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# Assessment Of The Effects Of Educational Intervention On The Knowledge Of Occupational Hazards By Primary Health Care Workers In Rivers State, Nigeria

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## ABSTRACT

Exposure of primary healthcare workers (PHCW) to occupational hazards has remained a public health concern worldwide. Lack of proper knowledge of the occupational hazards encountered by the PHCWs has been partly responsible for occurrence of these exposure and the consequential risk that follows the exposures that includes injuries, illness, disabilities and at times death. Among the several strategies to prevent and minimize exposure to occupational hazards is educational intervention. The aim of this research is to assess the effects on educational intervention on the knowledge occupational hazards by PHC workers in Rivers state Nigeria. A quasi-experimental design with 54 PHC workers selected from 4 Model Primary Healthcare facilities (MPHC) by purposive sampling. The participants were divided into a control and a study group of 54 in each respectively. Self administered online questionnaire was used to assess baseline and post intervention data. The study group was given a training by lectures, modules, demonstrations and role playing. The group was reassessed (post-test) after 12 weeks interval to compare the baseline results of both groups; the pretest and post test results of the control and the effects on the study group. Data collected were analyzed using descriptive and inferential statistics. Analysis was carried out with SPSS version 26. p value < 0.05 was considered to be statistically significant at 95% CI. The findings showed that response rate (RR) was 100%. Cronbach's Alpha co-efficient of 0.83 (good internal consistency). Respondents were aged of 19 - 60 years old. Most (68.5%) of them were aged 29 - 49 years. Majority of the respondents (81,5%) were females. Most (66.7%) of them were married and half of them had > 10 years of working experience majority had tertiary education. There was no statistical significance in both groups at baseline and between the pretest and post test results in the control group. There was statistical significance (p < 0.038) in knowledge of occupational hazards in the intervention (study) group. There was no statistical significance in the knowledge of the control group (0.316). The educational intervention increased the knowledge of occupational health by the PHC workers.

**Keywords:** Effects, Educational Intervention, Knowledge, Occupational Hazards

## INTRODUCTION

Regardless of several efforts by governments and organizations to ensure that PHCWs are protected from occupational hazards exposure, many PHCWs still remain exposed to this hazards (Auta et al., 2018). This situation has often be attributed to poor practice of occupational health manifested as non adherence to preventive measures for mitigation of occupational hazards by the PHCW especially in developing counties like Nigeria (Ndejjo et al 2015; Aluko et al 2016). PHCWs' exposure to occupational hazards range from exposure to biological, chemical and physical agents through direct contact with patients and specimens/surface. Studies have shown that many PHCWs have not been fully immunized against hepatitis infection a result of lack of training and understanding of the consequences of exposure. Other commonly observed exposures arise from psychological hazards that include stress, anxiety/fear and burnouts due to work overload and ergonomic hazards like low back pain due to low hours of sitting and other postural conditions related to twisting/stretching in inappropriate positions (Ganiyu et al., 2015). Also, it has been reported that low back pain is the commonest ergonomic hazard among PHCWs (Abolfotouh et al., 2015). A common occupational hazards that PHCWs may be exposed to include workplace violence (Abbey et al.,2022), and Abaate (2022).observed that more than a quarter of PHCWs experienced occupational violence although the national prevalence was 29%. In the north of Nigeria biomedical waste exposure due to improper waste handling is a major challenge (Thomas et al., 2022). These exposures frequently result to risks that include infection with pathogen like hepatitis and HIV virus (Nour-Eldein and Mohamed; Akpuh et al., 2020), health hazards from exposure to radiation/radioactive waste (Yusuf et al., 2022), needle stick injuries, falls from wet floors. Research has showed that occupational infection among healthcare workers accounts for 37% of all hepatitis B infections worldwide (Ghost., 2013). In Port Harcourt Nigeria, it was reported that the prevalence of exposure to infection was 45% among healthcare workers (Akpuh et al., 2020). Poor practice of occupational health by PHCW has been attributed partly to a lack of understanding of the nature and risks of exposure to these occupational hazards due to poor knowledge (Thomas et al., 2022). This manifests as lack of knowledge, negative attitude toward occupational hazards, consequently resulting to poor practice. These circumstances have led to the adoption of proactive innovations including educational intervention. Several researchers have showed that educational intervention increased the knowledge of occupational hazards by PHCWs (Abdel-Aziz et al., 2016; Leo et al., 2021). However, there is paucity of studies on the effects of educational intervention on knowledge of occupational hazards by PHCWs in the south-south region of Nigeria and in Rivers state in particular although a few studies (Ogbondah ., 2021; Thomas et al 2022) have been carried out on the subject country-wise. The objective of this study is to assess the effect of an educational intervention on the knowledge of common occupational hazards by PHCWs in Rivers State, Nigeria.

