International Journal of Innovative Social Sciences & Humanities Research 12(4):178-188, Oct-Dec., 2024

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doi:10.5281/zenodo.14388639

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

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ABSTRACT
Regardless of the frequent exposure to PHC workers (PHCWs) to different kinds of occupational hazards and the risk that are consequent to these exposures, their attitudes to occupational hazards has remained poor. This situation is often associated with risks of illness, injuries and at times death which has necessitated the undertaking different approaches to cause a positive attitude towards ccupational hazards through educational intervention. The objective of this study is to assess the effects of an educational intervention on the attitude towards occupational hazards by PHCW. A quasi-experimental (pretest/posttest) design was used. 54 participants were selected through purposive sampling technique. Data collection was accomplished using a semi-structured self-administered questionnaire delivered online, before the pretest to obtain baseline data and posttest was done 12 weeks after the intervention.
This was carried out using SPSS version 26 and results were presented in frequencies, tables, chi square value and p values < 0.05 were considered to be significant at 95% CI. Response rate (RR) was 100%. There were more females (81.5%), Most respondents were aged between 29- 49 years old; Majority (66.7%) were married and half (50%) had over 10 years of work experience. There was significant statistical difference in the attitude ($p < 0.001$) towards occupational hazards between pretest and post test. Factors associated with good attitude were: receiving training during employment ($p = 0.005$), education level ($p = 0.015$), being fully vaccinated ($p = 0.007$). Educational intervention produced a positive effect on the attitude of the PHC workers towards occupational hazards.
Keywords: Attitude, Effects, Educational Intervention, Occupational hazards

INTRODUCTION
Globally, more than 35 million healthcare workers (HCW) are exposed to different types of occupational hazards that include infections, illness, injuries with more than 90% occurring in developing countries

like Nigeria (Nmadu et al., 2016). These hazards often impact negatively on health and well-being of the PHC workers disrupting effective service delivery (Browne et al., 2018; Pandey & Singh., 2018).. Several researchers have posited that poor attitude is a key challenge mitigating against the good practice of occupational health (Paul et al., 2020). While lack of good knowledge has been recognized as a key impediment to the practice of occupational health by PHCWs (Burn et al., 2020), attaining good knowledge does not necessarily translate to positive attitude towards occupational health without the proper attitude (Onowhatkpor et al., 2017; Noe et al., 2017).

Attitude refers to the perception, response or reactions to the knowledge of potential exposure to occupational hazards with reference to the idea, circumstance of threat of exposure to hazards (Adisa & Omitogun., 2019) and the responses are components of beliefs/culture, emotional responses and behavioral tendencies (Garino., 2020).

According to Kumar et al. (2022), other factors influence the attitude of the PHC worker including a safe working environment, personal moral priorities, personal experiences and observations and perceived benefits and risks. Poor attitude towards occupational hazards has frequently led to exposure of PHCWs to different types of occupational hazards that result in avoidable risk that include injuries, infections from pathogens, illness, death. Non adherence/non compliance to measures to prevent occupational hazards by PHCWs has been associated with poor attitude towards occupational hazards (Railey., 2023; Pees et al., 2020). It has therefore become imperative that a behavioral change is sacrosanct for positive attitude towards occupational hazards in order to prevent exposure of the PHCWs and to ensure their health and well-being as well as protect their families and public from hazards exposure. Educational intervention has been recognized as a key strategy for achieving a positive attitude of PHCWs towards occupational hazards (Ammendolia et al., 2016). This study is intended to determine to whether educational intervention will produce a positive change in the attitude towards occupational hazards by PHCWs or not. The aim of this study is to assess the effects on educational intervention on the attitude towards common occupational hazards by PHC workers in Rivers state Nigeria.

METHOD

The study adopted a quasi-experimental design with a sample size of 54 participants in the control group and 54 participants in the intervention group. Participants were selected by purposive sampling technique and both groups were treated to a semi-structured self-administered questionnaire on line with inputs from *A* Manual for primary health care workers (WHO, 2022). The questionnaire had sections on socio-demographic characteristics, and 11 questions on 4 point Likert scale. Baseline data were collected for analysis. The intervention group was trained on occupational prevention of occupational hazards and the right attitude using power point presentation, modules, role plays, group discussion. Physical training was carried out for 3 hours a day and over 4 day. The training was conducted by the researcher and research assistants from the Rivers state Primary Health Care Management Board. Post test was carried out on the control and the intervention groups after 12 weeks following the intervention.

