



Knowledge, Attitude and Practice of People towards Onchocerciasis among Local People Living in Tafa Local Government Area of Niger State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author JLI designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors TA and MAK managed the analyses of the study. Authors MID, TT and UBM managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The study is aimed at assessing the knowledge, attitude and practice of people in Ija-Gwari and Kofa in Niger State towards onchocerciasis, structured questionnaires were administered to 300 respondents comprising 150 from each of the village, which is about 5% of the total population size of the two villages. The sampling technique used to administer the questionnaire was systemic sampling method. In Kofa and Ija-Gwari village, a high proportion 74 (49.3%) and 80 (53.3%) respectively thought it was both a blood and an eye infection while few of the respondents 8 (5.3%) and 2 (1.45%) respectively claimed to have no idea of river blindness. In Kofa village, out of 150 respondents, 146 (97.3%) said they accepted taking the drug and 4 (2.7%) did not accept taking the drug. In Ija-Gwari village out of 150 respondents, 144 (95.9%) said they accepted taking the

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drug and 6 (4.1%) did not accept taking the drug. In Kofa village, out of the 150 respondents, 148 (98.7%) use ivermectin as the type of treatment, while In Ija-Gwari village, out of the 150 respondents 149 (99.3%) use ivermectin as the type of treatment. Since lack of knowledge perpetuates disease, appropriate health education strategy will be necessary to improve the situation.

Keywords: Attitude; knowledge; onchocerciasis; practice.

1. INTRODUCTION

Onchocerciasis is a tissue parasitic disease caused by the filarial worm of *Onchocerca vulvulus* and is transmitted from one individual to another through repeated bites of black fly of the genus *Simulium* during blood meal on human being [1]. The disease is called “river blindness” because the blackfly that transmits the infection lives and breeds near fast-flowing streams and rivers and the infection can result in blindness. Onchocerciasis causes skin diseases including subcutaneous nodules under the skin, debilitating itching and depigmentation of skin. Human onchocerciasis is a severely debilitating disease of major public health importance in many riverine communities of Africa where the black fly vector of the disease abundantly thrives [2,3]. It is estimated that onchocerciasis is the second leading infectious cause of blindness in the world only presided by trachoma [4,5]. Onchocerciasis is also a major cause of 60% of blindness in different parts of Africa where it affects the socio-economic development of people [6,7]. The disease is basically a rural disease affecting communities sited along fast-flowing rivers with symptoms particularly irritating and disabling, often associated with long-term exposure to infection and this affects the social and economic activities of the inhabitants concerned [8]. Onchocerciasis is endemic in 36 countries in Africa, the Arabian peninsula and the Americas, but its distribution is highly concentrated in the poorest regions of the world. About 30 out of 36 endemic countries are in Sub-Saharan African countries where approximately 99% of all those infected live [9]. Onchocerciasis is most common in Africa and Nigeria probably has the highest burden of the disease [10].

Ignorance of the cause and mode of transmission of onchocerciasis has hampered the control of the disease in endemic communities. Various authors have reported the lack of knowledge about the vector parasite afflictions [11,12,13,14], which affects the attitude towards the disease and its control effort. Since lack of knowledge perpetuates disease,

appropriate health education strategy will be necessary to improve the situation. This could be achieved through the primary health system to encourage participation and acceptance of control programs aimed at improving the health status of affected communities. Ignorance and incorrect beliefs can lead to negligence in prevention and control measures and in seeking appropriate treatment. Involvement of individuals and communities is an important component in onchocerciasis control activities. To attain community participation and design socially acceptable control strategies, researchers must be familiar with people’s knowledge, beliefs and behaviour in relation to Onchocerciasis [15].

