

**KNOWLEDGE LEVEL AND ATTITUDE OF ARTISANAL FISHERMEN
TOWARDS MALARIA PREVENTION IN FISHING COMMUNITIES IN EKET
AGRICULTURAL ZONE, AKWA IBOM STATE, NIGERIA**

Nkeme, K. K., Nelson Okorie, and Frank, Namso N.

Department of Agricultural Economics and Extension, Akwa Ibom State University, Obio
Akpa Campus, Akwa Ibom State, Nigeria

ABSTRACT

The study assessed artisanal fishermen's knowledge level and attitude towards malaria prevention in the study area. The primary data used were derived from a structured questionnaire. Multi-stage sampling procedures were used to select 120 fishermen. Data analysis included descriptive statistics and logistic regression analysis. Results showed that artisanal fishing was dominated by men of active age, married and literate, with an average household of 5 persons and fishing experience of 13 years. They made an average monthly income of N38,000.00, but the majority had no access to credit. Their relevant treatment methods included consultation of trado-doctors, patent medicine dealers, and the use of herbs. Their attitudinal preventive measures included home treatment, vaccination, and protection of doors and windows with nets. The determinants of knowledge of prevention were membership of cooperative societies, level of education, fishing experience, household size, and income from fishing. However, determinants of attitudinal preventive measures were marital status, membership of cooperative societies, level of education, fishing experience, age of fishermen, household size, and income from fishing. The study recommended educational interventions and encouragement to belong to cooperative societies as requisites to increased knowledge level of fishermen on malaria prevention.

Keywords: Knowledge level, Attitude, Artisanal fishermen, malaria, Fishing Communities.

INTRODUCTION

In emerging economies like Nigeria, rural and coastal dwellers are contingent upon climate-sensitive livelihoods such as fishing, agriculture, and forestry. Most households in the coastal areas are involved in fishery-related occupations (Food and Agriculture Organization (FAO), 2023). Fisheries play an important role in providing food, income, and employment in many developing countries, including Nigeria. This sub-sector's monetary yield offers significant contributions to assuage poverty and food insecurity, especially for the rural people through dietary protein intake of fish; revenue to those on a job, and through the generation of revenues from exports (Nkeme, Frank, and Okon 2020). Be that as it may, these communities lack physical infrastructures and access to other rudimentary amenities of life (Auwalu, 2023; Oyebamiji et al., 2021; Marine Resources Assessment Group (MRAG), 2021). Thus, they are worst affected at slightest disease outbreaks and most endangered by malaria because of the availability of potential breeding grounds.

The impact of malaria on the fisheries sub-sector of agriculture cannot be overemphasized. Fishing societies are at high danger, acting as possible "hotspots" for speedy breeding of the carried species and spread of the parasites due to the availability of stagnant water and, at times, pitiable aseptic practices within them, thus menacing employment, upsetting value chains, global trade, and posing risks to fish supply chains (FAO, 2019). According to Ekong (2024), it is the amalgamation of bio-physical and socio-economic dynamics that characterizes the susceptibility of natural resource-based livelihood systems, and the fishery is one. Its effect has been projected to have significant global consequences on all sectors of the economy, and the most vulnerable is the agricultural sector. This is because the food sequence is a complex web that consists of primary producers and middlemen, down to consumers.

Fishing is a high-risk business because of the fugitive nature of the resource, the intimidating milieu of the seas, perishability of the product (MRAG 2021), and the transitive nature of the fisher-folks. Since malaria lives with us in the tropics and the symptoms are very familiar, there has been a mirage of misperception and misinterpretation of the disease, its modus operandi on infection, and the essential safety measures. Equally challenging is the enormous parody and deception on social media on malaria and the skepticism on the potency of most discovered vaccines and ACT treatment drugs. Moreover, facts on malaria and prescriptions by experts are received with great doubt by them because fishermen see the disease as one that has come to stay.

The fishing populations are exceedingly exposed to mutual health associations, socio-economic and institutional vagaries customarily because of their great reliance on natural means (Das and Binoy, 2026). This makes the fishers most vulnerable. Therefore, empathy for folks' vulnerabilities, enacting achievable policies of mediation (Heck, 2020), and providing choices for amelioration requires a question on their self-evaluation. It should be noted that poor knowledge of any disease condition may lead to poor practice. Therefore, it is crucially important to comprehend their familiarity, responses, loyalty to, and receipt of malaria control procedures that impact their everyday lives. The facts so made, along with all-inclusive assessments and endorsements, will aid malaria mitigation and comparable imminent fears by enlightening the consciousness of the people and engendering positive approaches to check this endemic disease.

