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The Perception and Behavioral Attitude of Young Care-givers on An Atlantic Ocean Coastal Community, Nigeria, towards Malaria. Paper 1

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ABSTRACT

Introduction: Malaria is still both a health and an economic burden to various communities in sub-Saharan Africa. Few studies have been conducted on perception of and behavioral pattern of young care-givers to malaria, especially in the populated communities along the Atlantic Ocean coastline in Nigeria.

Objective: The objective of this study was to assess perception and health seeking attitude of young caregivers who brought children to a malaria survey at Iyaafin, a community lying close to the Atlantic Ocean in Badagry Local Government Area (LGA), Lagos State of Nigeria.

Materials and Methods: All, apart from father or mother, who brought children to the study site for malaria evaluation at Iyaafin, Badagry LGA, between May and August 2014, were interviewed using an instrument of semi-structured questionnaire. Data was analyzed using NCSS21 statistical software.

Results: Of the 129 respondents, 66 (51.2%) were males and 63 (48.8%) females with an overall mean (±sd) age of 24.5(5.5), mostly (62, 48.1%) students, mostly (71, 55.0%) having secondary education with a high proportion (77, 59.7%) earning <N5,000 (US$33.3) monthly. A high proportion (114, 87.9%) of respondents identified malaria as the most common disease in the community and an equally high proportion (127, 98.4%) identified mosquito bites as the cause of malaria. Overall, 36 (27.9%) respondents had fever within 1 month prior to the study, including those currently having fever and one person that claimed he had fever everyday. In all, 33 (91.7%) of this 36 respondents had just one episode of fever and only 2 (5.6%) had more than two fever episodes. Significant but negative correlations were observed between age (r = -0.28, P-value = 0.001) on one hand and marital status (r = -0.25, R2 = 0.06, P-value = 0.004) on the other, with duration since last fever episode. In all, females were approximately twice as likely to visit health facility during febrile episode than males (χ^2=1.55, P-value=0.21, OR=1.75, 95% CI=0.72, 4.25) while males were 1.7 times more likely to take herbal medicinal tea during febrile episode (χ^2=2.16, P-value=0.14, OR=1.73, 95% CI=0.83, 3.61;

Conclusion: Non-parental care-givers living on the Atlantic Ocean coastal community in Lagos were mostly students and single with low economic power. Malaria was perceived as the most common disease in the community. Young care-givers most take traditional herbal medicine during febrile illness.

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Abbreviations
ACT = Artemisinine-based Combination Therapy
CI = Confidence Interval
LGA= Local Government Area
YCG = young care-givers
HIV/AIDS =Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
PPMV =Propriety Patient Medicine Vendor
OR = Odds ratio

Introduction

Despite decades of control and prevention efforts, malaria remains a major public health problem, stationed as a significant cause of morbidity and mortality in the tropical regions of the world with about 300 million cases reported globally and approximately one million deaths every year [1,2]. In 2015 alone, World Health Organization reported 214 million cases of malaria globally and 438,000 deaths, the fourth highest cause of death, accounting for 10% of child deaths in sub-Saharan Africa (SSA), taking the life of a child every 30 seconds [3,4]. More than 90% of the disease load are to be found in sub-Sahara Africa inflicting havoc especially on children under the age of five years and on pregnant women with little access to health care [5-7]. Barofsky et.al. refer to malaria as one of the major diseases of poor people