The presence of a dam in Ija-Gwari and Kofa villages in Tafa local government Area of Niger State constitute a breeding site for blackflies which is the vector of onchocerciasis. The bite of this fly creates a nuisance to the entire communities (personal contact with a resident) making it important to carry out this study in this particular location. Apart from the fear of reoccurrence, the biting nuisance of the *Simulium* flies also imposes colossal socio-economic burden on the affected communities [16]. It is also one of the priority diseases of the VISION 2020 initiative for eliminating avoidable blindness [17]. This present study evaluate the knowledge, attitude and practice of two communities in Tafa local government of Niger state, Nigeria on onchocerciasis. It will also provide useful baseline for appropriate intervention and public health policy in Tafa Local Government area of Niger state Nigeria and possibly in the world at large where applicable. This paper examine the knowledge, attitude and practice of onchocerciasis among people living in rural communities of Tafa local government area of Niger State, Nigeria.

2. MATERIALS AND METHODS

2.1 Study Area

The study was carried out in Ija-Gwari and Kofa villages in Tafa local government area of Niger

state, Nigeria. This local government area shares border with the Federal Capital Territory, Abuja. Tafa lies between Latitude 9°15'N and Longitude 7°15' E. It is part of the onchocerciasis mesoendemic regions in Nigeria. Residents of Tafa local government area are majorly rural dwellers that engage in hunting, farming, and fishing activities. Only very few are civil servants. Major tribes are Gwari, Hausa and Kor [18].

2.2 Study Design

The study is a cross sectional descriptive survey method. Questionnaires were distributed to Ija-Gwari and Kofa residents of Tafa local government area of Niger state to collect data that will be useful to evaluate the knowledge, attitude and practice of the residents. The design was considered appropriate because the general purpose of the survey is to review the current condition of the knowledge, attitude and practice of the residents towards onchocerciasis.

2.3 Sample Size and Sampling Procedure

A sample size of 300 people was used for this study. This was obtained from 5% of the total population size of the two villages (Ija-Gwari and Kofa). There are 616 and 220 houses in Ija-gwari and Kofa villages respectively making it a total of 836 houses (source from health workers). Data on knowledge of the local name, cause, mode of transmission, manifestation, severity, treatment, and prevention of onchocerciasis was collected and analyzed. A total of 300 respondents (aged above 15 years) were selected, one from each household, for the present study. The questionnaire was distributed to 150 respondents in each village. The sampling technique used to administer the questionnaire was systemic sampling method (One (1) person was selected from every other house).

2.4 Data Collection

The data collection was based on questionnaires which were administered by face to face interview to the respondents. The questionnaire was prepared in English Language and translated into Hausa Language (native local language) this will help to get the exact meaning of the translations. In this study, individuals who have not heard about onchocerciasis were excluded on the assumption that responses from this group will not give information that is relevant to this study.

2.5 Questionnaire Design

A structured questionnaire was designed using close ended options. The questionnaire consists of 31 questions which were categorised into four sections. Section A consists of demographic information including age, sex, occupation, religion and educational status of the respondents. In section B, there were ten questions on knowledge of the respondents on onchocerciasis for example what is river blindness, what predisposes to river blindness, impact of Onchocerciasis e.t.c. In section C, there were eleven questions on attitude of respondents towards onchocerciasis, for example if they accept taking ivermectin drugs, where is the best place to get the drugs, will they follow a longer path in order to avoid fly bite, and role of individual in preventing this disease. In section D, there were 10 questions on the practice of respondents towards onchocerciasis, for example; what they use to treat the disease, reason for choosing the option to treat the disease, if they have taken ivermectin before, if they have any reaction, if they wear clothes that protect from fly bite, how often do they take the medication, which activities they engage in, if they applied any topical preparation to prevent fly bite.

2.6 Data Analysis

The data collected at the end of the study was analysed using the Statistical Package for Social Sciences version 20. Each of the questionnaire was marked and the maximum obtainable scores were 10 each for knowledge and practice and 11 for attitude. Scores from 0-5 was regarded as unacceptable while scores above 6 was regarded as acceptable. This was used to measure the knowledge, attitude and practice of the respondents.