## METHOD

A quasi-experimental design was adopted with a sample size of 54 respondents each selected from two model primary health care centres (MPHC) through a purposive technique. They included doctor, nurses and midwives, community health officers, CHOs, CHEWs, laboratory scientists/techs., pharmacy technicians, medical records/clerical officers and others (cleaners). All respondents were self-administered structured online questionnaire at the beginning to obtain baseline data. The questionnaire assessed the knowledge of common occupational hazards on a Likert scale. Thereafter, the participants in the intervention group were divided into 5 groups of eleven who received a physical training through lectures on power point, modules for 3 hours by the researcher and research assistants nominated by the Rivers state primary health care management board (RSPHCMB). Role plays and discussions were carried out after each module. Each group trained for 4 hours during work hours. The participants were re-assessed 12 weeks after the intervention. The period was between April to July, 2024.

**Data Analysis**

Data analysis was carried out using SPSS version 26 and results were presented in tables, frequencies, percentages, chi square test and students t-test were conducted to compare pretest and post test results. P values < 0.05 were considered to be statistically significant at 95% CI.

**RESULTS**

**Table 1: Social Demographic Characteristics**

Variable	Frequency n=54	Percent
<b>Age</b>		
<20	1	1.9
20-29	8	14.8
30-39	15	27.8
40-49	22	40.7
50-59	7	13.0
≥60	1	1.9
<b>Sex</b>		
Male	10	18.5
Female	44	81.5
<b>Marital Status</b>		
Married	36	66.7
Single	14	25.9
Living with partner	2	3.7
Separated/Divorced	1	1.9
Widow/widower	1	1.9
<b>Religion</b>		
Christian	54	100.0
<b>Education</b>		
Secondary	7	13.0
Tertiary	47	87.0
<b>Occupation</b>		
Doctor	7	13.0
Nurse/Midwife	10	18.5
Pharmacy	4	7.4
Laboratory scientist	9	16.7
CHO	9	16.7
CHEW	4	7.4
Medical records officer	7	13.0
Others	4	7.4
<b>Years of experience</b>		
More than 12 months	4	7.4
2-5 years	8	14.8
5-10 years	15	27.8
> 10 years	27	50.0

A total of 54 questionnaires were administered study groups and all were considered valid for inclusion after filling. This showed a response rate of 100%.

The result shows that 1 (1.9%) respondent was less than 20 years, 8 (14.8%) were aged 20-29 years, 15 (27.8%) were 30-39 years, 22 (40.7%) were aged 40-49, 7 (13%) were aged 50-59 and 1 was aged more than 60 years while 44 (81.5%) were females and 10 (18.5%) were males. For marital status 36 (66.7%) were married, 14 (25.9%) were singles, 2 (3.7%) lived together, 1 (1.9%) was separated and 1 (1.9%) was widowed. 54 (100.0%) were Christians. Also, 47 (87.0%) attained tertiary level of education and 7 (13%) attained secondary education. For professional class 10 (18.5%) were nurses/mid-wife, 7 (13%) were doctors, 7 (13%) were medical record officers. CHO (9) and Laboratory scientists (9) were 16.7% respectively while 4 (7%) were CHEWs and 4 (7) were other like cleaners. Also, for years of working experience, 27 (50.0%) had over 10 years of experience, 15 (27.8%) had 5-10 years, 8 (14.8%) had 2-5 years and 4 (7.4) had had more than 12 months.