in developing countries and one of the leading causes of avoidable death, especially in children and pregnant women [8]. Malaria is viewed as one of the biggest health problems in SSA and that its contribution to illness and death in SSA has been a topic of pedagogical interest, political advocacy and speculation [9]. In Uganda, where malaria is holo-endemic in the north and meso to hypo-endemic in the south, it is the leading cause of mortality and morbidity, particularly among children and pregnant women. In Zanzibar, one of Africa's major islands, malaria transmission has declined significantly, from 35-40% prevalence in 1995 to less than 2% in 2010 [10,11]. In Nigeria, malaria remains a major cause of morbidity and mortality particularly among children under 5 years of age [12, 13]. P. falciparum malaria is the deadliest and most prevalent blood parasitic disease of humans, and globally, it is accountable for approximately a million deaths annually, with SSA accounting for greater than 90 percent of the malaria-induced mortality. P. falciparum malaria contributes to huge economic loss resulting from diminished productivity or low income connected with illness or death and other damages [14]. In Nigeria alone, over 50% outpatients' attendance and 40% of hospital admissions, 30% of child mortality and 10% of maternal mortality are due to malaria [14]. Yet, how the community perceives malaria, and community's behavioral attitude towards malaria are not prominent in malaria control efforts [15]. Perception, belief and attitudinal approach to an endemic disease differ from community to community and within a community, from group to group or individual to individual [16]. A compendium of such generalized or specific perception, beliefs and attitudes may be vital towards formulating strategies directed at malaria control [17]. Having a basic understanding of what the community knows about malaria, its epidemiology, symptomatology, prevention, severity, risk factors and who is at risk is a sine qua non to identifying and targeting vulnerable populations for a successful implementation and sustainability of efforts to control malaria [18]. Data on perception, attitude and practice of malaria among people living in communities on the Atlantic Ocean coastline is very rare. Direct interaction with structures within the community plays an important role in circumventing malaria spread [16, 19]. To effect a synergy between Policy makers, Non-Governmental Organizations, Public Health Physicians and the Community, there is an urgent need to determine community-based approach to malaria control and people's health-seeking practices [20]. Most studies conducted on knowledge, attitude and practice of malaria in Nigeria were in the hinterland and rarely can any study be found on the populated communities living on the Atlantic Ocean coastline where malaria is endemic because of stagnant waters. This study aimed to assess perception and behavioral attitude of non-parental care-givers to malaria and their health-seeking practices during febrile episodes that are assumed to be malaria-induced [20, 21].

Materials and Methods

This cross-sectional study, approved by the National Health Research Ethics Committee, (No. NHREC 04/04/2008 Ref. No. RFC/10/06/367) is part of a larger study which has already been published [21]. It was also an intrusion study in that an intervention protective clothing against malaria (pCAM) – was provided. In this regard, it was also a prophylactic trial aimed at preventing malaria. Iyaafin, an agrarian and traders' community in Badagry LGA of Lagos State, Nigeria, with a population of 3,000 people when the study took place lies on 6°25′N 2°53′E (Figure 1). Community consent for the study was sought and received from the community Traditional Head and other gate-keepers. Using simple random sampling technique, 150 house-holds with under-five children and their older siblings were identified. Identified household without under-fives was replaced by the immediate adjacent liveable dwelling. Prior to enrolment into the study, each care-giver, be it any of the parents, older sibling or grandparent, gave verbal informed consent. Inclusion criteria into the main study were fever, not a visitor and parental/care-giver's willingness to participate in the study. Exclusion criteria were evidence of severe acute malaria, severe anemia, congenital diseases, other chronic illnesses, on admission in a health facility, or refusal of parents/care-givers to participate in the study. For this part of the study, only non-parental care-givers of children who were brought for malariometric study were interviewed on their perception of and attitude towards malaria. Respondents were interviewed by three trained and experienced fieldworkers. Variables of interest in this part of the study included socio-demographic indices such as age, marital status, highest level of education, religion, occupation and monthly income. Also of interest were respondent's knowledge of common diseases in the community and the cause of the most common disease mentioned. The questionnaire then inquired about how long ago each respondent last had fever, the number of fever episodes each respondent had one month prior to the study, and their health seeking behavioral pattern such as the first and second step they took during fever episode.

Figure 1: Map of Nigeria, with Lagos State (insert), Atlantic Ocean and Badagry LGA

Training of Field-workers

For this part of the study, three of the five field-workers who had been given a 2-day training to acquaint them with conflict resolution, and inter-personal relationship with respondents were selected. The training they had included reviewing the survey questionnaire and apprehending the rationale behind each question, the arrangement of the questions, mode of dressing to the field and being polite to study participants.