3. RESULTS

3.1 Knowledge Regarding Onchocerciasis among Residents of Kofa and Ija-gwari

In Kofa and Ija-Gwari village, a high proportion (74 (49.3%) and 80 (53.3%)) respectively thought it was both a blood and an eye infection while a few of the respondents (8 (5.3%) and 2 (1.45%)) respectively claimed to have no idea. In Kofa and Ija-Gwari villages, a high proportion [123 (82.0%) and 132 (88%) respectively thought blackfly

predisposes to river blindness, while a few people thought it was a curse from the gods [1(0.7%) and 1(0.7%).

In Kofa and Ija-Gwari villages, a high proportion of the respondents (58 (38.7%) and 63 (42.0%)) thought symptoms associated with river blindness was skin rash while few of the respondents in the two villages [2(1.4%) and 3 (2.0%)] respectively thought diarrhoea was a symptom.

In Kofa and Ija-Gwari villages [119 (79.3%) and 137 (91.3%)] respondents respectively thought river blindness could be transmitted by bite of blackfly, while [8(5.3%) and 1(0.7%)] claimed they do not know how river blindness can be transmitted.

In Kofa and Ija-Gwari villages, most of the respondents i.e [89 (59.3%) and 92 (61.3%)] respectively thought onchocerciasis can be prevented by taking ivermectin while a few of the respondents (11 (7.4%) and 6 (4.1%)) respectively thought onchocerciasis can be prevented by maintaining personal hygiene.

In this study, based on their age group it showed that in Kofa village respondents within the age group 56 years and above had the highest acceptable knowledge scores 35 (100%), while In Ija-Gwari village respondents within the age group 26-35 years had highest acceptable knowledge scores 35(100%).

In Kofa village and Ija –Gwari villages based on their sex, males had higher knowledge scores [89 (94.2%) and 85 (97.7%)] respectively (Table 1).

3.2 Attitude Regarding Onchocerciasis among Residents of Kofa and Ija-gwari

In Kofa village, out of 150 respondents, 146 (97.3%) said they took the drug ivermectin and 4 (2.7%) did not take the drug ivermectin. In Ija-Gwari village, out of 150 respondents, 144 (95.9%) said they took the drug ivermectin and 6 (4.1%) did not take the drug ivermectin. In Kofa village out of the 150 respondents, 149 (99.3%) said the drug ivermectin was effective in preventing onchocerciasis while one (0.7%) said the drug ivermectin was not effective in preventing Onchocerciasis. In Ija-Gwari village, all 150 (100.0%) respondents thought the drug ivermectin was effective in preventing

onchocerciasis. In Kofa and Ija-villages all respondents [150 (100%) and 150 (100%)] respectively said the benefit of the drug ivermectin was to prevent blindness, skin disease and to help individuals live a normal life. In Kofa and Ija-Gwari villages all respondents [150 (100%), 150(100%)] respectively said blackfly was a nuisance. In both villages, majority of the respondents [(98.6%) and (97.3%)] in kofa and Ija Gwari respectively were willing to take a longer path to avoid blackfly bite. In Kofa village out of the 150 respondents, 6 (4.0%) have abandoned their farm land because of blackfly bite, while in Ija-Gwari village out of the 150 respondents, 10 (6.7%) have abandoned their farm land because of blackfly bite. In Kofa village out of the 150 respondents, 43 (27.0%) thought destroying breeding sites of blackflies was part of the roles of individuals in preventing the disease. In Ija-Gwari village out of the 150 respondents, 61 (40.7%) thought destroying breeding sites of blackflies was part of the roles of individuals in preventing the disease. The result showed that among respondents from Kofa village, those aged 46-55years had the highest attitude scores 36(100%). In Ija-Gwari village, however respondents within the age group of 26-35 years had the highest acceptable attitude scores 35 (100%).

In Kofa and Ija – Gwari villages, males had the highest attitude scores [86 (100%) and 86 (98.8%)] respectively. In Kofa and Ija –Gwari villages farmers had the highest attitude scores 40 (95.2%) and 52 (100%) respectively.