**Table 2: Knowledge of Occupational Hazards**

Variable	Pre- Intervention	Post- Intervention	X <sup>2</sup> (P-value)
<b>Hand washing with soap a under water before and after a procedure is a necessary universal precaution</b>			
Strongly Agree	40(74.1)	48(88.9)	3.927(0.048)
Agee	14(25.9)	6(11.1)	
<b>Needle stick Injury can result in exposure to hepatitis B and HIV infection</b>			
Strongly Agree	38(70.4)	44(81.5)	2.439(0.295)
Agree	15(27.8)	10(18.5)	
Disagree	1(1.9)	0(0.0)	
<b>All categories of PHC worker collaboration are needed for a health work environment</b>			
Strongly Agree	31 (57.4)	37(68.5)	1.974(0.373)
Agree	20 (37.0)	16(29.6)	
Disagree	3 (5.6)	1(1.9)	
<b>Use of PPE is mandatory when carrying out a procedure</b>			
Strongly Agree	32(59.3)	34(63.0)	1.085(0.581)
Agree	21(38.9)	20(37.0)	
Disagree	1(1.9)	0(0.0)	
<b>Biomedical waste is not more harmful than general waste</b>			
Strongly Agree	6(11.1)	5(9.3)	9.848(0.020)
Agree	11(20.4)	1(1.9)	
Disagree	20(37.0)	26(48.1)	
Strongly Disagree	17(31.5)	22(40.7)	
<b>Vaccination of PHC workers against hepatitis B and COVID infection will protect primary health care workers</b>			
Strongly agree	18(51.9)	35(64.8)	4.661(0.198)
Agree	26(48.1)	17(31.5)	
Disagree	0(0.0)	1(1.9)	
Strongly Disagree	0(0.0)	1(1.9)	
<b>Lifting patients or heavy load at work can lead to musculoskeletal pain injuries</b>			
Strongly agree	23(42.6)	18(33.3)	7.310(0.063)

Agree		22(40.7)	33(61.1)	
Disagree		2(3.7)	2(3.7)	
Strongly Disagree		7(13.0)	1(1.9)	
<b>PHC workers on annual or maternity leave should take a vacation and not work elsewhere during the period of leave</b>				
Strongly agree		22(40.7)	25(46.3)	2.972(0.396)
Agree		20(37.0)	23(42.6)	
Disagree		10(18.5)	4(7.4)	
Strongly Disagree		2(3.7)	2(3.7)	
<b>Burn outs can result from work experiences</b>				
Strongly agree		24(44.4)	15(27.8)	4.563(0.207)
Agree		27(50.0)	36(66.7)	
Disagree		3(5.6)	2(3.7)	
Strongly Disagree		0(0.0)	1(1.9)	
<hr/>				
<b>Cleaning agents do not constitute occupational hazards</b>				
Strongly Agree	8 (14.8)		7 (13.0)	2.946(0.400)
Agree	19 (35.2)		24 (44.4)	
Disagree	19 (35.2)		20 (37.0)	
Strongly Disagree	8 (14.8)		3 (5.6)	
<b>Verbal abuse is not an occupational hazard</b>				
Strongly agree	3 (5.6)		14 (25.9)	9.969(0.019)
Agree	10 (18.5)		12 (22.2)	
Disagree	30 (55.6)		19 (35.2)	
Strongly Disagree	11 (20.4)		9 (16.7)	