According to Utete (2023), in natural resource-dependent societies like fishing, notwithstanding the significance of health, there is a complete paucity of health information disturbing the folks. If ordinary health issues of fishers have questions, the worst case will be that of an endemic condition. Conditions emanating from a malaria endemic situation are bound to compromise agricultural production, nutritional and health statuses of all affected agricultural communities in a country.

This is so because the comb for facts in fishing economies is very arduous, ambiguous, multifaceted, and asymmetrical. This is the fundamental knowledge of the lifecycle in the fishing economy, according to Carnaje (2021). The characteristic of the fishing economy replicates the key challenge of not harmonizing choices but defining their challenges. Therefore, fact exploration is the bedrock of any fishing economy (Carnaje, 2021). This, according to her, is exacerbated by the fact that information in these economies of especially unindustrialized nations is underprivileged, rare, mal-distributed, incompetently connected, but strongly treasured. She opined that there are no ostentatious machineries for data compilation and transmission; neither is there advertising or merchandise regularization. Equally, their level of unawareness in all is very high.

The artisanal fishermen in the Eket agricultural zone of Akwa Ibom State are not exempt. Their economy is not only ignorant but vulnerable and gullible. Therefore, most secular and health information and enlightenment campaigns will exclude them. Poor and mal-distributed information, especially on a disease that is fondly referred to as “common,” will stall its early-stage detection and treatment; and malaria is one of such diseases. There are legions of reports about knowledge, attitudes, and practices relating to malaria and its control in Nigeria and indeed Africa. Udofia, Uyanga, and Ogunkelu (2023) did it in Mkpato Enin; Udonwa, Gyuse, and Etokidem (2022) did it in Calabar; Lopez and Brown (2020) did it in Ogun; Chukwurah, Idowu, Adeneye, Aina, Agomo, and Otubanjo (2016) did it in Lagos; while Shonisani, Mashau, and Munyai (2022) did it in South Africa. Their reports establish fallacies regarding the malaria disease and that its prevention strategies are second-rate (Shonisani, Mashau, and Munyai, 2022). Again, most of this research are straight blanket statement and not sub-sector specific. This makes the present research unique, as it is the vulnerable fishermen who are involved. Thus, progressive knowledge principles, preventive practices with respect to the disease, and the vulnerable sub-sector are required. Examining the vulnerability of fishing populations will help in recognizing and describing judicious arrangements to be made in order to fight the adverse effects of malaria. It will also help in efficacious execution of the numerous robust health policies by creating consciousness, extenuation, and alteration choices. The specific objectives were to: (i) describe the socio-economic characteristics of the artisanal fishermen in the study area; (ii) assess the knowledge level of artisanal fishermen on the prevention of malaria in the study area, (iii) assess the attitude of artisanal fishermen toward the adoption of malaria preventive measures, (iv) estimate determinants of artisanal fishermen’s knowledge on adoption of malaria preventive measures (v) estimate determinants of attitude of artisanal fishermen on adoption of malaria preventive measures.

RESEARCH METHODOLOGY

Study Area: The study was carried out in the Eket agricultural zone of Akwa Ibom State, Nigeria. It is one of the six agricultural zones in Akwa Ibom State. The Eket agricultural zone houses seven (7) Local Government Areas (LGAs). It is located in the coastal part of the state, lying between latitudes 4°32'N and 5°33'N, and longitudes 7°25'E and 8°25'E, with Coordinates 05°00'N 07°50'E. The zone enjoys a tropical humid climate with two climatic seasons- the rainy season and the dry season. The annual precipitation ranges from 2000 - 3000mm per annum. It has an estimated population of well over 260,000 according to an updated 2.50% annual growth rate as of 2019 (National Population Commission (NPC) 2007). The people of the zone are predominantly fishers, farmers, and traders. Fishery activities are the cheapest, easiest source of food, income, and employment opportunities for many artisanal fishers in these coastal rural communities within the zone.

Sampling Technique: The study adopted the multi-stage sampling procedures. The first stage involved the purposive selection of the Eket agricultural zone because this is where intensive fishing is carried out. The second stage involved the purposive selection of three (3) Local Government Areas from where intensive fishing is practiced. The third stage involved the random selection of two fishing communities from each of the selected Local Government Areas, making a total of six (6) fishing communities. The fourth stage involved the random selection of twenty (20) fishermen from each of the already selected fishing communities using a list of fishermen who have registered with fishermen unions in the respective fishing communities. A total of 120 respondents were selected and used for the study.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

According to Table 1, the gender distribution shows that 105 (87.50%) of them were male, while 15 (12.50%) were female. This is a clear indication that fishing activities are mostly practiced by the male gender in coastal areas. Same findings were reported by Frank, Okonkwo, Obot, and Asogwa (2019). They stated that more males were involved in fishing activities than females.

