

Assessment of Training on Acute Flaccid Paralysis Surveillance among Surveillance Officers in Ondo State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Authors AAF and EEI designed the study. Authors AMA and EEI performed the statistical analysis and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aim: We assessed the immediate impact of Acute Flaccid Paralysis (AFP) surveillance training on the knowledge of AFP surveillance among AFP surveillance personnel, and identify factors associated with changes in knowledge following the training.

Study Design: A descriptive cross-sectional study design was conducted.

Place and Duration of Study: A quasi-experimental, before-and-after study was conducted in Akure, Ondo State Nigeria in April, 2016.

Methodology: The training was conducted among 54 surveillance personnel which included the Disease Surveillance and Notification Officers (DSNOs) and assistants as well as the state surveillance officers. Agenda and training materials were supplied by the WHO country office (WCO), and adapted and modified in line with the present AFP surveillance challenges of the state.

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Data were obtained on the socio-demographic characteristics and knowledge of AFP surveillance; and analyzed using McNemar and Pearson Chi-square as well as paired and unpaired t-test, with the alpha level of significance set at .05.

Results: Majority (70.4%) of the participants were males with mean age of 42.9±9.2 years. Significantly, the mean score of post-test (40.0±5.0) was higher than that of pre-test (31.2±8.5), P= .001. The mean score of performance of the female participants was significantly higher at post-test (40.8±4.3) compared to the males (37.4 ±5.3) P= .017. Similarly, participants with more than 2 years' experience on AFP surveillance had higher mean score (40.9±4.4) at post-test compared to those with less than 2 years' experience (32.3±8.7) P= .046. Those that have received two or more trainings on AFP surveillance had higher mean score (40.9±4.4) at post-test compared to those that have never or have received a training on AFP (37.4±4.8) P = .011.

Conclusion: The training proved to be relevance at the time it was conducted as it impacted knowledge on the AFP surveillance personnel. However, there is the need to assess the correlation between knowledge and practice in subsequent surveillance performance.

Keywords: Acute flaccid paralysis; surveillance; disease surveillance and notification officers.

1. INTRODUCTION

Acute Flaccid Paralysis (AFP) surveillance system has become an established feature of the public health system that is essential for monitoring progress towards global polio eradication [1]. It entails detecting and investigating (including stool sample collection) AFP cases in children under 15 years of age and all cases of paralytic illness in persons of any age in whom a clinician suspects poliomyelitis. The AFP surveillance is useful in identifying and documenting the presence or absence of wild poliovirus (WPV) or Circulating Vaccine Derived Polio Virus (cVDPV) in the country, and is the most reliable tool to measure the quality and impact of immunization activities against polio. It is also crucial in providing evidence for the certification committee to confirm the absence of WPV and to certify the country as polio free [2].

In 1988, the World Health Assembly resolved to eradicate polio globally with the prevalence of polio cases reduced by over 99% i.e. from an estimated 350 000 cases in more than 125 endemic countries then, to 37 reported cases in 2016 [3]. As at early 2015, the countries endemic for polio were Afghanistan, India, Nigeria and Pakistan. However, Nigeria was removed formally from these countries on 26 October, 2015 following historic achievement of the country in interrupting the transmission of wild poliovirus for a period of 15 months [4]. The country was later re-listed, after WPV case was reported on August 10, 2016, in the north-eastern state of Borno, which has been severely affected by insurgency-related insecurity [5].

The World Health Assembly was able to achieve tremendous progress in polio eradication through

the Global Polio Eradication Initiative (GPEI) which aims to interrupt transmission of the wild poliovirus as soon as possible, achieve certification of global polio eradication, and contribute to health system development and strengthening routine immunization and surveillance for communicable diseases. Among the major strategies of the GPEI, is the establishment of high-quality AFP surveillance with timely investigation of every case. A reliable AFP surveillance data will guide targeted immunization activities in areas with continued poliovirus circulation. This is also important in measuring how effective routine and supplementary Oral Polio Vaccine (OPV) immunization has succeeded in decreasing poliovirus transmission [6].

