EVALUATION OF GUINEA WORM ERADICATION PROGRAMME IN EBONYI STATE, NIGERIA

M. N. Nnamani
Department of Health & Physical Education
Enugu State University of Science & Technology,
Enugu, NIGERIA.
nna_bueze@yahoo.com

U.C. Nnabueze
Department of Health & Physical Education
Enugu State University of Science & Technology,
Enugu, NIGERIA.
ngozirita2003@yahoo.com

ABSTRACT

This study was aimed at evaluating the Nigeria Guinea Worm Eradication Programme in Ebonyi State Nigeria. Six research questions and one hypothesis were formulated to guide the study. The descriptive survey research design was used. The sample for the study was 398 respondents purposively selected from Ebonyi state (277 from two rural areas and 111 from Abakiliki urban). A 40 item questionnaire was the instrument used for data collection. The reliability of the instrument was determined using Cronbach's Alpha method and reliability co-efficient of 0.97 indicating high reliability of the instrument was established, Mean score and grand mean were used to answer the research question; while t-test statistics was used to test the hypothesis at .05 level of significance and 1.96 critical values. The findings of the study indicate that Nigerian Guinea worm Eradication programme (NIGEP), carried on health education, provided safe drinking water, supplied filters, treated eligible ponds with abate chemical, contained cases and carried out surveillance on guinea worm in Ebonyi State to a great extent. Consequently, recommendations were made including that NIGEP should intensify case containment strategy and active surveillance throughout Ebonyi State to guard against importation of guinea worm disease, until the entire endemic countries are certified free from the disease.

Keywords: Dracunculiasis, Eradication Programme, Safe drinking water, Cyclops, Health Education.

INTRODUCTION

Dracunculiasis or dracontiasis otherwise known as Guinea worm disease is one of the oldest and largest parasitic diseases known to man. The disease affects people living in rural or remote areas where safe water supply is lacking or scarcely available (Nweke, 2006). People contract guinea worm by drinking water contaminated with a microscopic organism called cyclops or corpepod, which live in ponds or stagnant water. These infected cyclops contain the third stage (larvae) of the worm, which is released in the stomach of the victim when ingested and the cycle continues (Nweke, 2004; Barry 2007).

The adult female guinea worm measuring up to a metre long and 2mm across carries 1-3 million embryos. It migrates through its victim's body and eventually perforates the skin usually at the ankle or feet causing intensely painful swelling, blistering and ulceration where it emerges. Whenever an infected person steps into water, the worm expels thousands of its embryos, a process that continues for up to three weeks. Hence, humans are the only reservoir of infection (Nweke, 2000; Barry, 2007). Some unhealthy behaviour responsible to guinea worm transmission include wading in ponds or surface water by victims with open ulcer and emerging worm resulting in the release of the larvae thereby contaminating the water. Drinking the pond water which is contaminated directly from the pond also encourages guinea worm infection. Many a time, this is done by farmer's enroute their farms. Thus productive adult farmers, who need to drink large volumes of water while at work in the farm, which most often drink direct from the ponds are afflicted. The young ones who assist in the farm are also afflicted. Guinea worm disease does not only maim the victim, but it also has great economic consequences. The economic loss implication of the guinea worm disease can be understood from a study carried out in Anambra, Benue, Cross River and Imo State by Edungbola, Braide, Nwosu, Arikpo, Germade, Ayami & De Rroy (1987) which reported that the annual loss of

rice production profit alone in the area due to guinea worm was to the tune of N140 Million ($20 Million). A total of 2,691 cases were reported in Ebonyi State in 1998 (Nkwuda, 2000).