Data analysis: Data was analyzed using SPSS version 26 and results were presented in tables of frequencies, percentages, chi-square, and t-test. P value < 0.05 were accepted as statistically significant at CI of 95%.

RESULTS

Socio-demographic characteristics of participants

Variable	Frequency n=54	Percent
Age		
<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
Sex		
Male	10	18.5
Female	44	81.5
Marital Status		
Married	36	66.7
Single	14	25.9
Living with partner	2	3.7
Separated/Divorced	1	1.9
Widow/widower	1	1.9
Religion		
Christian	54	100.0
Education		
Secondary	7	13.0
Tertiary	47	87.0
Occupation		
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
Years of experience		
More than 12 months	4	7.4
2-5 years	8	14.8
5-10 years	15	27.8
> 10 years	27	50.0

Respondents' age (19 - 60 years old), most (68.5%) aged 29 - 49 years. There were more females (81.%). Most married (66.7%) and half (> 10 years) of working experience majority had tertiary education.

Table 2: Attitude Towards Occupational Hazards

Variable	Pre-Intervention	Post-Intervention	X^2(P-value)
Needles can still be recapped with care by experience worker			
Strongly agree	7(13.0)	2(3.7)	14.660(0.002)
Agree	15(27.8)	4(7.4)	
Disagree	13(24.1)	28(51.9)	
Strongly Disagree	19(35.2)	20(37.0)	
collaboration is important between all cadre in my facility			
Strongly agree	3(5.6)	6(11.1)	30.946(<0.001)
Agree	7(13.0)	32(59.3)	
Disagree	38(70.4)	12(22.2)	
Strongly Disagree	6(11.1)	4(7.4)	
Hand washing can be avoided before and after a procedure to save time			
Strongly agree	5(9.3)	3(5.6)	23.087(<0.001)
Agree	12(22.2)	2(3.7)	
Disagree	7(13.0)	29(53.7)	
Strongly Disagree	30(55.6)	20(37.0)	
Lifting patients and heavy object can always be carried out			
Strongly agree	1(1.9)	1(1.9)	4.962(0.175_
Agree	12(22.2)	13(24.1)	
Disagree	21(38.9)	30(55.6)	
Strongly Disagree	20(37.0)	10(18.5)	
Undiluted cleaning agents will be more effective against pathogens			
Strongly agree	17(31.5)	22(40.7)	4.801(0.187)
Agree	29(53.7)	19(35.2)	
Disagree	6(11.1)	7(13.0)	
Strongly Disagree	2(3.7)	6(11.1)	

Table 2 shows a significant difference in the attitude towards recapping needles p = 0.002, 7 (13.0%) of the respondents in the pre-intervention stage strongly agreed that needles can still be recapped with care by experience worker compared to 2 (3.7%) of the respondents in the post-intervention stage. A significant difference was observed about the attitude towards collaboration between all health care workers p < 0.001, 7 (13.0%) of the respondents in the pre-intervention stage agreed compared to 32 (59.3%) of the respondents at the post-intervention stage.

The study showed a significant difference on the attitude towards hand washing p < 0.001, 12 (22.2%) of the respondents at the pre-intervention stage agreed that hand-washing can be avoided before and after a procedure to save time compared to 2 (3.7%) of the respondents at the post intervention stage. The result showed no significant difference in the attitude towards lifting of patients p = 0.175, and undiluted cleaning agents p = 0.187