Table 2 shows a significant difference in the knowledge of the importance of hand washing ( $p = 0.048$ ) with 74.1% of the respondents in the pre-intervention stage and 88.9% at the post intervention stage respectively. A significant difference was observed on the knowledge of biomedical waste ( $p = 0.020$ ) between the pretest and the post test results while there was no significant difference on the information that needle stick injury can result to exposure to hepatitis B virus ( $p = 0.295$ ). Also there was no significant statistical significance in the knowledge of good collaboration for a healthy work environment ( $p = 0.373$ ); the importance of PPE use when carrying out a procedure ( $p = 0.581$ ) after the intervention. There was no significant difference in the information about vaccination of PHC care workers ( $p = 0.198$ ), the lifting patients or heavy load ( $p = 0.063$ ); the importance of resting during annual leave ( $p = 0.396$ ) cause of burn out ( $p = 0.207$ ) the knowledge of the effects of cleaning agents ( $p = 0.400$ ). The was a significant difference on the knowledge of verbal abuse as an occupational hazard ( $p = 0.019$ ), 11 (20.4%) of the respondents at the pre-intervention stage strongly disagreed compared to 9 (16.7%) of the respondents at the post-intervention stage. The study showed no significant difference on

**Table 3: Overall Level of knowledge of occupational hazards**

Variable	Pre-Intervention	Post-Intervention	X <sup>2</sup> (P-value)
Poor	0 (0.0)	0 (0.0)	13.300 (<0.001)
Fair	18 (33.3)	3 (5.6)	
Good	36 (66.7)	51 (94.4)	

The result in table 4.3d showed a significant difference in the pretest and post intervention knowledge, 36 (66.7%) had good knowledge at the pre-intervention stage compared to 51 (94.4%) at the post intervention stage

**Table 4: Factors Associated with Knowledge of Occupational Health**

Variable	Knowledge		X <sup>2</sup> (P-value)
	Fair n(%)	Good (%)	
<b>Age group</b>			
<30	3 (33.3)	6 (66.7)	0.00 (1.000)
≥30	15 (33.3)	30 (66.7)	
<b>Sex</b>			
Male	3 (30.0)	7 (70.0)	0.061 (0.804)
Female	15 (34.1)	29 (65.9)	
<b>Relationship Status</b>			
Have partner	11 (28.9)	27 (71.1)	1.110 (0.292)
No partner	7 (43.8)	9 (56.3)	
<b>Education</b>			
Secondary	4 (57.1)	3 (42.9)	2.052 (0.152)
Tertiary	14 (29.8)	33 (70.2)	
<b>Occupation</b>			
Doctor	1 (14.3)	6 (85.7)	5.324 (0.378)
Nurse/Midwife	2 (20.0)	8 (80.0)	
Pharmacy	2 (50.0)	2 (50.0)	
Laboratory scientist	5 (38.5)	7 (77.8)	
CHO/CHEW	5 (38.5)	8 (61.5)	
Others	6 (54.1)	5 (45.5)	
<b>Years of experience</b>			
≤5 years	2 (16.7)	10 (83.3)	1.929 (0.165)
>5 years	16 (38.1)	26 (61.9)	
<b>Trained on job safety and occupational hazards</b>			
Yes	8 (28.6)	20 (71.4)	0.593 (0.441)
No	10 (38.5)	16 (61.5)	
<b>Trained on job safety and occupational hazards in past 12 months</b>			
Yes	6 (27.3)	16 (72.7)	0.085 (0.771)
No	2 (33.3)	4 (66.7)	
<b>Fully vaccinated for HNV</b>			
Yes	11 (26.8)	30 (73.2)	3.242 (0.072)
No	7 (53.8)	6 (46.2)	

There was no significant association between demographic characteristics and knowledge of occupational by PHCWs.