Sadiq (1993) stated that 653,620 people were affected by guinea worm disease in Nigeria, in 1987 alone. Earlier on, Nwosu, Ifezuke & Ayami (1982) reported that 40-90% of adult in each household were incapacitated for an average of three to four weeks during 1978/79 guinea worm season in Abakakiliki (Ebonyi State) and surrounding. This implied that the affected persons did not participate in farming activities; resulting to decrease in economic productive activities with deepening of poverty and underdevelopment of the area which depends mainly on farming as the sole means of livelihood. As a result of the guinea worm scourge, various preventive and intervention measures had been undertaken by voluntary individuals, community efforts, governmental, (including Ebonyi State Ministry of Health) and non governmental agencies to exterminate the disease in Ebonyi State and Nigeria at large. According to Wolfe (2007) the global campaign to eradicate Dracontiasis began with an initiative taken at the centre for Disease Control and prevention (CDC), Atlanta Georgia in 1980. However, it was in 1985, that Dracontiasis was confirmed to be present throughout Nigeria. Consequently in August 1986, the then Anambra State (from where, the present Enugu and Ebonyi States were created). Ministry of Health under Professor A.B.C. Nwosu initiated the eradication campaign by establishing the first ever Guinea worm eradication task force. The task force was launched on 20th December 1986 at Effium, Ohaukwu LGA in the present Ebonyi State by the former Minister of health, Professor Olukoye Ransome Kuti. In 1988 the federal government of Nigeria established the Nigeria Guinea Worm Eradication Programme (NIGEP) with the mandate to eradicate guinea worm disease nationwide. This was after the federal government signed a memorandum of understanding with former United States' President, Jimmy "Carter's Global 2000" in August 1988 (Nweke, 2004). Other international agencies involved in the eradication efforts are UNICEF, UNDP, CDC, the Bill and Melinda Gate's Foundation and many other donors and non-governmental organizations (Wolfe, 2007).Since that time, various intervention measures have been put in place for the eradication of dracontiasis.

The following objectives of NIGEP serve as the main thrust of the present evaluation exercise: 1) Health education and community mobilization; 2) Provision of safe drinking water, 3) Use of household filters to remove the Cyclops, intermediate host, 4) Vector control with Temophos (Abate); 5) Case management and 6) Surveillance and reporting. For managerial convenience, NIGEP divided Nigeria into three zones with an over all national coordinator- North west Zone with headquarters at Ilorin, South East Zone with headquarters at Calabar and South West Zone with the headquarters at Ibadan. The South East zone is made up of Anambra, Abia, Akwa Ibom, Bayelsa, Cross River, Enugu and Imo State. They constituted task forces at National, State, Local Government and village levels through which they operated. NIGEP uses a collaborative approach in its fight against guinea worm as they work with national and international agencies. Guinea worm eradication is being achieved through grassroots public health initiatives involving thousands of village volunteers. Evaluation has been described by Onuchukwu (2006) as the end product of a process of assessing predetermined objectives. Therefore ascertaining the extent to which NIGEP has achieved its pre-determined objectives in Ebonyi State will be accomplished by this study.

STATEMENT OF THE PROBLEM

Guinea worm disease surfaces each year in Ebonyi State during the agricultural season in impoverished rural villages where the inhabitants are dependent on unsafe water. This results to months of crippling pain to those affected, leaving its adult victims unable to till the fields or tend their children. Furthermore, its child victims are rendered unable to attend school or go for immunization. This reduces the economic, physical, social and emotional status of affected people, by effectively crushing the key building blocks of poor rural people as year after year the disease cripples their attempt to emerge from their status of underdevelopment and poverty. In 1986 the Nigeria guinea worm eradication programme (NIGEP) was launched with the aim of eradicating guinea worm in Nigeria by the year 1995. The fact that this target date was not met and cases of guinea worm disease were still being reported in the endemic areas in Nigeria especially Ebonyi State in particular runs contrary to the target of WHO Geneva declaration pledging to wipe out the parasite by 2009.

One of then wonders the extent to which NIGEP has been effective in working towards its set objective. Hence this creates a gap to be filled by this has present study. This study specifically aimed at evaluating the extent to which NIGEP eradicated guinea worm in Ebonyi State. Hence the following research questions were posed. To what extent has NIGEP:

1. Carried the eradication of guinea worm in Ebonyi State through health education?
2. Provided safe drinking water in Ebonyi State?
3. Distributed filters to households in Ebonyi State?
4. Treated eligible ponds with Abate chemical in Ebonyi State?
5. Contained surveillance on guinea worm disease in Ebonyi State?

The following null hypothesis (Ho) was tested at 05 level of significance and at 386 degree of freedom:

Ho_1: there is no significant difference in the mean responses of the rural and urban respondents on the extent to which NIGEP has provided safe drinking water to the people in Ebonyi State.