The age result reveals that 41.66% of the respondents were within the age brackets of 31-40 years, 34.16% were within the age brackets of 41-50 years. 17.50% were within the age brackets of 51-60 years, 6.66% were within 21-30 years, while the mean age was 49.51 years, indicating that a good number of adults in their active age were involved in fishing. Similar findings were reported by Frank *et al.*; (2019) and Nkeme (2021). The majority, 79 (65.83%) of them were married, 12 (10%) were single, 11 (9.16%) were divorced, while 12 (18%) were widowers. This agrees with the findings of George *et al.* (2021), who stated that most fishers were married people with the ultimate aim of making ends meet and catering for their children.

As regards educational status, most of the respondents (45.0%) had completed primary education, 25% had completed secondary education, while 6.66% had completed tertiary education. This result is in line with Frank and Umoh (2019), who stated that over 70% of their respondents had formal education. The household size mean value was about 5 persons, and 35% of the respondents had a household size of 1-5 persons, while 65% had 6-10 persons per household. In the study area, 23.33% of respondents had fishing experience between 1-10 years, 60.00% had between 11-20 years of fishing experience, 17.50% had between 21-30

years, while 7.5% had more than 30 years of fishing experience. This is in line with Udofia (2023), and it implies that artisanal fishing activities are dominated by experienced fishermen. The bulk of the fishers 77.50% earned a monthly income of between N30,000 and N40,000 from other occupations, 26.66% earned between N41,000 and N50,000, 5.83% earned more than N50,000, while 15.00% earned below N30,000 annually, respectively. This result is in line with Frank et al. (2019) findings of artisanal fishermen in Akwa Ibom. They reported that most fishers had other money-yielding ventures. In terms of access to credit, the result further revealed that 85.83% had no access to credit, while 14.16% did. This is corroborated by Frank and Umoh (2019), (2015), and Dimelu *et al.* (2020), who asserted that artisanal fishers lack access to credit except through their cooperatives.

Table 1: Distribution of respondents based on socio-economic characteristics

Socio-Economic Variables	Percentage (Frequency)	Mean
Gender		
Male	87.50% (105)	
Female	12.50% (15)	
Total	100% (120)	
Age		
20-30	6.66% (8)	
31-40	41.66% (50)	
41-50	34.16% (41)	
51-60	17.50% (21)	
Total	100% (120)	
Marital Status		
Single	10.00% (12)	2.39
Married	65.83% (79)	
Divorced	9.16% (11)	
Widower	15.00% (18)	
Total	100% (120)	
Educational Status		
No formal education	23.33% (28)	2.17
Primary education	45.00% (54)	
Secondary education	25.00 (30)	
Tertiary education	6.66% (8)	
Total	100% (120)	
Household Size		
5-Jan	35.00% (42)	4.88
10-Jun	65.00% (78)	
Total	100% (120)	
Fishing Experience		
1-10 years	23.33% (28)	13.97
11-20 years	60.00% (72)	
21-30 years	17.50% (21)	
30 years & above	7.50% (9)	
Total	100% (120)	
Income from other sources		
< 30,000	15.00% (18)	
30,000-40,000	77.50% (63)	
41,000-50,000	26.66% (32)	
> 50,000	5.83% (7)	
Total	100% (120)	
Access To Credit		
Yes	14.16% (17)	1.33
No	85.83% (103)	
Total	100% (120)	

Source: Field survey, 2024.

Knowledge Level of Artisanal Fishermen on Malaria Prevention

The malaria knowledge level shows that the respondents know that malaria is a parasitic and bacterial disease. This fallacy in distinction may be because of their familiarity with the word bacteria to mean invisible microbes disease causing agents. However, some of them looked at the disease as a natural phenomenon, but all know that malaria is not a viral disease.

The distribution of artisanal fishermen based on their knowledge of the cause of malaria showed that most of the respondents were aware of what causes malaria - mosquito bites. This may be credited to the majority of the respondents being lettered as can be seen from the socio-economic characteristics. This is in line with Shonisani, Mashau, and Munyai (2022), who recounted that the respondents were knowledgeable of the disease.