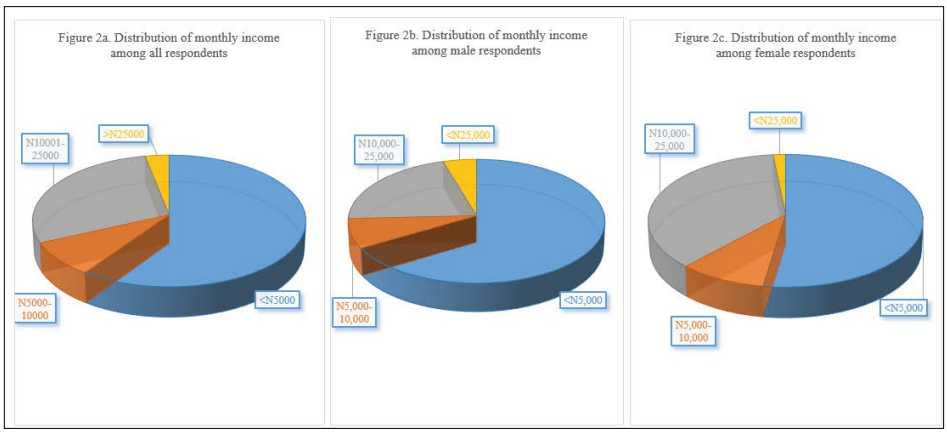
The intervention: It is pertinent to mention that the intervention, called "Moskeeto Armor®" is a pCAM manufactured by ING Activewear®, USA, an insecticide-treated protective clothing against malaria. Its fabrics tested in laboratory contained 1.26mg/m^2 of permethrin. The material was sewn as a shirt with hood and trouser, according to each child's measurement and given to each child in the study to wear daily, which could be washed when dirty and worn again.

Data entry and statistical analysis: Data were manually entered into an Excel spreadsheet, cleaned and coded for data security. Data entries that were inappropriate warranted field workers to return to the care-giver for correction. Data analysis was performed using NCSS 21 (Kaysville, Utah, USA) statistical software. Non-parametric tests were used for determining the significance of associations of variables. There was no missing data. Analysis

carried out included frequency of proportions, bivariate (cross-tabulation), and Pearson's correlation coefficient, adjusting for possible confounders. Continuous variables were compared between two groups by Student's t-test and between more than two groups by analysis of variance (ANOVA) expressing the results as mean (±standard deviation [SD]). Proportions were compared by χ^2 test with calculated Odds ratios (ORs) and 95% Confidence Intervals. Level of significance was set as $P < 0.05$. Data were presented as Tables, Map and Figures.