RESEARCH METHOD

The descriptive survey research design was utilized for the study because generalizations were made over the entire population based on the analysis of data collected from a sample deemed to be representative of the population in their natural setting (Nwana, 1986; Uzoagulu 1998). The population for the study comprised the resident of the 10 Local Government Areas (Afikpo North, Afikpo south, Ohaozara, Onicha, Abakiliki Nzza, Ikwo, Ishielu, Izzi, and Ohaukwu) and Ebonyi urban. Out of the ten LGAs in Ebonyi State, two Afikpo and Ezza were purposively selected to represent the rural location (one from two out of the three education zones); while Abakiliki, the state capital was chosen to represent the urban location respectively. From the two LGAs that represent the rural location one community each was chosen, thus Ohaisu in Afikpo and Amuzu in Ezza respectively.

Convenience sampling was employed to draw 138 people from Ohaisu in Afikpo; 139 from Amuzu in Ezza; and 111 from Abakiliki Township respectively. This gave a total of 388 persons that were used for the study. The instrument used for data collection was a structured questionnaire developed by the researcher. The questionnaire consisted of two sections (A and B). Section A contained information regarding the gender and location of the respondents; while Section B with six parts (I - VI) was arranged in a 4 points rating scale with 40 close-ended questions. The instrument was face validated by three colleagues: two from Health and Physical Education Department and one from Science and Computer Education Department, all in the Faculty of Education, Enugu State University of Science Technology, Enugu. Reliability of the instrument was determined by administering the instrument to thirty persons from Nume in Nkanu East Local Government Area of Enugu State, who though did not form part of the study population. But shared similar characteristics by virtue of the fact that it is one of the guinea worm endemic areas in Enugu state; a neighboring state and which with Ebonyi state part of the then Anambra state was formerly. The questionnaire was administered to each respondent and the data collected was analyzed to determine the internal consistency of the items using Cronbach's Alpha. The co-efficient of reliability obtained was 0.97 which indicated high reliability of the instrument. The instrument was personally administered by the researcher with two research assistants in the two selected LGA's and Abakiliki in Ebonyi State. Data relating to the research questions were analyzed using mean and grand mean. The real limit of numbers was used. Hence 3.50 – above Very Great Extent (VGE); 2.50 – 3.49 Great Extents (GE); 1.50 – 2.49 Low Extent (LE) and below – 1.49 Very Low Extent (VLE). The hypotheses were tested at. 05 level of significance, using t-test statistics. The decision rule in respect of the hypothesis was that the nuII hypothesis was rejected if t- calculated is greater than or equal to t-critical at .05 level of significance and at 386 degrees of freedom otherwise, the null hypothesis is accepted.

RESULTS

Table 1. The extent to which NIGEP eradicated guinea worm in Ebonyi State through health education N = 388

S/N	Item	$\overline{X}$	SD	Decision
1.	Information on guinea worm disease are provided by NIGEP	V3.67	0.67	GE
2.	Villagers are educated on the causes of guinea worm disease (GWD)	V3.96	0.27	GE
3.	Residents in guinea worm endemic are offered health education on the Preventive Measures by NIGEP	3.94	0.36	VGE
4.	Health education are offered on the treatment of GWD by NIGEP	3.95	0.318	VGE
5.	People in the communities are thought to identify signs and symptoms of GWD	3.82	0.60	VGE
6.	The mode of guinea worm transmission is thought by NIGEP	3.87	0.60	VGE
7.	The people are persuaded to change their behavior through Innovative health education by NIGEP.	3.24	0.10	VGE
	Grand Mean	3.77	0.26	VGE

In table 1 the respondents indicates that NIGEP propagates information on guinea worm disease to a very great extent. (Grandmean = 3.77)

Table 2. Mean responses of the extent to which NIGEP provided safe drinking water In Ebonyi State. N = 388

S/N	Item	$\overline{X}$	SD	Decision
8.	NIGEP supplies pipe-borne water in Ebonyi State	1.19	0.54	VLE
9.	NIGEP provides hand-dug wells and boreholes in GWE area	3.75	0.53	VGE
10.	Open water sources are protected	3.18	0.97	VGE
11.	NIGEP repairs hand-dug wells and bore-holes	2.64	1.14	VGE
12.	NIGEP maintain taps and hand-dug well	3.61	0.70	VGE
13.	Villagers in endemic areas have access to water supply	3.97	0.24	VGE
14.	People are taught by NICEP to boil drinking water	2.79	1.07	VGE
	Grand Mean	3.02	0.95	VGE