On the degree of seriousness of the disease as envisaged by the respondents, they responded that the disease is a very common one, though serious and at times very serious. This might not be unconnected with the fact that the tropic is a malaria-endemic area, which makes it a very common disease; and the seriousness could stem from the lost man-hours when one is down with the disease, or the restlessness associated with it when any household member is down with it. This is corroborated by Chukwurah, Idowu, Adeneye, Agomo, and Otubanjo (2025). They reported that the disease was a common but serious one.

When knowledge on signs of malaria attack was analyzed, the respondents reported that body pain, yellowish eyes, vomiting, and fever were relevant signs of the disease, while headache, loss of appetite, and bitter tongue were very relevant signs of the attack. These signs may, however, be misleading in terms of essential vitamins deficiencies and the indication of other organs' malfunctioning. This is in line with Chukwurah *et. al.* (2025) report. They reported that fever and headache were symptoms of the disease.

Knowledge of prevention of the disease attack shows that the respondents knew about some malaria preventive methods. They agreed that the prevention of the presence of mosquitoes and burning of scented leaves before bedtime were very relevant preventive methods. This is a fallout of their knowledge of malaria taught in school, while that of burning of scent leaves has been the traditional method of preventing the causative agents and has been proven to be potent. Prevention of breeding grounds, checking stagnant water reservoirs, and making use of mosquito nets were other preventive methods relevant to the respondents. This is still a manifestation of their knowledge of the viable breeding ground of the mosquito. However, prevention of the presence of flies, checking contaminated water, spraying rooms with insecticides every night, and taking malaria drugs every month were not relevant preventive methods for the respondents. The last two may be because of the costs involved.

Knowledge on treatments showed that consultation of a traditional medicine man was relevant, consultation of a patent medicine owner, and use of herbs/roots were very relevant methods of treatment to the respondents. This may not be unconnected with the ease and accessibility of the methods, as many of the malaria drugs have developed resistance against some strains of malaria. Consulting a medical doctor and a medical diagnostic analysis were not relevant methods, perhaps because of the costs and time involved.

Table II: Respondents' Responses to Knowledge Questions on Malaria Prevention

SN	Knowledge about Malaria	4	3	2	1	Total	WS	Mean	Infer
Knowledge on the Type of Disease									
	Parasitic disease	6	1	1	20	120	370	3.083	VR
		9	2	9					
	Viral disease	4	1	2	41	120	295	2.458	NR
		0	6	3					
	Natural phenomenon	4	1	3	30	120	316	2.633	R
		6	4	0					
	Bacterial disease	7	1	2	12	120	384	3.200	VR
		0	6	2					
Knowledge on malaria Cause									
	Caused by a mosquito bite	7	1	1	9	120	398	3.316	VR
		4	9	8					
	Caused by contaminated water	2	2	5	22	120	286	2.383	NR
		1	6	1					
	Caused by contaminated air	2	3	2	38	120	285	2.375	NR
		5	3	4					
	Caused by flies	2	3	2	34	110	260	2.363	NR
		2	0	4					
Knowledge on Degree of Seriousness									
	Very serious illness	6	2	3	3	120	387	3.225	VR
		4	2	1					
	Serious illness	6	3	1	10	120	383	3.191	VR
		0	3	7					
	Common illness	5	3	2	11	120	374	3.116	VR
		7	1	1					
Knowledge of malaria Symptoms									
	Body pains	4	3	3	12	120	342	2.850	R
		1	2	5					
	Yellow eyes	4	2	3	23	120	330	2.750	R
		6	1	0					
	Headache	5	2	2	16	120	365	3.041	VR
		7	7	0					
	Lack of appetite	2	3	3	30	120	296	2.466	VR
		7	2	1					
	Fever	6	2	1	23	120	359	2.991	R
		0	2	5					
	Vomiting	4	2	2	27	120	323	2.691	R
		2	6	5					
	Bitter tongue	7	1	1	21	120	378	3.150	VR
		0	9	0					
Knowledge on prevention									
	Prevent the presence of Mosquito	6	2	2	16	122	368	3.016	VR
		0	0	6					