Table 3: Attitude Towards Occupational Hazards

Variable	Pre-Intervention	Post-Intervention	X^2(P-value)
Verbal or physical abuse is a normal occurrence in the facility			
Strongly agree	10(18.5)	2(3.7)	15.556(0.001)
Agree	13(24.1)	9(16.7)	
Disagree	14(25.9)	33(61.1)	
Strongly Disagree	17(31.5)	10(18.5)	
There is a need to take a paid job during annual leave and make extra money			
Strongly agree	5(9.3)	0(0.0)	20.436(<0.001)
Agree	19(35.2)	4(7.4)	
Disagree	17 (31.5)	33 (61.1)	
Strongly Disagree	13(24.1)	17(31.5)	
Burn outs after work is not an issue because one has to work as hard as possible to make to survive hard times			
Strongly agree	3(5.6)	0(0.0)	11.267(0.010)
Agree	13(24.1)	3(5.6)	
Disagree	23(42.6)	29(53.7)	
Strongly Disagree	15(27.8)	22(40.7)	
Biomedical waste may be collected together with general waste in a waste bag/basket			
Strongly agree	4(7.4)	0(0.0)	10.769(0.013)
Agree	8(14.8)	1(1.9)	
Disagree	22(40.7)	29(53.7)	
Strongly Disagree	20(37.0)	24(44.4)	

This study showed a significant difference in the perception of verbal or physical abuse $p < 0.001$, 14 (25.9%) pf the respondents in the pre-intervention stage disagreed that verbal or physical abuse is a normal occurrence in the facility compared to 33 (61.1%) of the respondents at the post-intervention stage.

A significant difference was observed on the perception of working during annual leave $p < 0.001$, while 19 (35.2%) of the respondents at the pre-intervention stage agreed that there is need to take a paid job during annual leave and make extra money, 33 (61.1%) of the respondents disagreed at the post intervention stage. This study showed a significant difference on the perception towards burn out $p = 0.010$, 13 (24.1%) of the respondents a the pre-intervention stage agreed that burn out after work is not an issue because on has to work as hard as possible compared to 22 (40.7%) who disagreed at the post-intervention stage.

The result showed a significant difference on the attitude towards biomedical waste disposal p = 0.013, 8 (14.8%) of the respondents at the pre-intervention stage agreed that biomedical waste may be collected together with general waste compared to 24 (44.4%) of the respondents at the post intervention stage who strongly disagreed.

Table 4: Attitude Towards Occupational Hazards

Variable	Pre-Intervention	Post-Intervention	X^2(P-value)
During emergencies or lack of PPE procedures can be carried out carefully without use of PPE			
Strongly agree	3(5.6)	2(3.7)	8.333(0.040)
Agree	13(24.1)	4(7.4)	
Disagree	16(29.6)	28(51.9)	
Strongly Disagree	22(40.7)	20(37.0)	
Vaccination of PHC workers against hepatitis B should be optional			
Strongly agree	8(14.8)	2(3.7)	10.718(0.013)
Agree	14(25.9)	5(9.3)	
Disagree	14(25.9)	21(38.9)	
Strongly Disagree	18(33.3)	26(48.1)	

Table 5: Attitude Towards Occupational Hazards

Variable	Pre-Intervention	Post-Intervention	X^2 (P-value)
Negative	17 (31.5)	2 (3.7)	14.370 (<0.001)
Positive	37(68.5)	52(96.3)	

The result showed a significant difference on the use of PPE during emergencies p = 0.040, 13 (24.1%) of the respondents at the pre-intervention stage agreed that during emergencies or lack of PPE procedures can be carried out without use of PPE compared to 28 (51.9%) of the respondents who disagreed at the post-intervention stage. There was a significant difference on the perception towards vaccination of PHC workers against HBV p = 0.013, 8(14.8%) of the respondents strongly agreed that vaccination should be optional at the pre-intervention stage compared to 2 (3.7%) of the respondents at the post-intervention stage.

Table 5: above summarizes the overall level of attitude of the respondents. The result showed a significant difference in the pretest and post intervention attitude p < 0.001, 37 (68.5%) of the respondent had positive attitude at the intervention stage compared to 52 (96.3%) at the post intervention stage