Table 2 shows that NIGEP supplies pipe-borne water to the people in Ebonyi state area to a low extent (item 8; mean = 1.19). Thus most people do not enjoy pipe bone water as a source of water supply. On the other hand, the other items 9, 10, 11, 12, 13 and 14 had mean scores of 3.75, 3.18,

2.64, 3.61, 3.97 and 2.79 respectively. However, the grand mean of 3.02 shows that NIGEP provides safe drinking water to the residents of guinea worm endemic area to a great extent.

Table 3. Mean responses on the extent of which NIGEP distributed water filters people in Ebonyi Sate. N = 388

S/N	Item	$\overline{X}$	SD	Decision
15.	NIGEP provides water filters to households	3.81	0.54	VGE
16.	NIGEP encourages the people to filter water every time	3.75	0.63	VGE
17.	Residents in Ebonyi State use water filters provided by NIGEP	3.82	0.55	VGE
18.	NIGEP inform the people on the best methods of using water filers	3.99	0.13	VGE
19.	Residents in Ebonyi State are informed of the benefits of using water filters	3.81	0.54	VGE
20.	People are informed by NIGEP on the protection and safe keeping of water filters	3.72	0.68	VGE
	Grand Mean	3.78	0.137	VGE

Implies that there is adequate supply of filters by NIGEP. The grand mean of 3.82 also shows that NIGEP makes availability of filter for the people in Ebonyi State to a very great extent.

Table 4. Mean responses of the extent to which NIGEP treated eligible ponds with abate chemical in Ebonyi State. N = 388

S/N	Item	$\overline{X}$	SD	Decision
21.	NIGEP inform people on the use of abatechemical	3.53	0.84	VLE
22.	The community members know the safety of abate chemical	3.74	0.49	VGE
23.	The people show their acceptance in treating the eligible ponds with abate chemical	3.85	0.59	VGE
24.	All eligible ponds is treated with abate chemical fortnightly by NIGEP	2.58	1.13	GE
25.	NIGEP often treat eligible ponds with abate chemical	2.58	1.13	GE
26.	NIGEP have adequate supply of abate chemical for pond treatment	3.88	0.47	VGE
27.	NIGEP inform the people the time scheduled for application of abate chemical to encourage them gather enough water	2.98	1.23	GE
	Grand Mean	3.08	0.96	GE

In table 4 above, responses to items 21, 22, 23, 24, 25, 26 and 27 with means of 3.53, 3.74, 3.85, 2.58, 3.88 and 2.98 respectively agreed that NIGEP treats eligible ponds with abate chemical in Ebonyi State a great extent (Grand Mean = 3.15).

Table 5. Mean responses of the extent to which NIGEP contained the cases of guinea worm in the endemic areas of Ebonyi State. N = 388

S/N	Item	$\overline{X}$	SD	Decision
28.	Information is provided to the people about case containment strategy	2.59	1.14	GE
29.	NIGEP trains village based health workers for early detection of cases	2.94	1.07	GE
30.	NIGEP detects cases of guinea worm disease	3.56	0.87	VGE
31.	NIGEP treats the detected cases to eliminate possibility of further transmission	2.65	1.13	GE
32.	Infected patients who agrees to be quarantined while the worm is emerging are given cash reward by NIGEP	4.00	0.00	VGE
33.	Quarantined patient receive free food and care during the period from NIGEP	4.00	0.00	VGE
	Grand Mean	3.98	0.96	GE

Table 5 shows that the respondents indicate that NIGEP provide information about case containment strategy to respondents (items 28; mean = 2.59)

In the same vein items 29, 30, 31, 32 and 33 (mean 2.94, 3.56, 2.65, 4.00 and 4.00 respectively) indicates that NIGEP contain all the cases of guinea worm disease in Ebonyi State. NIGEP detect and treat all cases of GWD to prevent further transmission. Grand mean of 3.05 shows that NIGEP contains the cases of guinea worm disease in Ebonyi state to a great extent.