As Nigeria approaches polio certification, there is the need to maintain a sensitive AFP surveillance that will detect all cases of AFP through all reporting channels (clinician, focal and non-focal reporting sites and community informants) in the AFP surveillance network. For this to be achieved, clinicians and other AFP field surveillance personnel must be knowledgeable about the standard AFP case definition, the differential diagnosis, when and how to report AFP cases and to whom AFP cases should be reported to when detected. Previous rapid assessment of surveillance in other high-risk states consistently found knowledge gaps among surveillance personnel, especially those at the Local Government Area (LGA) and health facility levels, to be one of the key challenges to quality surveillance [7,8].

The quality of the national and state-level disease surveillance system remains a priority in the eradication of infectious disease [4]. One

foundational method at which this quality can be improved is through the conduct of assessment of training and re-training of surveillance officers in order to identify gaps that may limit the impact of the training among them. In this study, a cascaded training on AFP surveillance sub-systems of the Integrated Diseases Surveillance and Response (IDSR) was conducted from the state to the LGA level between 6th and 7th April, 2016 in Ondo State, in order to enhance the capacity of the surveillance personnel to perform their roles in AFP surveillance. The training was assessed to document its immediate impact on the knowledge of AFP surveillance among the participants, and to identify factors associated with changes in knowledge following the training. This assessment will help identify gaps in areas relating to knowledge of; the standard case definition and differential diagnosis of AFP and other IDSR diseases, the conduct of quality active surveillance, AFP stool collection process, and proper documentation of all AFP surveillance activities.

2. MATERIALS AND METHODS

2.1 Study Area

Ondo State, one of the 36 states in Nigeria, was created on 3 February 1976 from the former Western States with its headquarter in Akure, the state capital. The State covers an area of approximately 788.723 square Kilometres (Km²) and is bounded in the North by Ekiti and Kogi States, in the East by Edo State, in the west by Osun and Ogun States and in the south by the Atlantic Ocean [9]. The major occupations of the inhabitants include farming, fishing and trading. The people of the State are predominantly Yorubas who speak various dialects of the Yoruba language such as the Akoko, Akure, Apoi, Idanre, Ikale, Ilaje, Ondo and the Owo and a minority speaking the Ijaw Language. The State has a population of 3,441,024 according to the 2006 census and accounts for 2.5 percent of Nigeria's population [10].

Ondo State has 18 LGAs and is located in the South western zone of Nigeria. For administrative convenience, it is divided into three political zones: Ondo north, south and central. The administration is organized at state and local levels of government. The LGA Primary Health Care (PHC) Department is directly responsible for disease surveillance activities at the LGAs and coordinated by the State-level Surveillance Officers.

2.2 Study Population

Participants were DSNOs and their respective assistants from the 18 LGAs in Ondo state and state AFP surveillance officers.

2.3 Study Design

A quasi-experimental, before-and-after interventional study design was used. The intervention training took place in Akure, Ondo State in April, 2016. Agenda and training materials were supplied by the WHO country office (WCO), and adapted and modified in line with the present AFP surveillance challenges of the state. The training was conducted using English language as a means of communication, with training materials made available for the participants. Lectures were essentially participatory and opportunity was provided for sharing experience among participants. Also, a field trip session was made to two health facilities (General Hospital, Idanre and comprehensive health centre) for practical demonstration of the conduct of quality active surveillance and documentation of AFP surveillance activities by participants.