Prevent breeding grounds	4 8	1 9	2 8	25	120	330	2.750	R
Check stagnant water reservoir	4 0	2 6	2 3	31	120	315	2.625	R
Prevent the presence of flies	3 8	1 4	2 1	47	120	283	2.358	NR
Check contaminated water	2 4	2 5	3 2	39	120	274	2.283	NR
Make use of Mosquito nets	4 8	2 0	2 6	26	120	330	2.750	R
Spray the room with insecticides every night	2 7	1 9	3 9	35	120	278	2.316	NR
Take malaria drugs every month	3 0	2 4	2 5	41	120	283	2.358	NR
Burn scent leaves every night before sleep	5 1	4 2	1 0	17	120	367	3.058	VR
Knowledge of Treatment								
Consult the Medical Doctor	2 7	2 4	2 4	35	110	263	2.390	NR
Consult the Trado Doctor	5 7	2 0	2 5	18	120	356	2.966	R
Visit the pharmacist	3 6	2 1	2 4	39	120	294	2.450	NR
Patronize the pattern medicine dealer	6 2	2 1	2 7	10	120	375	3.125	VR
Use the known herbs/roots	5 4	3 2	1 7	7	110	353	3.209	VR
Go for a diagnostic test	2 0	2 5	5 5	20	120	285	2.375	NR

Source: Field Survey data, 2024.

Note: < 2.50 = Not Relevant, 2.51 - 3.00 = Relevant, 3.01 – 3.50 = Very Relevant, 3.51 – 4.0 = Highly Relevant. (NR (1) = Not Relevant, R (2) = Relevant, VR (3) = Very Relevant, HR (4) = Highly Relevant)

Artisanal fishermen's attitude towards Malaria prevention in the study area

The result shows that voluntary subjection of oneself to malaria vaccination for prevention at any time and day, preference of herbs/root treatment to ACT drugs if infected, and preference of mosquito coil to net usage were relevant malaria prevention strategies by the attitudinal judgment of the artisanal fishermen. This is in line with Akintola *et. al.* (2022) report. They reported that most of respondents preferred herbal treatment of the disease. Preference for treatment at home rather than going to health centers, protection of house windows and doors with mosquito nets, and preference for treatment of malaria with tablets rather than injections were very relevant (VR) attitudinal malaria prevention strategies.

Table III: Artisanal Fishermen's Attitudes towards Malaria Prevention in the Study Area

Attitude Questions	1	2	3	4	Total	WS	Mean	Infer
1. Attendance of a seminar on Malaria in and around my neighbourhood?	37	2 7	2 4	3 2	120	291	2.425	NR
2. Adherence to Malaria prevention as displayed on any flyer.	30	3 5	3 9	1 6	120	281	2.341	NR
3. Immediate report of any malaria infected person(s) to health authorities.	31	3 0	3 2	2 7	120	295	2.458	NR
4. Voluntary subjection of oneself to Malaria vaccination for prevention at any time and day.	41	2 8	4 9	4 2	160	412	2.575	R
5. Compulsory subjection of a family member with symptoms to health authorities.	34	2 4	3 8	2 4	120	292	2.433	NR
6. For Malaria infection, I prefer to be treated at home rather than go to the health centre.	21	1 2	1 6	7 1	120	377	3.141	VR
7. I will adhere to lockdown if imposed due to malaria infestation.	36	3 0	3 1	2 3	120	281	2.341	NR
8. The use mosquito net in the family house for night sleep.	41	3 3	2 2	2 4	120	269	2.241	NR
9. I will oblige the prevention of my house windows and doors with nets.	25	1 2	2 5	5 8	120	356	2.966	VR
10. Voluntary and regular disposal of stagnant water containers.	20	1 4	3 2	5 4	120	360	3.00	VR

11. Infected with malaria, I would prefer herbs/root treatment to ACT drugs	22	2	2	5	120	351	2.925	R
		1	1	6				
12. For prevention, I will prefer mosquito coils to net usage.	23	2	4	2				
		9	1	7	120	312	2.6	R
13. For treatment, I will prefer malaria tablets to injections	15	3	2	5				
		1	3	1	120	350	2.916	VR

Note: < 2.50 = Not Relevant, 2.51 - 3.00 = Relevant, 3.01 – 3.50 = Very Relevant, 3.51 – 4.0 = Highly Relevant. (NR (1) = Not Relevant, R (2) = Relevant, VR (3) = Very Relevant, HR (4) = Highly Relevant)

Determinants of artisanal fishermen's knowledge level of malaria prevention.