In Kofa and Ija –Gwari villages, respondents with no formal education had the highest attitude scores 54 (100%) and 55 (98.2%) respectively (Table 2).

3.3 Practice Regarding Onchocerciasis among Residents of Kofa and Ija-gwari

In Kofa village, out of the 150 respondents, 148 (98.7%) use ivermectin drug, while In Ija-Gwari village, out of the 150 respondents 149 (99.3%) use ivermectin drug to prevent river blindness. In Kofa village out of the 150 respondents, only one person (0.7%) has never taken the drug before, while in Ija-Gwari village out of the 150 respondents 8 (5.3%) have never taken the drug before. In Kofa village out of the 150 respondents, 25 (16.7%) claimed they had adverse reactions to the drug ivermectin while In Ija-Gwari village out of the 150 respondents 15 (10.0%) had reactions from the drug ivermectin.

In Kofa village out of the 25 respondents that had adverse reactions 4 (16.0%) had stomach pain.while In Ija-Gwari village out of the 15 respondents that had adverse reactions 2/15(13.3%) had stomach pain. In Kofa village out of the 150 respondents, 133 (88.7%) wear clothings that prevent fly bite, while In Ija-Gwari out of the 150 respondents 130 (86.7%) wear clothings that prevent fly bite. In Kofa and Ija-Gwari villages, 146 (97.3%) and 148 (98.7%) of the respondents respectively take the ivermectin drug yearly.

The result showed that in Kofa village, respondents aged between 46-55 years had the highest practice scores 36(100%),while in Ija-Gwari village, respondents within the ages 26-35 had highest acceptable practice scores 35 (100%). In Kofa village and Ija –Gwari villages, males had higher practice scores of 86 (100%)

and 86 (98.8%) respectively. In Kofa and Ija –Gwari villages, farmers where 42 and 52 in number respectively and they had the highest practice scores of 42 (100%) and 52 (100%) respectively amongst other occupations. In Kofa and Ija –Gwari village respondents with no formal education had the highest practice scores 54 (100%) and 55 (98.2%) respectively (Table 3).

4. DISCUSSION

From the study, there were different responses as regards the knowledge of the respondents in both Kofa and Ija-Gwari villages, a high proportion [74 (49.3%) and 80 (53.3%) respectively] knew that river blindness was both a skin and eye infection. In Kofa and Ija-Gwari villages, majority of the respondents [102 (68.0%) and 115 (76.7%) respectively heard about onchocerciasis from health workers which

Table 1. Summary of demographic variables with categorized knowledge scores of respondents on onchocerciasis in Ija-Gwari and Kofa villages

Scores	Ija-Gwari			Kofa		
	Not acceptable (0-5)	Acceptable (>6)	Total	Not acceptable (0 – 5)	Acceptable (>6)	Total
Age of respondents						
15-25	2 (6.5%)	29 (93.5%)	31	7 (33.3%)	14 (66.7%)	21
26-35	0 (0%)	35 (100%)	35	0 (0%)	26 (100%)	26
36-45	0 (0%)	30 (100%)	30	0 (0%)	32 (100%)	32
46-55	0 (0%)	27 (100%)	27	3 (8.3%)	33 (91.7%)	36
56 and above	1 (3.7%)	26 (96.3%)	27	0 (0%)	35 (100%)	35
Total	3 (2.0%)	147 (98%)	150	10 (6.7%)	140(93.3%)	150
Sex						
Male	2 (2.3%)	85 (97.7%)	87	5 (5.8%)	89 (94.2%)	64
Female	1 (1.6%)	62 (95.3%)	65	5 (7.8%)	51 (92.2%)	150
Total	3 (2.0%)	147 (98%)	150	10 (6.7%)	140 (93.3%)	
Occupation						
Trader	0 (0%)	27 (100%)	27	5 (14.7%)	29 (85.3%)	34
Fisherman	2 (8.3%)	22 (91%)	24	1 (3.1%)	31 (96.9%)	32
Farmer	0 (0%)	52 (100%)	52	2 (4.8%)	40 (95.2%)	42
Civil servant	0 (0%)	12(100%)	12	0 (0%)	14(100%)	14
Hunter	0 (0%)	9 (100%)	9	0 (0%)	7 (100%)	7
Other	1(3.8%)	25 (96.2%)	26	2 (9.5%)	19 (90.5%)	21
Total	3 (2.0%)	147 (98%)	150	10 (6.7%)	140 (93.3%)	150
Educational status of respondents						
No formal education	1 (1.8%)	55 (98.2%)	56	2 (3.7%)	52 (96.3%)	54
Primary education	1 (2.1%)	46 (97.9%)	47	6(12.8%)	41 (87.2%)	47
Secondary education	1 (3.1%)	31 (96.9%)	32	2 (5.3%)	36 (94.7%)	38
Post sec. education	0 (0%)	15 (100%)	15	0 (0%)	11 (100%)	11
Total	3 (2.0%)	147 (98%)	150	10 (6.7%)	140 (93.3%)	150

