



EFFECT OF EDUCATIONAL INTERVENTION ON KNOWLEDGE AND PERCEPTION OF MORTUARY WORKERS IN SELECTED HEALTH FACILITIES IN SOUTH-WEST NIGERIA (MORTUARY)

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ABSTRACT: Background: Mortuary workers' exposure to hazards is a serious public health issue, as consequences of these work-related risks do not only affect individuals who are directly at the receiving end, but also the impact ripples through their families, with potential emotional and financial burdens, and extends to employers who may face increased healthcare costs and workforce management challenges. Therefore, this study examined the effect of educational intervention on knowledge and perception of personal protective equipment among workers in selected health facilities in South-West, Nigeria. **METHODOLOGY:** Quasi-experimental research approach was employed for this study. A total of 10 mortuaries were selected in the two states out of the 46 facilities existing in Lagos and Osun by balloting. A sample size of 60 mortuary workers was using the Power formula. A random sampling technique was used to group the participants into an Experimental group (EG) and Control Group (CG). The intervention was implemented for 2 hours per day once a week for four weeks. Four workers were trained for 2 hours over a period of three days. A structured validated questionnaire with Cronbach's alpha coefficients ranging from 0.70 to 0.79 was used to collect data. Data were collected at baseline, immediate post-intervention and 12th week follow-up. Response rate was 100% for both IG and CG. Data were analysed using descriptive and inferential statistics at 5% level of significance. Effect size (ES) was computed to measure the magnitude of the intervention in IG. **RESULTS:** Findings showed that at baseline, there was no significant difference ($p > 0.05$) in the mean scores of PPE knowledge for Experimental Group (3.52 ± 0.33) and Control Group (3.69 ± 0.38). It also revealed that at baseline, there was no significant difference ($p > 0.05$) in the mean scores of PPE perception for experimental group (16.36 ± 0.73) and control group (16.15 ± 1.22). Furthermore, there was a significant difference ($p < 0.05$) in the mean scores of PPE knowledge between baseline for EG (3.52 ± 0.33) and 12th week follow-up (9.93 ± 0.05), as there was a significant difference ($p < 0.05$) in the mean scores of PPE perception between baseline for EG (16.15 ± 1.22) and 12th week follow-up (25.57 ± 0.48). There was also a significant difference ($p > 0.05$) in the knowledge and perception of PPE utilisation among mortuary workers in the control group and artisans in the experimental group at 12th follow-up, greatly due to the occupational-risk intervention program. **CONCLUSION:** The proper and sufficient use of PPE among mortuary workers is due to a variety of factors. This study affirmed that increase in knowledge and perception on usage of PPE among workers in selected health facilities are very crucial factors to be considered. The result of the analysis reveals that there were significant differences at 12th week follow-up between the control and experimental groups in all the variables measured. This result attests to effectiveness of the educational intervention program in improving the knowledge and perception of utilisation of PPE among mortuary workers in selected health facilities. This is evident in the statistical analysis which revealed that, there is a significant difference in the mean score of each of knowledge and perception from baseline period to immediate and follow-up stage based on the t-test.

KEYWORDS: Educational intervention, Mortuary workers, Practices of PPE, Utilisation of PPE.



INTRODUCTION

Mortuary workers' exposure to hazards is a serious public health issue, as consequences of these work-related risks do not only affect individuals who are directly at the receiving end, but also the impact ripples through their families, with potential emotional and financial burdens, and extends to employers who may face increased healthcare costs and workforce management challenges (Usman et al., 2021). Moreover, the broader community is not immune, as the compromised health and well-being of these essential workers can strain local healthcare systems and social support structures. On a national scale, addressing these occupational hazards becomes imperative to ensure the sustained well-being of the workforce, maintain public health, and uphold the ethical and professional standards of the mortuary industry (Usman et al., 2021).

The primary rationale behind the use of PPE is to create a robust barrier between the worker and potential contaminants or hazardous materials (Verbeek et al., 2020). Gloves, for instance, act as a protective shield against direct contact with bodily fluids and chemicals, preventing the transmission of infectious diseases and reducing the risk of dermatological issues. Masks and goggles provide a barrier against airborne pathogens and protect the eyes from splashes of fluids or chemicals. Aprons act as an additional layer of protection, safeguarding the body from potential splatters or spills (Verbeek et al., 2020). Hence, the employer must take all necessary steps to supply all needed PPE, teach employees, and enforce and monitor compliance for workers to comply with the use of these equipment (International Labour Organization, 2022).