Table 6. Mean responses on extent to which NIGEP conducted surveillance on guinea worm disease in Ebonyi State. N = 388

S/N	Item	$\overline{X}$	SD	Decision
34.	NIGEP locates the various sources of drinking water in Ebonyi State	3.65	0.63	GE
35.	NIGEP conducts case search in Ebonyi State	3.65	0.63	VGE
36.	NIGEP assesses drinking water sources in Ebonyi State	3.68	0.67	VGE
37.	NIGEP ensures that the people in Ebonyi State comply to surveillance	3.65	0.64	VGE
38.	NIGEP use traditional leaders to put surveillance into motion by fining anybody that hides cases of guinea worm	3.12	1.07	GE
39.	Cash rewards are given to those who report case of guinea worm	4.00	0.00	VGE
40.	NIGEP encourages the village volunteers to promote surveillance in Ebonyi State	2.81	1.12	GE
	Grand Mean	3.51	400	VGE

Table 6 shows that high mean scores of 3.65, 3.65, 3.68, 3.65, 3.12, 4.00 and 2.81 were obtained for items 34-40 respectively. The grand mean of 3.51 was obtained for the cluster indicating that NIGEP conducted surveillance as one of the measures for guinea worm eradication in Ebonyi State to a very great extent.

Table 7. T-test significant difference between the mean responses of urban and rural respondents on the extent to which NIGEP provided safe drinking water to people in Ebonyi State

Group	N	X	SD	DF	SE	t-Cal	t-Crit	Decision
Urban	111	3.572	0.638	386	0.004	2.788	1.960	Rejected
Female	277	2.957	0.754					

Table 7 shows that there is significant difference in the mean responses of urban and rural on the extent to which NIGEP provided safe drinking water to people in Ebonyi State. This could be seen from the fact that the calculated t-value (0.788) is greater than t-critical value (1.960) at.05 level of significance and at 386 degree of freedom hence the null hypothesis was rejected.

DISCUSSION OF FINDINGS

Findings in table 1 indicated that NIGEP carry out health education on eradication of guinea worms in Ebonyi State. This is affirmation of the assertion of Nweke (2000) that health education is the bedrock, most accessible and efficient strategy for the eradication of dracunculiasis. This is based on the fact that it changes the attitudes, beliefs, behavior and then creates awareness about the cause, life cycle and transmission of guinea worm. Thus a well planned health education is an essential component of any effort to eradicate dracunculiasis (Gubb, 2007). Therefore, a well organized, and implemented health education will go a long way to make people change their negative life style, such as scooping water directly from the pond for drinking; notwithstanding their old belief and out look. This is encouraging, moreso as health education is cheap, effective, affordable and accessible strategy in controlling some endemic and pandemic diseases.

Table 2 shows that the respondents agreed that NIGEP provided safe drinking water in the state. This finding may be a confirmation of earlier assertion of Wolfe (2007) that, Carter Center provided financial and technical assistance to national guinea worm eradication programme and that it includes ministries; to empower communities to provide clean drinking water. With this finding, it is reasonable to agree with Gubb (2007) that guinea worm eradication programme has helped to improve the quality of water sources for communities that previously lacked access to clean and safe water. Specifically, NIGEP's supply of pipe borne water to in Ebonyi State was low. This result further affirms the ascertion of Nweke (2004) that piped water is not feasible for most of the GWE areas in Nigeria. This means that the people still source their water from streams, wells and ponds. Furthermore, support the tested hypothesis revealed a difference in the provision of water by NIGEP between the rural and urban location. This finding necessarily an earlier assertion of Nwosu (1998) that the major sources of water supply for rural communities are surface water, example streams, ponds among others; which are highly polluted. This finding has a far reaching implication which could be described as counter productive, recognizing the fact that guinea worm disease has been affirmed by Hopkins & Hopkins (1992) as the only disease that can be eliminated by the provision of safe drinking water alone.