**Table 5: Level of Knowledge of Occupational Hazards: Control group**

Variable	Pre- Intervention	Post-Intervention	X <sup>2</sup> (P-value)
Poor	1 (1.9)	0 (0.0)	4.236 (0.316)
Fair	18 (33.3)	17 (31.5)	
Good	35 (68.4)	37 (68.5)	

Table 5 showed that there is no significant statistical difference in the level of knowledge between the pretest and post test (  $p = 0.316$  )

## DISCUSSION

The findings in this study reveal that there was a high level of knowledge about occupational hazards by the PHCWs. This finding is in line with findings from similar studies by other researchers (Nour-Eldein et al., 2016; Arcanjo et al., 2018) that worked in similar occupational settings although there were variations in the level of knowledge between the studies when compared with this present study. An example is the study by Ogbonndah that reported a lower (50%) level compared to other studies had very high levels (Thomas et al., 2022). This findings of high knowledge score in this study is in contrast with some as shown in the findings from studies conducted by in Enugu Nigeria where the level of good knowledge was less than 25% (Ochie et al., 2022). The results showed that the intervention improved the knowledge of the respondents on the importance of hand washing under running water before and after a procedure from 74.1% to 88.9% resonates with findings in similar workplace setting that were conducted by other researchers (Abdel-Aziz et al., 2016), where the knowledge of proper hand washing improved from 39.4% to 85.6%. The variations in the level of improvement in knowledge between studies can be explained by the relatively high level of knowledge before the intervention and the effectiveness of the training. Conversely, low level of knowledge before the intervention may lead to a wider range of improvement provided the strategy and the effectiveness of the training were appropriate. All previous studies that were assessed showed that educational intervention improved the knowledge of occupational hazards. Knowledge of biomedical waste as a hazard improved as the findings show that 20.4% of the respondents reported that biomedical waste is not harmful before the intervention only 1.9% so after the intervention. The findings are similar to the findings in other studies conducted in Alexandria Egypt where the knowledge of the respondents that occupational hazards occur due to improper handling increased from 90% to 95.7% (Mostafa et al., 2022; Hosny et al., 2018). Also, in Pakistan it was shown that an educational intervention was effective in improving the knowledge of respondents on waste segregation from 47% to 66% and that of waste collection and waste disposal increased from 55% to 79%. (Kumar et al., 2015). This study also showed that educational intervention increased the knowledge of respondents on the prevention of occupational violence ( $p = 0.019$ ) from 5.6% to 25.9%. This finding resonates with that of Omran et al. (2022), where the knowledge of the prevention of occupational violence increased after an intervention 24.1% to 83.9% .

There were no remarkable increase in the knowledge of respondents after the intervention on information about vaccination, importance of taking a rest from work during annual leave, cause of burnout and effects of cleaning agents on respondents as all measurement outcomes showed  $p > 0.05$ .

## Summary

The study proved that educational intervention benefited the respondents by increasing their overall knowledge of occupational hazards to 94% at the end of the intervention ( $p < 0.001$ ).

### Limitations

The results of this study is only applicable to healthcare workers in the PHC setting and cannot be generalized to healthcare workers in secondary and tertiary institutions.

The outcome of this study cannot be generalized for other regions of Nigeria with different settings Also there was lack of funding for greater coverage hence the choice of a quasi experimental design. Most of the respondents self-reported and there is possibility of bias.

### CONCLUSION

Prevention and control of occupational hazards is critical in the safety and well-being of healthcare workers especially PHC workers. Good knowledge and identification of occupational hazards and the risk of exposure through training interventions will help in the mitigation common occupational hazards. This study has revealed that educational intervention is an effective way of improving the knowledge of PHCWs on occupational hazards thereby improving their practice of occupational health.

### RECOMMENDATIONS

1. Training of prospective workers on occupational health at the time of employment.
2. Education and training and retraining of workers on the importance of occupational health in order to be abreast with new technologies and for best practices.
3. Making vaccination of all PHC workers mandatory.
4. Further studies are recommended to determine the reasons why the intervention was not effective on certain aspects of occupational health.

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