Despite the importance of PPE, research has shown that the usage of PPE among mortuary workers is often inadequate. In a study conducted in Nigeria, it was found that only 42% of mortuary workers consistently used PPE while handling cadavers (Olufemi et al., 2022). This is a worrisome statistic as it indicates that the majority of mortuary workers are not adequately protected from exposure to hazardous materials. The inadequate use of PPE among mortuary workers is a critical problem that requires immediate attention. Not only does it put these workers at risk of exposure to hazardous materials, but it also poses a threat to the health and safety of the communities they serve (Olufemi et al., 2022). The inadequate use of PPE among mortuary workers is due to a variety of factors, including a lack of education and training on the proper usage, inadequate access, and cultural attitudes towards it. Many mortuary workers may not understand the importance of PPE or may view it as cumbersome or uncomfortable.

To address this problem, it is essential to understand the impact of educational interventions on knowledge and perception on the usage of PPE among mortuary workers. By investigating the impact of educational interventions on the usage of PPE, the study will provide valuable information for improving the health and safety of mortuary workers. The results of the study could be used to develop and implement effective strategies for promoting the widespread adoption of PPE, which would have a positive impact on the health and well-being of these workers. In addition, the study will also provide insights into the most effective methods for delivering educational interventions, which could have implications for promoting PPE usage among workers in other industries. By identifying the most effective strategies for promoting the usage of PPE, the study could be used to develop best practices that could be adopted by other organisations to improve the health and safety of their workers.



Lastly, the findings of this study carry substantial implications for policymakers and regulatory bodies involved in occupational safety and health. As mortuary practices are integral to public health, the insights gained from this research can inform the development and refinement of policies tailored to improve PPE adherence among mortuary workers. Policymakers will have access to evidence-based recommendations that can contribute to the formulation of more effective guidelines, thereby enhancing overall occupational safety standards within mortuary settings in South-West Nigeria.

METHODOLOGY

Study Design

The study employed a quasi-experimental design with one experimental group and one control group to determine the impact of an education intervention program on improving their level of knowledge and perception towards effective use of Personal Protective Equipment among mortuary workers in selected health facilities across selected states in South-West Nigeria. At baseline, data were collected from all groups in the study; a 4-week intervention was administered to the experimental group. The control group did not receive an intervention program but an equivalent beneficial health education unrelated to occupational-risk practice in the workplace. A total of 10 mortuaries were selected in the two states out of the 46 facilities existing in Lagos and Osun by balloting. A sample size of 60 mortuary workers was using the Power formula. A random sampling technique was used to group the participants into an Intervention Group (IG) and Control Group (CG).

The inclusion criteria for this study include eligible mortuaries workers who have been working at the health facilities for at least three months before being approached for the study in selected South-West states (Lagos and Osun); the workers in the mortuaries include mortuary attendants and embalmers who involved in handling and processing dead bodies. Two states were conveniently selected from the six states in South-West Nigeria due to their population and widespread number of mortuaries in respective states. Five mortuaries located within health facilities were selected by balloting from each state, giving a total of 10 mortuaries. 6 workers were randomly selected from each mortuary, based on the inclusion criteria stated above giving a total of 60 workers. And the workers recruited across two groups (experimental and control group) were assessed using a research instrument designed to obtain baseline data. The workers recruited for the experimental group were trained using the training manual designed for the study and at the end of the 4-week training, they were evaluated with the same instrument that was used for baseline assessment. Participants in the control group received training on another health-related subject and thereafter assessed using the same research instrument administered at the pre-intervention stage.