The estimated logit model for the determinants shows that the log likelihood ratio and log likelihood ratio (232.02) was all significant at 1%, showing that the specified model jointly and adequately explained the variation in knowledge of fishermen in the prevention of malaria. The constant term was significant, showing the goodness of fit of the estimated model. Result showed that the estimated coefficients of membership of cooperative societies, level of education, fishing experience, household size, and income were positive and significant at 1% and 10% level of probability. This denotes that increasing these variables will increase malaria prevention knowledge among fishermen and vice versa. The positive sign for education is expected because educated fishermen are expected to be more knowledgeable in relevant information sources and hence apt to learn and utilize. They can more easily read and understand malaria preventive information printed on flyers and other electronic media than their counterparts. This aligns with the findings of Lee *et al.* (2021) in South Korea. The positive and significant relationship for membership of cooperative society is expected since the majority of fishermen were male. Male fishermen have enough time after each fishing day to sit out and interact with friends and may access malaria-related information more than the women. This finding aligns with those of Lee *et al.* (2021), who reported a positive association between membership of cooperatives and a high level of knowledge in South Korea. The positive sign for fishing experience is also in order because age and experience are associated with knowledge and wisdom. This is possible because they may have, over time, been familiar with diverse health information sources that they can leverage on to access malaria preventive information, hence, are expected to be highly knowledgeable. Equally, the positive coefficient of household members was expected because each person has different ways of reacting to diseases, and the track record of each person's treatment is bound to increase the head of household's experience in disease prevention. The positive coefficient of income from fishing indicates that wealthy fishermen are more likely to access orthodox medical services when sick than their less privileged counterparts.

Table IV: Estimated Logit Model for the Determinants of Fishermen Level of Knowledge

Variable	Coefficient	Standard error	Z-value
Constant	12.53854	0.486886	11.71***
Gender	0.205608	0.251492	1.796
Marital Status	0.548688	2.592030	0.1420
Cooperative Membership	6.206e-08	5.351e-08	3.18***
Level of education	0.059832	0.011753	3.25***
Fishing experience	0.183116	0.136737	1.752*
Age of a fisherman	0.005582	0.004481	0.7523
Household size	4.550e-05	1.222e-05	2.513***
Income of fishermen	0.102906	0.12306	11.043***
Diagnostic tests			
Wald chi ²			= 73.26***
Pseudo R ²			= 0.074
Log likelihood			= 232.02***

Source: Field survey data, 2024.

***,** and * denotes significant at 1%, 5%, and 10% levels, respectively.

Determinants of artisanal fishermen's attitude on malaria prevention

The result of the estimated logit model for the fishermen's socio-economic characteristics on the fishermen's attitude gave a constant ratio estimated Wald chi² of 91.02, and Log likelihood ratio (226.021). They were all significant, showing the goodness of fit of the estimated model. The coefficients for marital status, membership of cooperative society, level of education, fishing experience, age of fishermen, household size, and income from fishing were positive and significantly related to attitude, while gender had a positive relationship but was statistically not significant. The positive status of marital status was expected because marriage was for procreation, and having children in an endemic area like Nigeria is bound to engender attitudinal change in the treatment of malaria. Membership in a cooperative society is social capital because the interaction of members is likely to influence attitudinal changes both in health and secular issues. The positive coefficient for age, membership of cooperative, is expected since age is synonymous with experience, and association is synonymous with influence. Chukwurah *et al.* (2025) reported that age was a key predictor of women's attitude towards condoning self-resilience and adoption of measures for better health in Vietnam. The positive relationship of education is justified because education, as a social capital tool and continuous access to such diverse information, is capable of provoking a change of attitude among this group of fishermen. This is consistent with those of Chukwurah *et al.* (2025). Therefore, an increase in fishing experience is likely to influence attitude, unlike a novice who is coming to the fishing environment for the first time. Household size and income from fishing are as explained in the knowledge situation above.

Table IV: Estimated Logit Model for the Determinants of Fishermen Attitude

Variable	Coefficient	Standard error	Z-value
Constant	10.24858	0.21547	13.457***
Gender	0.472361	0.251492	3.1245
Marital Status	0.687590	4.845236	4.257**
Cooperative Membership	4.012454	2.782410	5.586**
Level of education	0.072598	0.045782	5.783**
Fishing experience	0.245781	0.457882	4.2568*
Age of a fisherman	0.014578	0.102021	8.1245**
Household size	8.012447	3.214547	5.237***
Income of fishermen	0.3147591	0.358792	8.258**
Diagnostic tests			
Wald chi ²			= 91.02***
Pseudo R ²			= 0.081
Log likelihood			= 226.021***

Source: field survey data, 2024.