Table 6: Factors Associated with Attitude Towards Occupational hazards

Variable	Attitude		X^2 (P-value)
	Negative n(%)	Positive n(%)	
Age group			
<30	4 (44.4)	5 (55.6)	0.841 (0.359)
≥30	13 (28.9)	32 (71.1)	
Sex			
Male	2 (20.0)	8 (80.0)	0.750 (0.386)
Female	15 (34.1)	29 (65.9)	
Relationship Status			
Have partner	9 (23.7)	29 (76.3)	3.615 (0.057)
No partner	8 (50.0)	8 (50.0)	
Education			
Secondary	5 (71.4)	2 (28.6)	5.950 (0.015)
Tertiary	12 (25.5)	35 (74.5)	
Occupation			
Doctor	0 (0.0)	7 (100.0)	12.361(0.030)
Nurse/Midwife	1 (10.0)	9 (90.0)	
Pharmacy	3 (75.0)	1 (25.0)	
Laboratory scientist	2 (22.2)	7 (77.8)	
CHO/CHEW	7 (53.8)	6 (46.2)	
Others	4 (36.4)	7 (63.5)	
Years of experience			
≤5 years	4 (33.3)	8 (66.7)	0.025(0.876)
>5 years	13 (31.0)	29 (69.0)	
Trained on job safety and occupational hazards			
Yes	4 (14.3)	24 (85.7)	7.972 (0.005)
No	13 (50.0)	13 (50.0)	
Trained on job safety and occupational hazards in past 12 months			
Yes	3 (13.6)	19 (86.4)	0.035(0.851)
No	1 (16.7)	5 (83.3)	
Fully vaccinated for HNV			
Yes	9 (22.0)	32 (78.0)	7.171 (0.007)
No	8 (61.5)	5 (38.5)	
Knowledge			
Fair	9 (50.0)	9 (50.0)	4.293 (0.038)
Good	8 (22.2)	28 (77.8)	

The result in table 4 shows that occupation (p = 0.030), receiving training during employment (p = 0,005), education level p = 0.015, been fully vaccinated (p = 0.007) and knowledge p = 0.038 were significantly associated with attitude towards occupational hazards.

Table 7: Table Attitude Towards Occupational Hazards: Control group

Variable	Pre-Intervention	Post-Intervention	X^2 (P-value)
Negative	17 (31.5)	18 (33.3)	3.431 (0.624)
Positive	37 (68.5)	36 (66.7)	

Table 7 showed that there is no significant statistical difference in the level of attitude towards occupational hazards in the participants between the pretest and post test (p = 0. 624)

DISCUSSION

This study reveals that the educational intervention improved the attitude of the respondents to 96.3% when compared with the level before the intervention (68.5%). This positive attitudinal change resonates finding in other studies (Mostafa et al. 2022; El- Leithy et al., 2013; Xu et al 2016). This study specifically compared the attitude of respondents before and after the intervention for different variable. The study showed that the intervention had positive impact on the attitude of respondents towards recapping of needles (p = 0.002). This finding resonates with findings from similar studies conducted by researchers (Nour-Eldein & Mohamed., 2016; El-Eleithy et al., 2013). According to the findings by Nour-Eldein & Mohamed. (2016), the training was effective in mitigating the attitude recapping needles. Also, the training showed a positive effect on the attitude for collaboration (p < 0.001) which is in agreement with findings from in United Arab Emirate by Guraya et al. (2021) and another in Padova Italy by Zanotti et al. (2015). There was significant improvement (p = 0.001) in perceived cooperation (p < 0.001) and respect for others (p < 0.05). Furthermore, the current study showed that only 2.3% (p = 0.001) of respondents agreed that hand washing can be avoided before and after a procedure at the end of the intervention which concurs with findings in AV et al. (2018) in Mandya India that showed that an intervention had a positive attitude towards hand washing before and after a procedure by the healthcare workers. However, certain study findings did not align with those of this study. Abah. (2022) posited that where lapses exist in the provision of equipment/utilities and misconceptions by healthcare workers a positive attitude towards hand washing may not be achieved effectively.

Although there were no obvious positive effects on the attitude towards lifting heavy patients (p = 0.175) and undiluted cleaning agents (p = 0.187), there was a positive effect on the attitude towards verbal/physical abuse (p < 0.001) by the respondents after the intervention when the findings of this study were compared with findings by Al-Ali et al. (2016) in Jordan that reported a positive effect (p = 0.026) on attitude of the respondents after intervention. Similarly, the results in this study resembles the findings in a study carried out by Zhang et al. (2022) in Suzhou China which showed the incidence of occupational violence decreased (p < 0.05) and the copping attitude towards occupational violence by the respondents improved positively after the intervention.