Research Instrument and Data Collection

The research method chosen for this study was quantitative in nature. To create a reliable and valid instrument for data collection, the researcher gathered information from various sources including a review of relevant literature, as well as examining instruments used in similar studies. With this information, an appropriate instrument was developed for use in collecting data from the participants. The instrument was designed to ensure that it aligns with the research objectives and the research questions. The instrument was a semi-structured,



participant-administered questionnaire, which solicited information on the demographic characteristics, knowledge and perception towards utilisation PPE . The same instrument was administered at baseline; immediate post intervention and 12-weeks follow up. Cronbach Alpha scores were generated for the individual constructs (knowledge=0.745, overall perception=0.798).

Table 1: Description of the Data Collection

Groups	Baseline Data	Interventions	Outcome Evaluation (end of intervention program)	Impact Evaluation(at 12 th weeks)
Control Group	O	-	O	O
Experimental Group	O	X	O	O

Key: X = Intervention

O = Outcome

Study Variables

1. Explanatory variables

For instance, sociodemographic factors such as age, gender, level of education, length of service, religion, and ethnic affiliations. Modifiable factors which determine utilisation of PPE among participants such as knowledge, perception, and self-efficacy among study participants.

2. Outcome variables

Utilisation of Personal Protective Equipment (PPE) among mortuary workers in selected health facilities in South-West Nigeria

Data Analysis

The data collected for the study was collated, entered and coded using the Statistical Product for Service Solutions (SPSS) version 23. The data was cleaned by running a frequency analysis on each item and checking responses to ensure that the values were accurately coded. Data was analysed using descriptive, and inferential statistics at 5% level of significance. Effect size (ES) was used to measure the magnitude of the intervention in the Experimental group.

Ethical Clearance

An application for ethical approval for this study was submitted to the Babcock University Research Ethics Committee. The purpose of the study was explained to all participants, after which verbal consent was given by each participant, while they also signed the consent forms. All participants were assured of anonymity and the confidentiality of the information received from them.



RESULTS

Comparison of the Socio-Demographic Characteristics of the Respondents among Control And Experimental Groups

The results in Table 2 show that 50 (83.33%) Males and 10 (16.67%) females are the participants present at baseline for both control and experimental groups. The mean age of respondents was $M=39.58 \pm 11.88$ years for the control group and $M=35.67 \pm 10.57$ years for the experimental group respectively. The control group age category is slightly skewed towards the older category compared to the experimental group and this difference is not significant with $p>0.05$ (see figure 4.1). The control group has a higher mean for years of work experience of 18.47 ± 11.35 while the experimental group has a mean of 11.90 ± 9.97 . The range (minimum and maximum recorded) of years of work experience is similar for both groups but in between in the control group, there are participants with more years of work experience, and this is significant with $p<0.05$.

On educational attainment, the majority (50% and 36.7%) of the participants in the control and experimental group respectively have secondary education. This is followed by those (26.67%) with primary education in the control group and 33.3% of participants with tertiary education identified with the experimental group. Non-formal education accounts for a total of 11.86% in both groups, and across both groups, primary education was 20.34% of the participants while the secondary and post-secondary (tertiary) education of participants were 44.07% and 26.93% respectively.

The Yoruba ethnic group formed a major number, 44(79.31%) of all ethnicities, and the results showed 80% of respondents of Yoruba origin in the control group while the experimental group followed a similar pattern over 73.3% of the participants who are of Yoruba origin. Participants of the Igbo origin were 2(6.70%) for the control group and 3(10%) for the experimental group, while respondents of Hausa origin were 3(5.17%) for both control and experimental groups in the study. For the marital status, married participants accounted for the majority 27(90%) and 17(56.7%) for control and experimental groups respectively, single was the second most represented group among the participants 1(3.3%) and 6(20%) for control and experimental groups respectively while divorce status accounted for 4(13.3%).

In summary, only the years of work experience (p -value=0.021) obtained through t-test analysis and marital status (0.006) obtained via chi-square showed a significant difference among the groups at $p<0.05$, while there was no significant difference for demographic factors such as Age obtained by t-test with p -value of 0.180, and others obtained through Chi-square test [gender (p -value=0.182), ethnicity (p -value=0.320), and educational level (p -value=0.287)].