***,** and * denotes significant at 1%, 5%, and 10% levels, respectively.

CONCLUSION

The research concluded that the bulk of artisanal fishermen had good knowledge that malaria is caused by parasitic bacteria, sustained by mosquito bites, and were of the opinion that it was a serious, varied, but common disease. They also knew the signs to include fever, headache, and loss of appetite with bitter tongues, amongst others. Their knowledge on prevention was checking breeding grounds, checking stagnant water reservoirs, and making use of mosquito nets. Knowledge on treatments hinged on consultation with traditional medicine men, consultation with patent medicine owners, and the use of herbs/roots. Equally, the artisanal fishermen had a positive attitude in terms of preference for treatment at home rather than going to health centers. Obligation for prevention of house windows and doors with mosquito nets and preference for treatment of malaria with tablets rather than injections were very relevant (VR) attitudinal malaria treatment strategies. The study concluded that positive and statistically significant influence on the knowledge level of the fishermen on malaria was exerted by membership of cooperative society, level of education, fishing experience, household size, and income from fishing, while their attitudinal influence was caused by marital status, membership of cooperative society, level of education, fishing experience, age of fishermen, household size, and income from fishing.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made: relevant authorities should intensify relevant scholastic involvement programs from the viewpoint of morals to boost their readiness to take imminent precautionary actions. Sanitary and health inspectors should engage the communities in general sanitation campaigns. These will influence both their knowledge and attitude toward malaria therapeutic management. Again, fishermen should be encouraged to form and be active members of cooperative societies for an increased level of knowledge on malaria.

REFERENCES

- Adeneye, A. K, Jegede, A. S, Mafe, M. A, Nwokocha E. E. (2007): A pilot study to evaluate malaria control strategies in Ogun state, Nigeria. *World Health Population*, 9:83-94.
- Akarika, D. C. (2019). Awareness and knowledge of prostate cancer information among men in Uyo metropolis, Nigeria. *AKSU Journal of Communication Research (AJCR)* 79-91
- Akintola, O. O, Aderounmu, A.F, Abiola, I. O, Olokeogun, O (2022): Quantitative Analysis of Phytochemicals in Barks and Leaves of Okoubaka Aubrevillei Collected From Iwo, Southwestern Nigeria. *Journal of Bioresource Management*. 7(3): 131-142
- Auwalu, F. (2023). Exploring the contemporary challenges of urbanization and the role of sustainable urban development: A study of Lagos City, Nigeria. *Journal of Contemporary Urban Affairs*, 7(1), 175-188. <https://doi.org/10.25034/ijcua.v7n1-12>
- Beaven Utete (2023). Mental health in fishing communities: An overview of current knowledge and information gaps for fisheries. <https://doi.org/10.32388/9F2WMH>
- Carnaje, G. P. (2021). Contractual Arrangement in Philippine Fisheries. Discussion Paper Series. No. 2021-28. <http://www.PIDs.Gov.Ph.of2/06/2026>.
- Chukwurah, Josephine N., Emmanuel T. Idowu, Adeniyi, K. Adeneye, Oluwagbemiga O. Aina, Philip U. Agomo, and Adetoro O. Otubanjo (2025). Knowledge, Attitude and Practice on Malaria Prevention and Sulfadoxine Pyrimethamine Utilisation among Pregnant Women in Badagry, Lagos State, Nigeria. *Malaria Journal*, 11(7).
- Dimelu, M. U., Umoren, A. M., and Chah, J. M. (2020). Determinants of Youth Farmers' Participation in Agricultural Activities in Akwa Ibom State, Nigeria. *Journal of Agricultural Science*, 12(12), 201-212
- Ekong E.U.(2024) Industrialisation of Akwa Ibom State, 38 years on: a critical analysis, *International Journal of Development and Economic Sustainability*. 13(3):85-102.
- Food and Agriculture Organization of the United Nations - FAO. (2023). Nigeria Agriculture at a glance. Retrieved from <https://www.fao.org/nigeria/fao-innigeria/nigeria-at-a-glance/en/> on June 2, 2024.
- Frank, Namso. N. and G. S. Umoh (2015). Participation in Contract Fishing in a Developing Economy: A Qualitative Response Model Analysis. *RJOAS*, 2(38), 20-25.
- Frank, Namso N., and Gabriel S. Umoh (2018). Contractual Arrangements in Artisanal Fishing in the Niger Delta Region of Nigeria. *European Journal of Social Sciences*, 56 (1):5-19.
- Frank, Namso N., Ngozi A. Okonkwo, Oto-Obong Obot, and Uzoamaka. G. Asogwa (2019). Socio-Demographic Characteristics of Contract Artisanal Fishermen in Akwa Ibom State, Nigeria: A Comparative Analysis. *AKSU Journal of Agricultural Economics, Extension and Rural Development*. AKSUJAEERD 2 (1): 90 – 99, 2019
- Heck, N., Agostini, V., Reguero, B., Pflieger, K., Mucke, P., Kirch, L., and Beck, M. W. (2020): Fisheries at Risk – Vulnerability of Fisheries to Climate Change. Technical Report. The Nature Conservancy, Berlin.