Table 2. Summary of demographic variables with categorized attitude scores of respondents on Onchocerciasis in Ija-Gwari and Kofa

Scores	Ija Gwari			Kofa		
	Not acceptable (0-5)	Acceptable (>6)	Total	Not acceptable (0 – 5)	Acceptable (>6)	Total
Age of respondents						
15-25	0 (0.0%)	31 (100.0%)	31	1 (4.8%)	20 (95.2)	21
26-35	0 (0.0%)	35 (100.0%)	35	0 (0.0%)	26 (100%)	26
36-45	0 (0.0%)	30 (100.0%)	30	0 (0.0%)	32 (100%)	32
46-55	0 (0.0%)	27 (100.0%)	27	0 (0.0%)	36 (100%)	36
56 and above	1 (0.3%)	26 (96.3%)	27	0 (0.0%)	35 (100%)	35
Total	1 (0.7%)	149 (100%)	150	1 (0.7%)	149(99.3%)	150
Sex						
Male	1 (1.1%)	86 (98.8%)	87	0 (0.0%)	86 (100%)	86
Female	0 (0.0%)	63 (100%)	63	1 (1.6%)	63 (98.4%)	64
Total	1 (0.7%)	149(99.3%)	150	1 (0.7%)	149(99.3%)	150
Occupation						
Trader	0 (0.0%)	27 (100%)	27	1 (2.9%)	33 (97.1%)	34
Fisherman	1 (4.2%)	23 (95.8%)	24	0 (0.0%)	32 (100%)	32
Farmer	0 (0.0%)	52 (100%)	52	0 (0.0%)	42 (100%)	42
Civil servant	0 (0.0%)	12 (100%)	12	0 (0.0%)	14 (100%)	14
Hunter	0 (0.0%)	9 (100%)	9	0 (0.0%)	7 (100%)	7
Other	0 (0.0%)	26 (100%)	26	0 (0.0%)	21 (100%)	21
Total	1 (0.7%)	149 (100%)	150	1 (0.7%)	149(99.3%)	150
Educational status of respondents						
No formal education	1 (1.8%)	55 (98.2%)	56	0 (0.0%)	54 (100%)	54
Primary education	0 (0.0%)	47 (100%)	47	1 (2.1%)	46 (97.9%)	47
Secondary	0 (0.0%)	32 (100%)	32	0 (0.0%)	38 (100%)	38
Post secondary	0 (0.0%)	15 (100%)	15	0 (0.0%)	11 (100%)	11
Total	1 (0.7%)	149 (100%)	150	1 (0.7%)	149(99.3%)	150

is probably because health workers were effective in communicating to the villagers about the disease. In Kofa and Ija-Gwari villages, most of the respondents [123 (82%) and 132 (88.0%) respectively said blackfly predisposes to river blindness. In Kofa and Ija-Gwari villages, respondents mentioned nodule under the skin, skin rash, eye disease as symptoms associated with river blindness. In Kofa and Ija-Gwari villages, respondents 143 (95.3%) and 141 (94.0%) respectively said river blindness is preventable. The results obtained from 300 volunteers in this study showed that the people of Ija-Gwari and Kofa village had adequate knowledge about onchocerciasis. These adequate knowledge could be as a result of the effort made by the health workers to educate the villagers through town hall meetings and occasionally through house to house enlightenment.