Results

Socio-demographic profile of the respondents shows that the mean (±sd) age (years) of the 129 young care-givers (YCG) was 24.5 (5.5) with no significant difference between male (n=66, 51.2%) and female (n=63, 48.8%) respondents, most of whom were in the age range of 25-29 years (n=46, 35.7%), students (n=62,48.1%) and singles (n=85, 65.9%). Although only 3 (2.3%) had no formal education (all females), 71 (55.0%) had secondary education (male: n=38, 57.6%; female: n=33, 52.4%) while majority (n=100, 77.5%) of the respondents were Christians (Table 1). A high proportion of the respondents had monthly income of <N5000 (approximately US$33.3) more among males (n=44, 66.7%) than females (n=33, 52.4%) (Figure 2). By all stratification, malaria was perceived as the most common disease among young people in the coastal community of study (114, 88.7%). Typhoid was mentioned as a common disease by only 12 (9.3%) of the respondents. Incidentally, HIV/AIDS was reported as a common disease only by 2 (1.6%) respondents, who had secondary as their highest level of education and who earned a monthly income of <N5000. Since a high proportion of the respondents mentioned malaria as the most common disease in their community, they were asked to mention as many causes of malaria they know, with the expectation of multiple responses. Again, almost all mentioned mosquito bite as the cause (127, 98.4%) while a relatively high proportion noted that staying long in the sun (87, 67.4%), hard work (57, 44.2%), drinking bad water (50, 38.8%) or eating oily food (35, 27.1%) are the causes of malaria. Incidentally, nobody mentioned dirty environment is related to malaria while only 6 (4.7%) respondents said that they did not know the cause of malaria (Table 2). Although their body temperature was not measured, 19 (14.7%) respondents noted that they were currently having fever and only 16 (12.4%) mentioned that they had fever either within past one month or past one year of the study. However, a relatively high proportion (31, 24.0%) said they had fever in past 3 months of the time of this study. As strange as it sounds, a respondent (1, 0.8%) said she never had fever and another (1, 0.8%) said that he had fever everyday (Table 3). Among the 36 (27.9%) who had fever within the past month of the study, currently having fever or supposedly have fever everyday, 33 (91.7%) had fever once in the past month, only 1(2.8%) had fever twice in the past month and 2 (5.6%) had fever more than twice in the past month. The highest mean number of fever episodes experienced by respondents occurred in the age group of 26-30 years (0.51±0.62) and lowest in those aged <20 years (0.16±0.37), among married respondents (0.50±0.66), among those with tertiary education (0.42±0.75) and among those whose monthly income was N5,000-N10,000 (Table 4). There was a significant but negative correlation (r= - 0.28, P-value = 0.001) between age (years) and duration (months) since last fever episode and (r = - 0.25, P-value = 0.004) between marital status and duration (months) since last fever episode. There was however a significant but positive correlation (r= 0.21, P-value = 0.02) between age (years) and number of fever episodes within the previous month and between marital status and number of fever episodes within the previous month (r= - 0.19, P-value = 0.034). The health-seeking behavior of the non-parental care givers during febrile episode is documented in Table 5. A relatively high proportion (45, 34.9%) of the respondents took herbal medicinal tea commonly referred to as "Agbo iba" or "herbal tea for fever" while a fewer proportion (36, 27.9%) either went to Patent and Propriety Medicine Vendors (PPMV [or chemist]) to purchase fever medication or anti-malaria drug and still fewer (25, 19.4%) visited a health facility for laboratory test to confirm the cause of their fever. A very few others (2, 1.6%), assuming the cause of their fever was malaria, engaged in self-medication with Artemisinin-based Combination Therapy (ACT) or quinine, or took Paracetamol (10, 7.8%) to reduce the fever. Surprisingly, lesser respondents (17, 13.2%; 23, 17.8% and 38, 29.5%) went to PPMVs, visited health facility or took "Agbo iba" as the next step taken in their health-seeking behavior. As the first step taken during a febrile episode, females (15, 23.8%) were approximately twice as likely to visit health facility (χ^2=1.55, P-value=0.21, OR=1.75, 95% CI=0.72, 4.25) than males (10, 15.2%) while males were 1.7 times more likely to take herbal medicinal tea (χ^2=2.16, P-value=0.14, OR=1.73, 95% CI=0.83, 3.61) than females. As the second step taken during a febrile episode, females were approximately 1½ as likely to visit health facility (χ^2=0.66, P-value=0.42, OR=1.46, 95% CI=0.59, 3.61) than males whereas males were 1.3 times more likely to take herbal medicinal tea (χ^2=0.36, P-value=0.55, OR=1.23, 95% CI=0.59, 2.70) compared to females.