For extra work during annual leave, the results in this study showed that more than 60% of respondents perceived that there was no need to work during their annual leave (p < 0.001) after the intervention in comparison to 31.5% before the intervention. Although there is paucity of literature on attitude to work during annual leave, Steinmetz et al. (2014) have posited that attitude to work during annual leave is associated with intention to earn extra revenue due to poor wages as a consequence of economic hardship.

Furthermore, the current study evaluated the attitude towards the prevention of psychological hazards like burnout among the PHC workers. The findings suggest that the intervention helped in achieving a positive attitude (p = 0.010) towards the mitigation of burnouts. For perception of burnout as a challenge, there was an positive attitude towards the perception that burn outs is an occupational hazard after the intervention (p = 0.010) in the current study. This observation aligns with those of Asuero et a. (2014) that showed a mean score improved from -10.4 to - 1.5 while the score for emotional exhaustion decreased by 5.5 points from 8.7 to 2.4. In another similar study, El-Amrosy (2019) showed a total mean score reduction from 58.6 to 32.1 and emotional exhaustion was perceive to have reduced from 24.12 to

11.94, while in the study in Mozambique by Mandede et al. (2017) there was positive impact following a training where mean score for burnouts decreased from 30.9 to 23.3. The variance in the reported positive effects on attitude on the towards burnouts among the respondents in the different studies is not clearly understood but it can be reasoned that attitudes are influenced by culture of safety in the workplace, level of education, cultural beliefs and the methods/effectiveness of the training. This showed that the educational intervention caused a positive effect on the attitude towards occupational hazards by the respondents in the study.

The present study showed that the attitude towards biomedical waste management was better after the intervention although less than half (44%) of the respondents had good attitude ($p = 0.013$) towards biomedical waste disposal after the intervention. This finding is in resonance with the findings in contemporary studies under similar occupational settings. Examples include the study by Obadina & Oyerinde. (2023) among healthcare workers in Lagos where the attitude towards the proper handling of biomedical waste among skilled workers increase from a mean score of 27.38 to 34.12 while that of waste handlers also increased after the intervention to 31.84 from 27.80 before the intervention. This shows that the intervention was effective in improving the attitude of the respondents towards proper waste handling. Reasons that have been advanced for the failure of an intervention to result in a positive attitude towards biomedical waste management include poor quality of training (Vasan et al., 2017). This study showed that at the end of the intervention, only 9.3% of the respondents agreed that procedures can be undertaken without putting on PPE in the case of emergency or lack of PPE while before the intervention, 24.1% had agreed that procedures can be carried out without wearing glove in the case pf emergency or lack of PPE.. This showed a significant ($p = 0.04$) improvement in the attitude of the respondents in this study. This finding is similar to that of Mostafa et al. (2022) which showed that the attitude of wearing PPE before a procedure by the respondents improved after an educational intervention.

This study workers' attitude after the intervention only as 3.7% of the respondents agreed that HBV vaccination should be optional in comparison with 14.4% before the intervention. This finding is similar to the findings in other studies in Egypt (Nour-Eldein & Mohamed., 2016) and in (Mostafa et al., 2022). Some interventions may not achieve positive results as posited by Kumar et al. (2015) where the training was not effective among some cadre of of workers due to level of educational and inadequate training. Although the reasons for failed intervention cannot be completely explained, research has proved that the uptake of vaccine is influenced by effectiveness of the training, availability of the hepatitis vaccine (Bravo-Grande., 2021).

Summary

The study revealed that educational intervention lead to an overall positive attitude towards occupational hazards 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. The sample size is small due to limited resources for more and the large area involved hence the choice of a quasi experimental design. Self-reporting is associated with the possibility of bias.

Conclusion: A positive attitude towards occupational hazards by PHCWs can be achieved through educational intervention. The intervention has proved that educational intervention is sacrosanct to a positive behavioral attitude in the practice of occupational health by PHCWs.

RECOMMENDATIONS

1. Training and retraining of all PHCWs on the right attitude towards occupational hazards will help to improve the practice of occupational health.

2. All PHCWs should be educated on the need to have full immunization against Hep. B virus since being fully vaccinated was associated with good attitude

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.

Contributions to knowledge

1. The intervention has highlighted areas that need further studies in the future.
2. The study will help in contributing to the body of literature on the practice of occupational health through educational intervention.

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