In this study it was seen that in Kofa village the older age groups (56 and above years) had more

knowledge 35 (100%) about the black flies and the dangers associated with the black flies if they fail to comply to taking the drug ivermectin. This is probably because of the experiences they had with the disease over time, compared with the younger age groups (15-25 years). On the other hand, in Ija-Gwari village, respondents within the age group 26-35 years had a higher knowledge about onchocerciasis this is probably because they are exposed to current issues from school and other sources of education. Also in Kofa and Ija –Gwari villages farmers had the highest acceptable score on knowledge this is likely because they have been exposed to the bite of these flies during the period of their farming and have sought to know about them. However, few of the respondents in Kofa and Ija-Gwari villages had some misconceptions like curse from the gods, poor nutrition, poor hygiene and consumption of impure water as things that predisposes to river blindness. This is probably because some individuals think some sickness are curses from the gods or probably because of

the food they eat and the type of hygiene they practice.

Many authorities believe that the knowledge, attitude and practice (KAP) of the peasants of rural Africa predispose them to infection [19]. In a similar study to determine the knowledge, attitude and perception of onchocerciasis among subjects in an endemic area of Guatemala, they found that 39% of the residents knew that the disease was caused by a worm and 5% of the people knew that the condition was acquired through the bite of an insect [20]. Also, Research in Jos, Plateau State, Nigeria, reported that though villagers in endemic areas knew of the nuisance of blackfly bites, the majority of them lacked aetiological knowledge of onchocercal lesion [21]. In this study in Kofa and Ija-Gwari village it was found that majority of respondents 119 (79.3%) and 137 (91.3%) respectively knew that onchocerciasis was transmitted through the bites of backflies. Also steps were taken by the residents to prevent or reduce man-vector

contact. In Kofa and Ija-Gwari villages, 146 (97.35) and 144 (96.0%) of the respondents respectively take the drug ivermectin, this is probably because the drug is free and has proved to be effective in curing and preventing river blindness. eive the drug. All this shows good attitude towards river blindness.

There were different response as regards the respondent’s practice towards onchocerciasis. In Kofa and Ija-Gwari villages, 145 (96.7%) and 148 (98.7%) of the respondents respectively took the drug annually. This is probably because this is the recommended time for taking the drugs. Ivermectin when taken annually has the ability to bring about sustained reduction in skin and eye microfilariae to very low levels with reduction in morbidity [22,23] and transmission [24]. In Kofa and Ija-Gwari villages, based on their occupation farmers had the highest acceptable practice score 42 (100%) and 52 (100%) respectively this is probably as a result of the experiences of the bites of the flies they had while working on their

Table 3. Summary of demographic variables with categorized practice scores of respondents on Onchocerciasis in Ija-Gwari and Kofa