**Table 4.1: Demographic Characteristics of the Participants in the Study for Each Group**

	Control N=30	Experimental N=30	Total	
Variable	N (%)	N (%)	N (%)	p-value
Age				0.180
<20	1(3.3)	2(6.5)	3(5.0)	
21-30	8(26.7)	10(33.3)	18(30.0)	
31-40	8(26.7)	9(30.0)	17(28.33)	
40>	13(43.3)	9(30.0)	22(36.67)	
Mean± SD	39.58 ± 11.88	35.67 ± 10.57	37.67 ± 11.33	
Work experience				
<5	2(6.5)	8(26.7)	10(16.4)	0.021*
6-15	12(38.7)	12(40.0)	24(39.3)	
16-25	9(29.0)	7(23.3)	16(26.2)	
26>	7(22.6)	3(10.0)	10(16.4)	
Mean± SD	18.47 ±11.35	11.90 ±9.97	15.18 ±11.09	
Gender:				
Male	27(90.0)	23(76.7)	50(83.33)	0.182
Female	3(10.0)	7(23.3)	10 (16.67)	
Educational attainment:				
Non-formal	2(6.67)	5(16.7)	7(11.86)	0.287
Primary	8(26.67)	4(13.3)	12(20.34)	
Secondary	15(50.0)	11(36.7)	26(44.07)	
Tertiary	5(16.67)	10(33.3)	15(26.93)	
Ethnicity				
Yoruba	24(80.0)	22(73.3)	46(79.31)	0.320
Igbo	2(6.7)	3(10.0)	5(8.62)	
Hausa	2(6.7)	1(3.30)	3(5.17)	
Others	2(6.7)	4(12.7)	6(12.90)	
Marital Status				0.006*
Single	1(3.30)	6(20.0)	7(11.67)	
Married	27(90.0)	17(56.7)	44(73.33)	
Divorced	0	4(13.3)	4(6.67)	
NA	2(6.70)	3(10.0)	5(8.33)	

-Comparing certain demographic characteristics to demonstrate matched groups at baseline

*Significant at $p < 0.05$

Evaluation of Control and Experimental Groups at Baseline

The result of this study demonstrates the computed mean and standard deviation for both control and experimental group at baseline. This gives an initial conditions or prevalence level in the target population especially in terms of knowledge level and practices. The participants' level of knowledge about usage of PPE is low with the control group having a knowledge mean score of 3.69 ± 1.91 while the experimental group have a knowledge score of 3.52 ± 1.81 on a



maximum point scale of 10. The difference in the level of knowledge between control and experimental groups respectively was not statistically significant at p-value of 0.728 (See Table 4.2).

Comparing the perception score at control (16.15±6.21) and experimental groups (16.36±3.84) with maximum point scale of 30 at p-value of 0.885 indicates that there is no significance difference between control and experimental groups (See table 4.2).

Table 3: Statistical Summary of Major Variable for Control and Experimental Groups at Baseline on Usage of PPE among Participants

Variables	Maximum Points on Scale of Measure	Baseline				
		Control Group N=30		Experimental Group N=30		
		$\bar{X}$ (SE)	$\pm$ SD	X(SE)	$\pm$ SD	p-value*
Knowledge	10	3.69(0.38)	1.91	3.52(0.33)	1.81	0.728
Perception	30	16.15(1.22)	6.21	16.36(0.73)	3.84	0.885

* Test of significance for an independent sample t-test between control group (CG) and experimental group (EG)

Evaluation between baseline and 12th week follow-up results for control group

On the account of the post-intervention evaluation for control group, knowledge of respondents at baseline (3.69±1.91) and 12th week follow-up (4.19±1.83) on a maximum point scale of 10 indicates no significant difference [ES 0.026(1.52 to 0.54)] with p-value at 0.341. The level of knowledge was still low. The perception level of the participants at baseline phase (16.15±6.21) and 12th week follow-up (16.96±4.92) is moderate on a maximum point scale of 30 and showed that no significant difference has occurred at the different selected stages and the effect size was insignificant [ES 1.31(4.01 to 3.98)] at p-value of 0.616.