- Hla-Shein, T. Soe-Soe, and K. Ne-Win (1998). "The level of knowledge, attitude and practice in relation to malaria in Oo-do village, Myanmar," *Southeast Asian Journal of Tropical Medicine and Public Health*, 29(3), pp. 546–549, 1998.
- Ifeanyi-Obi, C. C., and Iremesuk, P. (2018). Environmental Factors Influencing Artisanal Fishing in Eastern Obolo Local Government Area of Akwa Ibom State. *Journal of Agricultural Extension*, 22(1), 55-66.
- Iwasaki S, Razafindrabe B. H. N and Shaw R (2009). Fishery livelihoods and adaptation to climate change: a case study of Chilika Lagoon, India. *Mitig Adapt Strat Global Chang* 14:339–355
- Lee, M., Kang, B. A., and You, M. (2021). Knowledge, attitudes, and practices (KAP) toward COVID-19: a cross-sectional study in South Korea. *BMC Public Health*, (1), 1-10
- L. E. Udofia, F. Z. Uyanga, and E. B. Ogunkelu (2023). Malaria Prevalence and Treatment Seeking Behaviour of Campus Students in Mkpato Enin, Akwa Ibom State, Nigeria Publication of Faculty of Basic Medical Sciences, Ladoke Akintola University of Technology, Ogbomoso
- MRAG (2021) Fisheries and livelihood. Fisheries Management Science Programme (FMSP), Marine Resources Assessment Group (MRAG), and Department for International Development
- National Population Commission (2007). Results of the 2006 Population Census: National
- National Population Commission (2014), ICF International. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria. Rockville, Maryland, USA: NPC and ICF International; 2014.
- Nkeme, Kesit K. Namso N. Frank and Ubokudom E. Okon (2020); Household Poverty Status of Artisanal Contract Fishermen in South - South, Nigeria: A Comparative Analysis. *Journal of Agricultural Economics, Extension and Rural Development* 3(1):1-11
- Noland, G. S, Graves, P. M, Sallau, A. (2014). Malaria prevalence, anemia, and baseline intervention coverage prior to mass net distributions in Abia and Plateau States, Nigeria. *BMC Infect Dis*. 2014;14:168. doi: 10.1186/1471-2334-14-168. [[PMC free article](#)] [[PubMed](#)] [[CrossRef](#)] [[Google Scholar](#)]
- OECD (2001) Glossary of statistical terms. Organisation for Economic Co-operation and Development. <http://stats.oecd.org/glossary/detail.asp?ID=993>. Accessed 25 Oct 2024
- Prantik Das and V. V. Binoy (2026). Insights on Human Dimensions of Freshwater Fish Conservation in Jharkhand and Bihar, *African Health Sciences*, Vol 26 Issue 1, Accessed May 2026
- [Priyadarshi](#), Sambit, [S. N. Ojha](#), and [Arpita Sharma](#) (2019). An Assessment of Vulnerability of Fishers' Livelihood to Climate Change in Coastal Odisha. *Current World Environment* 14(1):60-67. DOI: [10.12944/CWE.14.1.08](https://doi.org/10.12944/CWE.14.1.08).
- Shonisani Tshivhase, [Ntsieni S. Mashau](#), and [Livhuwani Munyai](#) (2022). The Assessment of Community Knowledge and Prevention Practices of Malaria in a Rural Community in South Africa. *Public Health Journal* • DOI: [10.2174/18749445-v15-e2206142](https://doi.org/10.2174/18749445-v15-e2206142)

Sultana, M. S., Khan, A. H., Islam, M. R., Hossain, S., Hasan, M. T., Kurasaki, M., and Sikder, M. T. (2022). Gender differences in Knowledge, Attitude, and Preparedness to Respond to COVID-19 among the adult population in Bangladesh: A Cross-sectional Study. *Population medicine* 4(5): 1-11

World Health Organization (2017). World Malaria Report. Geneva: World Health Organization; 2017.