Scores	Ijagwari			Kofa		
	Not acceptable (0-5)	Acceptable (>6)	Total	Not acceptable (0-5)	Acceptable (>6)	Total
Age of respondents						
15-25	0 (0.0%)	31 (100%)	31	1 (4.8%)	20 (95.2%)	21
26-35	0 (0.0%)	35 (100%)	35	0 (0.0%)	26 (100%)	26
36-45	0 (0.0%)	30 (100%)	30	0 (0.0%)	32 (100%)	32
46-55	0 (0.0%)	27 (100%)	27	0(0.0%)	36 (100%)	36
56 and above	1 (0.7%)	26 (100%)	27	0 (0.0%)	35 (100%)	35
Total	1 (0.7%)	149(100%)	150	1 (0.7%)	149(99.3%)	150
Sex						
Male	1 (1.1%)	86 (98.9%)	87	0 (0.0%)	86 (100%)	86
Female	0 (0.0%)	63 (100%)	63	1 (1.6%)	63 (98.4%)	64
Total	1 (0.7%)	149(100%)	150	1 (0.7%)	149(99.3%)	150
Occupation						
Trader	0 (0.0%)	27 (100%)	27	1 (2.9%)	33 (97.1%)	34
Fisherman	1 (4.2%)	23 (95.8%)	24	0 (0.0%)	32 (100%)	32
Farmer	0 (0.0%)	52 (100%)	52	0 (0.0%)	42 (100%)	42
Civil servant	0 (0.0%)	12 (100%)	12	0 (0.0%)	14 (100%)	14
Hunter	0 (0.0%)	9 (100%)	9	0 (0.0%)	7 (100%)	7
Other	0 (0.0%)	26 (100%)	26	0 (0.0%)	21 (100%)	21
Total	1 (0.7%)	149(100%)	150	1 (0.7%)	149(99.3%)	150
Educational status of respondents						
No formal education	1 (1.8%)	55 (98.2%)	56	0 (0.0%)	54 (100%)	54
Primary education	0 (0.0%)	47 (100%)	47	1 (2.1%)	46 (100%)	47
Secondary	0 (0.0%)	32 (100%)	32	0 (0.0%)	38 (100%)	38
Post secondary	0 (0.0%)	15 (100%)	15	0 (0.0%)	11 (100%)	11
Total	1 (0.7%)	149(99.3%)	150	1 (0.7%)	149(99.3%)	150

farmers which have made them to sought to know about the flies. All these showed clearly very good knowledge, attitude and practice towards the diseases in the two villages. Various authors have reported the lack of knowledge about the vector parasite afflictions [11,12,13], which affects the attitude towards the disease and its control effort.

According to Molyneux [25], 65-80% coverage is necessary for significant and persistent regression in morbidity. In this study because ivermectin distribution coverage was high (90% and above), in Kofa and Ija-Gwari villages, ivermectin acceptance was (97.3%) and (95.9%) respectively. Majority of the respondents took the drug, none of the individuals constitute a reservoir for infection and reinfection in the community.

5. CONCLUSION

Adequate knowledge of *Onchocerca volvulus*, its mode of transmission; disease manifestation; and the efficacy of ivermectin treatment has brought about the desired positive change of attitude and perception or behaviour that has enhanced individual and community acceptance of ivermectin in Kofa and Ija-Gwari village. The low educational level of the respondents did not restrict their knowledge of the disease which shows that health workers have been effective in educating the respondents through awareness campaign in the two villages.