2.4 Data Collection, Management, and Analysis

Data were obtained pre and post training on socio-demographic characteristics, experience of AFP surveillance, knowledge of AFP surveillance and overall training evaluation by participants using a semi-structured, self-administered questionnaire. The data were entered into the Microsoft excel spreadsheet and analyzed using Statistical Package for Social Science (SPSS) version 20. Aggregate scores were calculated giving a maximum score of 50. These were then categorized as fail (<35) and pass (≥35) respectively. Descriptive analyses using the mean and proportion were computed. The proportion of participants with fail and pass were calculated for both pre- and post-tests. The McNemar Chi-square test for paired data was used to test the null hypothesis that there were no differences between the proportion of participants who passed the pre- and post-tests. Also, the paired t-test was used to test for significant differences between the mean scores at the pre- and post-tests. The associations between selected socio-demographic variables and knowledge score at pre-and post-test were determined and tests of significance performed using appropriate test statistic, unpaired t-test and Pearson Chi-Square test, for means and proportions respectively. The level of significance

for the statistical tests was set at an alpha level of $P < 0.05$.

3. RESULTS

3.1 Socio-demographic Characteristics of Respondents

A total of 54 surveillance officers, including (18; 33.0% each) DSNOs, assistant DSNOs and state surveillance officers participated in the training. The mean age of the participants was 42.9 (± 9.2), and 70.4% were female. More than two-third (75.9%) of the respondents were married; 47 (87.0%) had completed tertiary level of education and 33 (61.1%) had been working as a surveillance officer for more than 24 months

(Table 1). More than one-quarter (37.0%) of the participants were trained twice on AFP surveillance, and 81.5% had been trained in 2015.

3.2 Impact of Training on Respondents' Knowledge of AFP Surveillance

As shown in Table 2, 20 (37%) of the participants passed the pre-test compared to 47 (87%) that passed the post-test ($P = .001$). The median score of post-test was 7.5 points higher than that of pre-test, and a significant mean paired improvement score of 8.8 was observed between the pre- (31.2) and post-tests (40) (paired t-test=8.239, $P = .001$).

Table 1. Socio-demographic characteristics of respondents

	Frequency (n=54)	Percentage (%)
Age		
25-34	11	20.4
35-44	16	29.6
≥ 45	27	50.0
Mean (SD)	42.9 (± 9.2)	
Gender		
Male	16	29.6
Female	38	70.4
Marital status		
Single	13	24.1
Married	41	75.9
Highest level of education		
Secondary	1	1.9
Tertiary	47	87.0
Postgraduate	6	11.1
Professional qualification		
Medical officers	9	16.7
Nurse	9	16.7
CHW	30	55.6
MRO	6	11.0
Designation		
Assistant DSNO	18	33.3
DSNO	18	33.3
State surveillance officer	18	33.3
Experience at work (in month)		
< 15	11	20.4
15-24	10	18.5
≥ 25	33	61.1
Number of training on AFP surveillance		
None	5	9.3
1	12	22.2
2	20	37.0
3	7	13.0
≥ 4	10	18.5
Year last trained on AFP surveillance		
2014	1	1.8
2015	44	81.5
2016	4	7.4
None	5	9.3

CHEW (Community Health Extension Worker); MRO (Medical Record Officer)

Significantly, female participants performed better than the male during the pre- and post-tests, with mean scores of 40.8±4.3 vs 37.4 ±5.3, and 31.7±8.9 vs 29.8 ±7.8 respectively; however, these differences were only statistically significant in post-test (pre-test p=0.470; post-test p=0.017) (Table 3). Also, the number of period for which participants had worked as a surveillance officer and the number of relevant trainings on AFP surveillance ever attended were

significantly associated with their performances in pre and post-tests.

Fig. 1 showed the overall ratings of the training by participants. More than 60% of the participants rated the training as excellent with respect to the venue/training material, schedule, participation, facilitation, training content and meal.

Table 2. Impact of training on respondents' knowledge of AFP surveillance

Respondents' performance	Pre-test	Post-test	Test statistics & p-value
Pass	20 (37.0)	47 (87.0)	McNemar Chi ² =23.310
Fail	34 (63.0)	7 (13.0)	P= .001
Mean (SD)	31.2 (8.5)	40.0 (5.0)	Paired t-test= 8.239
Median	32.5	40.0	P= .001

SD= Standard Deviation

Table 3. Factors associated with knowledge of AFP surveillance at pre- and post-tests