Table 4: Evaluation of the Effect of the Intervention on Variables between Baseline and 12th Week Follow-up Results for Control Group

VARIABLES	Maximum Points on Scale of Measure	Control group				*ES (95%CI)	p-value
		Baseline N=30		12th week follow-up N=30			
		X(SE)	±SD	X (SE)	±SD		
Knowledge	10	3.69 (0.38)	1.91	4.19 (0.36)	1.83	0.26 (1.52 to 0.54)	0.341
Perception	30	16.15 (1.22)	6.21	16.96 (1.00)	4.92	1.31 (4.01 to 3.98)	0.616



***ES; effect size of the Immediate Post-intervention for control group comparing baseline control group sample mean scores Evaluation from Cohen's D, the corresponding 95% CI; and p-value is level of significance**

Evaluation of Control and Experimental Groups at 12th Week Follow-up

The result of the analysis reveals that there were significant differences at 12th week follow-up between the control and experimental groups in all the variables measured. This result attests to the efficacy of the educational intervention program in influencing the usage of PPE among workers in selected mortuaries. There was a high level of knowledge in the mean score of the participants in the experimental group (9.93 ± 0.25) compared to the control group (4.19 ± 1.83) which was still below average on a maximum point scale of 10. The p-value of 0.001 shows there is a significant difference in knowledge score of CG and EG with effect size of ES: 3.13(-6.43 to -5.05).

The perception mean score of the participants in the experimental group (25.57 ± 2.56) is higher compared to the control group (16.96 ± 4.92) which is at a moderate mean score on a maximum point scale of 30. The p-value of 0.001 shows there is a significant difference in knowledge score of CG and EG with effect size of ES: 3.11(-10.75 to -6.47).

Table 5: Evaluation of Variables Involved in Control and Experimental Groups at 12th Week Follow-up

Variable	Maximum Points on Scale of Measure	12th week Follow-up					
		Control Group N = 30		Experimental Group N = 30		*ES (95%CI)	*p-value
		$\bar{X}$ (SE)	$\pm$ SD	$\bar{X}$ (SE)	$\pm$ SD		
Knowledge	10	4.19(0.36)	1.83	9.93(0.05)	0.25	3.13(-6.43 to -5.05)	0.000
Perception	30	16.96 (1.00)	4.92	25.57(0.48)	2.56	3.11(-10.75 to -6.47)	0.000
* Test of significance for an independent sample t-test							

Evaluation of Baseline and 12th week Follow-up Values for Experimental Groups

The result compares the baseline and post intervention scores of the experimental group. The evaluated post-educational intervention mean score of knowledge of workers in selected mortuaries towards PPE on point scale of 10 was 9.93 ± 0.25 at 12th week follow-up compared to initial baseline mean score of 3.52 ± 1.81 .

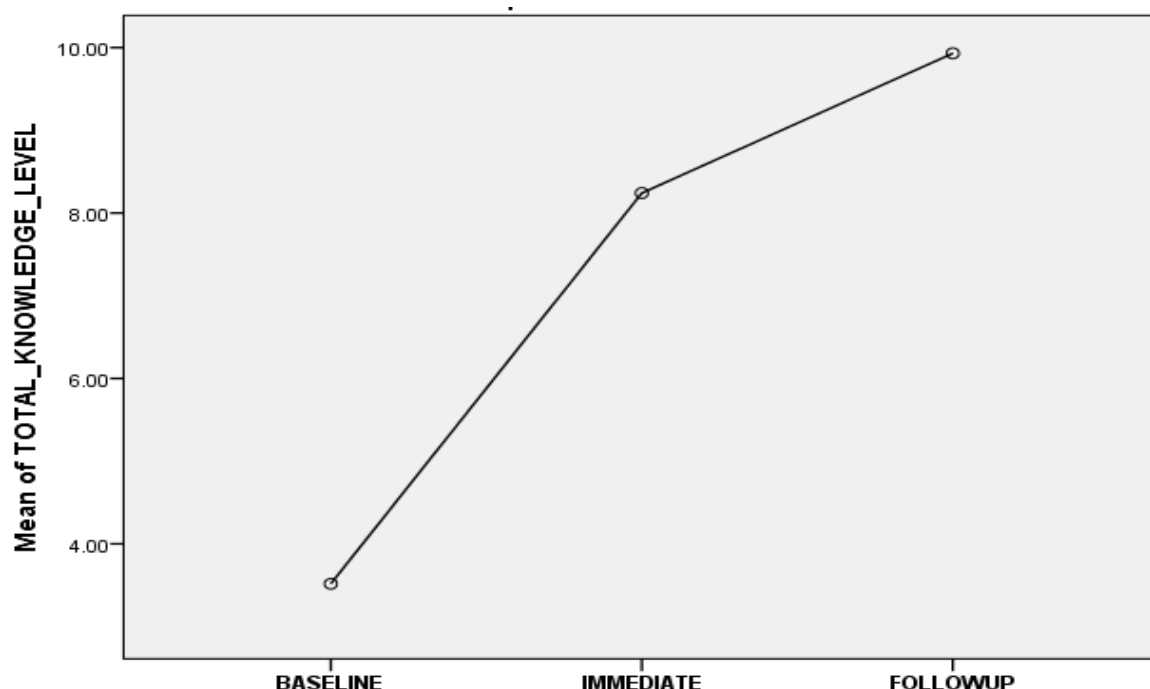
Considering the post-educational intervention on perception of workers in selected mortuaries in South-West Nigeria towards PPE, it was observed that the baseline result was a mean score of 16.36 ± 3.84 while at the 12th week follow-up phase of the study the mean score went high to 25.57 ± 2.55 on a maximum point scale of 30 with an effect size of 2.40 at 95% CI of -10.96 to -7.47; p-value of 0.001.