CONSENT AND ETHICAL APPROVAL

A letter of introduction was obtained from the Department of Veterinary Public Health and Preventive Medicine, Faculty of Veterinary Medicine Ahmadu Bello University Zaria to the village head of each of the villages. Approval to carry out the study was given by the village heads of each of the villages. Consent was obtained from every eligible respondents before inclusion into the study by explaining the objective of the research.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Lopez VR, Huerga H. Infectious disease from immigrant from the perspective of tropical medicine referral unit. The American Journal of Tropical Medicine and Hygiene. 2003;69(1):155-121.
2. Post RJ, Flock PK, Millet AL, Check RA, Mc Call PJ, Wilson MD, Mustapha M, Somari S, Davies JB, Mark RA, Greenen P, Enyong P, Sima A, Mas J. Cytotaxonomy, morphology and molecular systematics of the Bioko form of *Simulium yahense* (Diptera: Simuliidae). Bulletin of Entomological Resources. 2003;93:145-157.
3. Adeleke MA, Olaoye IK, Ayanwale A.S. Socio-economic implications of *Simulium damnosum* complex infestations in some rural communities in Odeda Local Government Area of Ogun State. Journal of Public Health and Epidemiology. 2010;2(5):109-112.
4. Sommer A. Avoidable blindness. Australian and New Zealand. Journal of Ophthalmology. 1988;16(1):31-35.
5. Thylefors B, Negrel AD, Pararajasegaram R. Epidemiologic aspects of global blindness prevention. Current Opinion in Ophthalmology.1992;3(6):824-834.
6. Abiose A. Operational Research for Ivermectin – Based onchocerciasis control in Nigeria. Nigerian Journal of Ophthalmology. 1993;2:32-37.
7. World Health Organization. Expert Committee on Onchocerciasis Control Onchocerciasis and its Control. Geneva; 1995.
8. Edungbola LD, Asaolu L. Parasitologic survey of onchocerciasis (River Blindness) in Babana district, Kwara state, Nigeria. American Journal of Tropical Medicin and Hygiene.1988;33:1149-1154.
9. Etya'ale DE. Eliminating onchocerciasis as a public health problem: The beginning of the end. British Journal of Ophthalmology. 2002;86(8):844-6.
10. Oyibo WA, Fagbenro-Beyioku AF. Effect of repeated community based Ivermectin treatment on the intensity of onchocerciasis in Nigeria. Rural Remedy Health Journal. 2003;3:211-221.
11. Johnson K, Courtright P, Burnham G. Knowledge and attitudes towards onchocerciasis in the Thyolo highlands of Malawi. Tropical Medical Parasitology. 1994;45(4):341-343.
12. Nwoke BEB, Dozie INS, Mberu BU, Oha O, Ukaga CN. Lymphatic Filariasis and Onchocerciasis in the rain forest of South Eastern Nigeria 2: A study of knowledge attitude and practice of endemic

- communities. The Nigerian society for parasitology, 22nd Annual conference held at Benin city Nigeria. 1998;154-161.
13. World Health Organisation. New light shed on the importance and care of onchocercal skin disease. TDR News No. 55. 1998;99-104.
 14. World Health Organization. Global initiative for the elimination of avoidable blindness. WHO/PBL/97.61.1998;7-11.
 15. Wogu MD, Okaka CE. Prevalence and socioeconomic effect of onchocerciasis in Okpuje. International Journal of Biomedical and Health Sciences. 2008;4(3);77-83.
 16. Ebomoyi EW, Omonisi MK. Human ecology and behaviour in onchocerciasis control in isolated villages of Kwara State, Nigeria. *Ambio*.1991;1:43-47.
 17. Agbolade OM, Akinboye DO, Ogunkolo OF. Loa loa and Mansonella perstans: Neglected human infection that need control in Nigeria. African Journal of Biotechnology. 2005;4(13):66-69.
 18. World Health Organisation. Tropical disease Research progress 1995-96, Thirteenth Progress Report. UNDP/World Bank/WHO/TDR/97; 1997.
 19. Cupp EW, Ochoa JO, Collins MS, Gonzalez-Peralta C. The effects of repetitive community-wide ivermectin treatment on transmission of Onchocerca. 1992;7-11.
 20. Remme JH, Blas E, Chitsulo L. Strategic Emphases for Tropical Diseases Research: A TDR perspective. Trends in Parasitology. 2002;18:421-426.
 21. Adeleke MA, Sam WSO, Mafiana CF. Perception on bioecology of onchocerciasis vectors around Osun River South-western Nigeria. 2011;3(4):162-166.
 22. Traore S, Wilon MD, Barro T. The elimination of onchocerciasis vector from island of Bioko as a result of larviciding by WHO African program for onchocerciasis Control. *Acta tropica*. 2009;111(3):211-218.
 23. Garm R, Lakwo TL, Kipp W. The elimination of vector of onchocerciasis from Uganda by larviciding. *Acta Tropica*. 2009;111(3)203-210.
 24. Awadzi K, Attah SK, Addy ET, Opoku NO, Ahmed K. Thirty month follow up of sub optimal responders to multiple treatment with ivermectin in two onchocerciasis endemic foci in Ghana. *Annals of Tropical Medicine and Parasitology*. 2004;98(4): 359-370.
 25. Molyneux DH. Onchocerciasis control and elimination: Coming of age in resource constrained health systems. *Trends parasitology*. 2005;21:525-529.

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