Respondents characteristics	Pre-test Mean score (SD)	Post-test Mean score (SD)
Age		
<45	28.9 (±9.7)	38.8 (±4.9)
≥45	33.3 (±6.8)	40.9 (±4.5)
Test Statistics; p-value	*t-test= -0.9; p=0.059	t-test= -1.6; p=0.113
Gender		
Male	29.8 (±7.8)	37.4 (±5.3)
Female	31.7 (±8.9)	40.8 (±4.3)
	t-test= -0.7; p=0.470	t-test = -2.5; p=0.017
Marital status		
Single	30.2 (±9.4)	41.5 (±5.6)
Married	31.4 (±8.4)	39.3 (±4.5)
	*t-test= -0.5; p=0.643	t-test= 1.5; p= 0.139
Highest level of education		
Tertiary and lower	30.7 (±8.9)	39.5 (±4.7)
Post graduate	34.3 (±4.8)	42.0 (±5.8)
	*t-test= -0.9; p=0.338	t-test= -1.2; p= 0.241
Professional qualification		
Nurse/MO/MRO	29.8 (±9.6)	40.8 (±4.2)
CHW	32.2 (±7.7)	39.0 (±5.1)
	*t-test= -1.0; p=0.311	t-test=1.4; p=0.165
Designation		
Assistant DSNO	34.0 (±7.7)	39.9 (±4.4)
DSNO and State surveillance officer	29.7 (±8.7)	39.8 (±5.1)
	*t-test= -1.8; p-value=0.083	t-test =0.2; p=0.890
Experience at work (in month)		
<25	27.5 (±7.8)	38.2 (±4.8)
≥25	33.4 (±8.4)	40.8 (±4.6)
	t-test= -2.6; p=0.012	t-test= -2.0; p=0.046*
Number of training on AFP surveillance		
None and 1	28.6 (±8.0)	37.4 (±4.8)
≥2	32.3 (±8.7)	40.9 (±4.4)
	t= -1.5; p= .142	t= -2.6; p= .011

** Paired t-test*

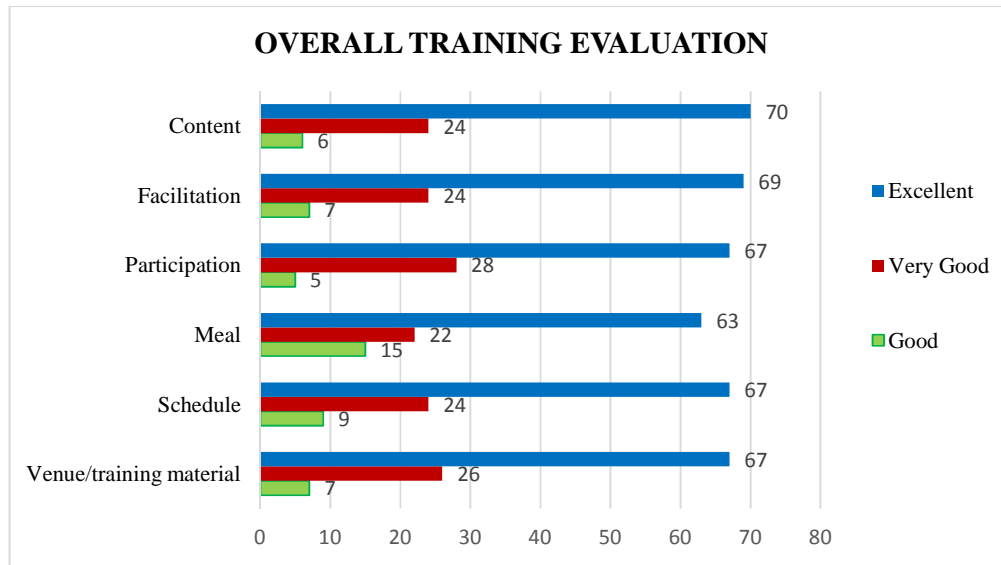


Fig. 1. Overall evaluation of AFP training by participants

4. DISCUSSION

The need to conduct assessment of training and re-training of surveillance officers should form one of the foundational methods of improving the quality of any national or state-level disease surveillance system. It is important to conduct immediate evaluation of AFP training as done in other diseases' eradication program [4], in order to identify gaps that may limit the impact of the training among personnel. This study focused on the impact of AFP surveillance training on the knowledge of standard case definition, differential diagnosis of AFP and other IDSR diseases; the conduct of quality active surveillance, AFP stool collection process; and the need for proper documentation of all AFP surveillance activities among AFP surveillance officers in Ondo State. Factors associated with changes in knowledge following the training were also identified.