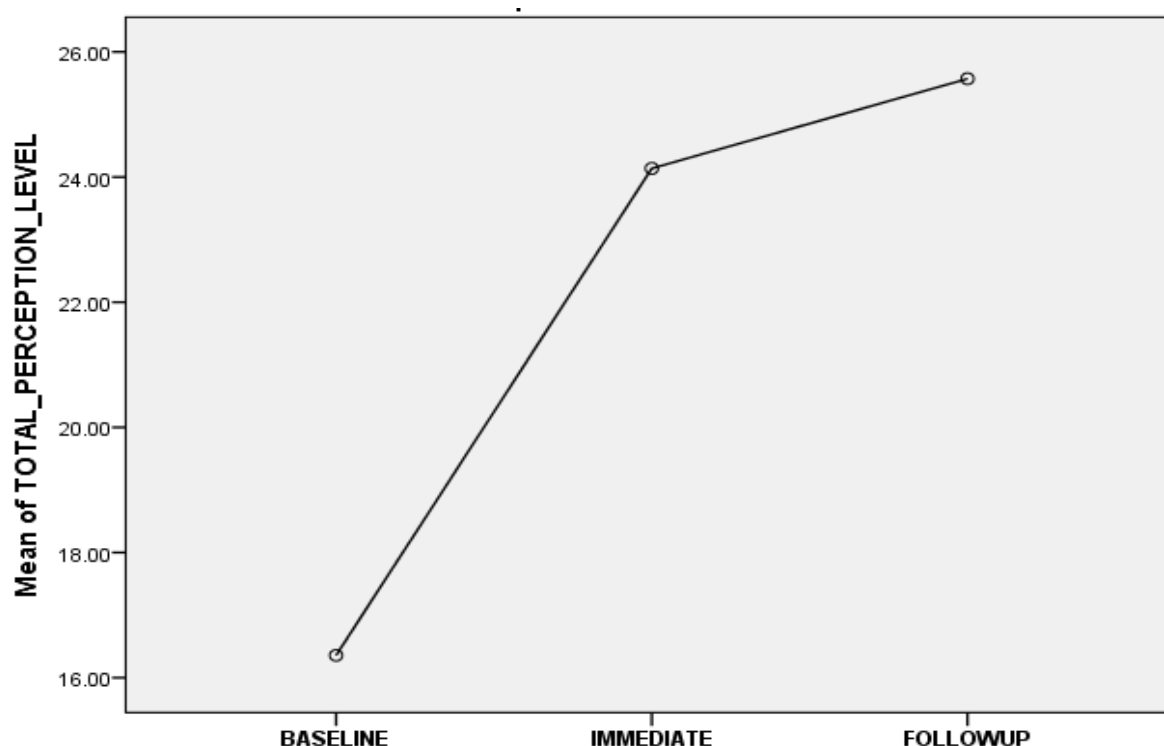


This study shows that there were significant differences and large effect sizes between baseline values and values at 12th week follow-up in all the variables measured among the experimental group. This eloquently demonstrates the effectiveness of educational intervention programs on the utilisation of PPE among mortuary workers.