The finding that NIGEP made water filters available to people in Ebonyi State (Table 3) is heart-warming and supports the earlier reports of Nweke (2006), that virtually all endemic villages have been provided with filter in Nigeria. This would encourage households to filter water every time it is collected from the pond. The importance of filtering water has been stressed by Carter (2007), who noted that educating the Villagers to filter Cyclops from their drinking water using fine-mesh filter would breaks the cycle of guinea worm. Eligible ponds in Ebonyi State were treated with abate

chemical by NIGEP (Table 4). This finding alligns with the ascertion of Carter (2007) that dracunculasis can be eradicated through vector control and that this is achieved by interrupting the life cycle of the disease through breaking of the transmission as well as the continuity of the disease. Understandably, treatment of pond water with chemical e.g water guard cannot only interrupt the life cycle of water borne disease e.g. guinea worm, but also kill the organism and make the water safe for drinking.

Table 5 revealed that NIGEP detect and treat all cases of guinea worm in Ebonyi State. This affirms the report of Nweke (2000) that in Nigeria case containment strategy is carried out in all endemic areas leading to high reduction of cases. This measure is also complimented by the fact that when infected people are identified at a pond, the caretakers assist them with water gathering thereby preventing their further contamination of water (Wolfe, 2007). Other moves include giving incentive to patients which gingers them to avail themselves for treatment. This, as noted by Wolfe (2007) include cash rewards offered to the infected villagers who agree to be quarantined while the worm is emerging. Above all, such persons receive free care and food during the period.

The study also revealed that NIGEP conduct case search (surveillance) in Ebonyi State (table 6).This finding supports the report of Staub (2007) who wrote that water sources are monitored and that level of coverage by control measures is reported monthly. Above all, this measure has been facilitated by the Carter Centre through provision of financial support as well as initiate village-based surveillance (Wolfe, 2007). Furthermore, cash rewards are given to those who report case of guinea worm. This is commendable because it helps to reduce stigmatization through the giving of cash reward, involving traditional rulers, thereby facilitating patients to easily and freely avail themselves and assess available treatments, and thereby ensure adequate control of the disease.

 The tested hypothesis (table 7) revealed that significant difference exists in the mean scores of urban and rural respondents on the extent to which NIGEP provided safe drinking water to the people in Ebonyi State. This finding is further validation of finding in table 2. Moreover, pipe born water were found only in Abakiliki (the state capital and which for the purposes of this study was designated as urban location), even though some of the taps were found dried without waters. The finding supports the finding of Nwosu (1982) and Nweke (2006) which recorded that the disease affects people living in rural or remote areas. This finding can be explained from the fact that our rural areas generally lack safe water source. No wonder guinea worm disease affects people more in the rural than urban areas, where relatively, there is safe drinking water through pipe borne water and even private individuals' boreholes.

IMPLICATION OF THE FINDINGS

The findings of this study have far reaching implications: The fact that NIGEP has been reported to have adequately utilized health education of the masses, provision of safe drinking water, supply of filters, treatment of eligible ponds with abate chemical, case containment strategy and surveillance to combat guinea worm disease; is evidence of the organization's move towards the achievements of the objective for which it is set up. Hence, the programme can be described as partnering with the United Nations in it's achievement of the Millennium Development Goals. Specifically, NIGEP's activities have helped to improve the quality of water sources for communities that previously lacked access to clean and safe water, thereby reducing the occurrence of some water borne diseases including guinea worm disease. This invariably would bring about a reduction of farm work and school absenteeism as few or no person would become infected. This development would manifest in a healthy population with improved literacy level; improvement of the farmers; thereby influencing improvement in agricultural productivity status of the area; resulting to decrease in hunger and poverty.

CONCLUSION AND RECOMMENDATIONS

An evaluation of NIGEP eradication programme in Ebonyi State has revealed the extent to which it has achieved its objectives so far. However, it is not yet 'UHURU' as the disease can be imported from other states and other countries. Consequently, it is recommended that;

1. Case containment strategy should be emphasized in the programme of guinea worm eradication of NIGEP officials and government.

2. NIGEP should intensify intensifies active surveillance throughout the state to guard against importation of guinea worm disease until the entire endemic countries are certified free from the disease.

3. Ebonyi State Ministry of Health should support NIGEP activities in enlightenment campaign on guinea worm eradication, among other health issues through the mass media in both urban and rural areas. This serves as a constant reminder of the measures of prevention of guinea worm disease.

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