of occupational health programme on the stress management knowledge among nurses in south-west Nigeria. This hypothesis was tested using ANCOVA at $\alpha = 0.05$ the result is as shown below in table 4.

Table 4: ANCOVA showing effect of occupational health programme on the stress management knowledge of experimental and control groups after occupational health programme.

Sourced of variation	Sum of squares	Df	Mean square	F-ratio	Sig. F
Corrected model (Explained)	14045.680	2	7022.840	68.558	.000
Covariates	11747.931	1	11747.931	114.686	.000
Treatment	1701.730	1	1701.730	16.613	.000
Residual	22638.302	221	102.436		
Total	36683.982	223	128.399		

*Sig. at $P < 0.05$.

Table 4 shows that there was a significant difference in the stress management knowledge of experimental and control groups after eight-weeks of occupational health programme ($F_{(2,221)} = 16.613, P < 0.05$). Multiple Classification Analysis was also carried out to see if there was going to

be difference in the stress management knowledge of the Experimental and Control Groups. The result was as shown in table 5 below.

Table 5: Multiple Classification Analysis of the Experimental and Control Groups

Variable	Category	N	Unadjusted deviation	Eta	Adjusted for independent variable	Mean	Beta
Experimental		118	3.04		2.62	57.17	
Control		106	-3.38		-2.91	50.75	
				.25			.22
							.383
							.619

Grand Mean = 54.13.

The mean score for the experimental group is 57.17 while that of the control group is 50.75. The results show that there was a significant difference between the experi-

mental and the control groups; hence, the null hypothesis was rejected. The descriptive analysis is as shown in table 6.

Table 6: The descriptive analysis of the Pre-Post stress

Groups		Pre-test score	Post-test score	Gain score (differences between pre-post score)
Experimental	Mean	49.3698	57.1695	7.7797
	Frequency	118	118	118
	Percentage	52.7	52.7	52.7
Control	Mean	48.3962	50.7547	2.3585
	Frequency	106	106	106
	Percentage	47.3	47.3	47.3

Table 6 shows that in the experimental group, the gain score between the pre and posttest scores was 7.7797 while that in the pre and posttest in the control group was 2.3585. This means that the experimental group had a higher gain score than the control group.

DISCUSSION OF FINDING

The study revealed there was a significant difference between risk management knowledge of the experimental group than the control group after an eight week occupational health intervention programme. This is in line with the finding of Deborah and Graig (2012) that workers' health and

safety training is an important part of occupational and safety programmes. Health care workers are meant to observe precautionary measures in the care of all patients and ensure public safety. In this trend, and because nursing profession has been identified as an occupation with high risk in the work place environment, they, the nurses needed additional safety expertise to safeguard themselves and the patients in their care. This agrees with Nancy (2016) who found that nursing have high level of occupational risks. The Canadian Social Work Educators (2010) also document that there are endless risks at work place regardless of the actual location. It is important for nurses to acquire knowl-

edge of potential problems, risks, hazards or dangers at work place in order for them to sustain safe work place. Nurses are therefore advised to institute ways to reduce occupational risks in and around their workplaces. It is imperative that nurses acquaint themselves with guidelines that offer department-specific health and safety practices for medical work place. It is on this note that World Health Assembly (2007) recommends that campaign against risks associated with health care settings would ensure adequate health and safety of nurses and the general hospital population.

The study further revealed that there is significant difference between stress management knowledge of the experimental group and control group after an 8 weeks intervention. This result is in line with Parul et al (2014) who found that risks leads to stress and that there was a significant association between departmental posting and level of stress among nurses. By implication, occupational health programme is germane to increased stress management among nurses. Therefore, these levels of stress could be reduced provided the nurses involved are well knowledgeable about stress management skills. Although, indiscriminate posting could be stressful, nurses have been advised to learn to cope with stress irrespective of the causes. The result is also in line with Burkerk, Coomber, Robinson and Todd (2002) who found that occupational stress is a recognised problem in health care environment. Nurses therefore need information on the management of stress. Jennings (2007) found that continuing education increased stress management knowledge and therefore reduced stress encountered by nurses since the profession has been identified as an occupation with the highest level of stress. Stress was said to have

brought about hazardous impact on nurses health and their ability to cope with job demands. Also, Lee (2003) found that stress seriously impacts the provision of quality of care and the efficiency of health care delivery, hence the need for the enhancement of stress coping mechanism among nurses across the globe. Finally, Mosadeghrad (2013) found that there is significant relationship between excessive workload, time pressure and stress among nurses hence the need for consistent knowledge update on stress management skills among nurses.

Implication for social work practice

1. Since social workers in the health care setting are to see to the wellbeing of employees at work place, it is essential that they should ensure that nurses participate in education and training in skills associated with risks reduction and safety promotion so as to guarantee their wellbeing and good job performance. The skills advocated for nurses include risk assessment, safety planning, de-escalation techniques and non-violent defense.
2. Social workers in the health care setting should ensure that management allow nurses to participate in education and training in cultural competence that emphasizes awareness of the roles of bias stereotyping and racism, as well as the historical, political and economic contexts that may impact safety considerations on individual and agency actions and procedure.
3. Social Workers in the health care setting should advocate with nurses to support the use of ecological and systems approach to help people with their problems because ecology rarely takes into account the implications of unhealthy and depleted ecology.

4. Social workers in the health care setting should educate nurses to explore environmental issues as part of the professional mandate to ensure relieve from occupational stress at work and reduction of risks while on duty. This will reduce the herculean task of interpersonal relationship between nurses, health social workers and the medical team.

CONCLUSION

The result of this finding shows that nurses are essential professionals in health care industry. They pass through stress during the course of discharging their daily duties. In the same vein, the profession is faced with many risks including physical, biological, chemical, and psychological hazards. It is important to conclusively say here that the nurses need consistent "updating" of knowledge about stress and risk management skills for them to be able to perform at work and to have job satisfaction. There is need for other health care providers to also update their knowledge on environmental stress and risks management skills. Efforts of the employers to ensure adequate health of these health care providers should not be under estimated. Therefore, equipping the nurses at regular basis or intervals on knowledge about stress and risks management skills would not be regarded as waste of resource after all.

RECOMMENDATION

1. Hospital managers should initiate strategies to reduce the amount of occupational risks and stress and should provide support to the nurses to deal with these work place problems.
2. Hospital management authority should provide precautions and barrier methods for all health care workers who perform

specialized at-risk procedures in order to reduce work place environmental risks.

3. Efforts by medical laboratory and environmental experts in each hospital should be directed to killing or in-activating infective micro-organism on environmental surfaces of the hospital environment.

4. Health Social Workers and non-governmental organisations should be involved in educating hospital workers on risks and stress management skills.

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