Table 6: Statistical Analysis of Variables Involved in Educational Intervention on Utilisation of PPE at Baseline and 12th Week Follow-up Phase for the Experimental Group

		Experimental Group					
Variable	Maximum Points on Scale of Measure	Baseline N = 30		Follow-up N= 30		*ES (95% CI)	*p- value
		$\bar{X}$ (SE)	$\pm$ SD	$\bar{X}$ (SE)	$\pm$ SD		
Knowledge	10	3.52 (0.33)	1.81	9.93 (0.05)	0.25	3.55 (-7.09 to -5.72)	0.000
Perception	30	16.36 (0.73)	3.84	25.57 (0.48)	2.55	2.40 (-10.96 to -7.47)	0.000





DISCUSSION

The baseline level of knowledge of mortuary workers in selected health facilities in South-West Nigeria on Personal Protective Equipment (PPE) revealed that the participants' level of knowledge on utilisation of PPE across both groups was less than 40% with mean scores of 3.69 and 3.52 for control and experimental group respectively on a maximum point a scale of 10. This finding is lower than the result of a study of Ogunnowo et al. (2010) in which 59.2% of mortuary workers were aware of workplace dangers (Ogunnowo et al., 2010). This downturn suggests that knowledge and practice of PPE among mortuary workers will worsen if nothing is done in terms of intervention. The difference in the level of knowledge between control and experimental groups was not significant at p-value of 0.728. This finding should pose a concern to stakeholders and regulators.

The evaluation of post-educational intervention level of knowledge of mortuary workers in selected health facilities in South-West Nigeria on PPE showed a significant difference ($p < 0.05$) in knowledge due to the educational intervention. There was a high level of knowledge; the mean score of the participants in the experimental group was 9.93 compared to the control group 4.19 which was below average on a maximum point scale of 10. According to the participants after the intervention, a major consequence of non-use of PPE was infection for 100% of the participants in EG compared to 48% of the participants in CG. Therefore, there was a notable significant difference between the groups $p < 0.05$ at 12th week outcome evaluation. Another knowledge issue identified among others are the identification of latex gloves (35%), Nitrile gloves (38%) and waterproof aprons (21%) as the causes of allergies among the CG while 100% of EG claimed that allergies can result from Nitrile gloves.



At baseline, the perception of mortuary workers in selected health facilities in South-West Nigeria towards PPE was average with mean scores of 16.154 and 16.357 for control and experimental group respectively. The perception on utilisation of PPE between both groups did not show any statistical significance at the baseline assessment of the workers.

The results further show a consistent sharp elevation or increase in positive perception on utilisation of PPE among mortuary workers in selected health facilities from baseline to immediate intervention stage, and a further slight increase at 12th week follow-up outcome evaluation. Another research has shown that respondents identified HIV/AIDS (97.7%), TB (82%) and formalin-related illness were the risks they are likely to contract (Ogunnowo et al., 2010).

CONCLUSION

The proper and sufficient use of PPE among mortuary workers is due to a variety of factors. This study affirmed that increase in knowledge and perception on usage of PPE among workers in selected health facilities are very crucial factors to be considered. The result of the analysis reveals that there were significant differences at 12th week follow-up between the control and experimental groups in all the variables measured. This result attests to effectiveness of the educational intervention program in improving the knowledge and perception of utilisation of PPE among mortuary workers in selected health facilities. This is evident in the statistical analysis which revealed that, there is a significant difference in the mean score of each of knowledge and perception from baseline period to immediate and follow-up stage based on the t-test.

FUTURE RESEARCH

This study should be replicated to improve the level of utilisation of personal protective equipment among mortuary workers.

1. Training and workshops should be organised by the respective state ministry of health in collaboration with employers/management of the facilities with hands-on sessions to encourage improved utilisation of personal protective equipment among mortuary workers.
2. Animation pictures, instructional posters at strategic positions within each facility can also be used to encourage improved utilisation of PPE among mortuary workers.



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