In this study, we observed that high proportion of the participants were in the older age group of more than 44 years with the females highly represented. This finding is consistent with that reported among DSNOs in Osun State, Nigeria [11] and among private medical doctors in Ondo State, Nigeria [12]. The finding about the age group suggests that the participants might have spent substantial years as government workers before being selected as AFP surveillance personnel. This is coupled with the fact that high proportion of the participants had tertiary (as well as post tertiary) education with more than two

years' experience in AFP surveillance activities. These are strengths to implementation of AFP surveillance activities in the state. Similar reports were also made in other related studies [11,12]. However, the study conducted in Osun State reported higher working experience of more than 10 years among the surveillance personnel compared to this study (2 years) [11].

The mean score of the participants was high at pre-test, indicating that participants were conversant with AFP surveillance requirements. This report contradicts a similar study finding conducted in Osun state of Nigeria, where a very low pre-test mean knowledge score was reported [13]. This difference may be attributed to the differences in sample sizes and the type of training conducted. The study in Osun State has lower sample size of 31 participants compared to this study (54), which may reduce the significance level of the finding. Also, the study in Osun State focused on yellow fever training which the surveillance personnel may not be conversant with hence, influencing training outcome. In this study, an increase in the mean score was observed in the post-test compared to the pre-test, which suggests that trainings focused on AFP will be needed to keep the surveillance personnel abreast of knowledge of the disease surveillance in the state.

Factors that significantly influenced the performance of the participants include sex, years of experience as AFP surveillance personnel and number of training on AFP that

participants have ever attended. The finding of this study corroborates previous study that found the females' participants to perform better than the males [13]. However, previous report among the same group did not show any significant difference in the post test mean score [11]. In most part of the country, surveillance activities have been equally well performed by DSNOs of either sex. However, in certain part of the country, females are usually recommended as either immunization officers or vaccinators due to socio cultural consideration [14].

Participants with more than two years' experience as AFP surveillance personnel got high scores in both pre- and post-tests compared to those with lower numbers of years. Previous study among surveillance personnel in Osun State also made similar observation [13]. This suggests that surveillance personnel should be retain more in their activities as surveillance officer in order for them to acquire more years of experience, and caution should be exercise in changing this category of officers as it may affect the surveillance activities in the LGA negatively.

Furthermore, this study found that participants that had received more than one training on AFP surveillance significantly performed better in post-test only. This finding is not consistent with that of previous studies in Osun State that assessed the effect of training of DSNOs on AFP surveillance [11], and determined the immediate impact of yellow fever training on the knowledge of surveillance officers [13]. This finding suggest a need for periodic training of the surveillance officers to keep them abreast of knowledge of disease surveillance. Equally important is the measure of surveillance performance indicators and sensitivity to detect transmission or the absence of transmission of the condition.

5. CONCLUSION

In overall, the participants' rating of the training was excellence based on the areas evaluated. The tool used for the evaluation may, however, be improved in order to capture other areas such as the relevance of topic and depth of discussion. The main strengths in this training included the availability of; enough time to plan, training materials and agenda, resourceful persons that had themselves undergone training previously. The training was successful and proved to be relevance at the time it was conducted as it impacted knowledge on participants who are State and LGA surveillance

officers. However, there is the need to assess the correlation between knowledge and practice in subsequent surveillance performance. Also, regular trainings are recommended for the officers, particularly those with few years of experience in AFP surveillance.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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