(At the time of this study, US$1 was equivalent to N150)
(For all respondents: <N5000, n=77 or 59.7%; N5000-N10,000, n=11 or 8.5%; N10,001-N25,000, n=37 or 28.7%, <N25,000, n=4 or 3.1%)
(For male respondents: <N5000, n=44 or 66.7%; N5000-N10,000, n=5 or 7.6%; N10,001-N25,000, n=14 or 21.2%, <N25,000, n=3 or 4.6%)
(For female respondents: <N5000, n=33 or 52.4%; N5000-N10,000, n=6 or 9.5%; N10,001-N25,000, n=23 or 36.5%, <N25,000, n=1 or 1.6%)

Table 1: Socio-demographic profile of respondents.

Variable	Sub-variable	All (n=129)	Male (n=66, 51.2%)	Female (n=63, 48.8%)	χ^2	P-value	OR	95% CI
Age	Mean (±sd)	24.5 (5.5)	23.9 (5.0)	25.1 (6.0)	-	-	-	-
	<20	32 (24.8)	17 (25.8)	15 (23.8)	0.07	0.80	1.11	0.50, 2.47
	20-24	23 (17.8)	12 (18.2)	11 (17.5)	0.01	0.91	1.05	0.43, 2.59
	25-29	46 (35.7)	27 (40.9)	19 (30.2)	1.62	0.20	1.60	0.77, 3.32
	30-35	28 (21.7)	10 (15.1)	18 (28.6)	3.42	0.06	0.45	0.19, 1.06
Marital status	Single	85 (65.9)	54 (81.8)	31 (49.2)	12.25	0.00009	4.65	2.09, 10.31
	Married	44 (34.1)	12 (18.2)	32 (50.8)				
Highest level of education	No formal education	3 (2.3)	0 (0.0)	3 (4.8)	1.46*	0.23	0.00	undefined
	Primary	25 (19.4)	6 (9.1)	19 (30.1)	9.16	0.002	0.23	0.09, 0.63
	Secondary	71 (55.0)	38 (57.6)	33 (52.4)	0.36	0.55	1.23	0.62, 2.47
	Diploma	9 (7.0)	6 (9.1)	3 (4.8)	0.38*	0.54	2.00	0.48, 8.37
	Tertiary	21 (16.3)	16 (24.2)	5 (7.9)	5.15*	0.02	3.71	1.27, 10.86
Religious affiliation	Christianity	100 (77.5)	45 (68.2)	55 (87.3)	6.76	0.009	0.31	0.13, 0.77
	Islam	19 (14.7)	13 (19.7)	6 (9.5)	2.66	0.10	2.33	0.83, 6.57
	Traditional belief	6 (4.7)	6 (9.1)	0 (0.0)	4.13*	0.004	undefined	undefined
	Buddhism	4 (3.1)	2 (3.0)	2 (3.2)	0.00	1.00	0.95	0.13, 6.98
Occupation	Trader	26 (20.2)	4 (6.1)	22 (34.9)	14.94*	0.0001	0.12	0.04, 0.37
	Student	62 (48.1)	42 (63.6)	20 (31.7)	13.13	0.0003	3.76	1.81, 7.81
	Artisan	2 (1.5)	2 (3.0)	0 (0.0)	0.46	0.50	undefined	undefined
	Civil servant	11 (8.5)	5 (7.6)	7 (11.1)	0.15*	0.70	0.66	0.20, 2.18
	Others	5 (3.9)	4 (6.1)	1 (1.6)	0.74*	0.39	4.00	0.43, 36.8

Table 2: Frequency distribution of common diseases and cause of malaria among respondents

Variable	Item	All	Gender		Educational status					Monthly income (Naira)			
			Male	Female	None	Primary	Secondary	Diploma	Tertiary	<5000	-10000	-25000	>25000
		Freq. (%)											
Common diseases among young people in the community	Malaria	114 (88.7)	58 (87.9)	56 (88.9)	2 (66.7)	23 (92.0)	62 (87.3)	8 (88.9)	19 (90.2)	70 (90.9)	9 (81.8)	32 (86.5)	3 (75.0)
	Typhoid	12 (9.3)	7 (10.6)	5 (7.9)	1 (33.3)	2 (8.0)	6 (8.4)	1 (11.1)	2 (9.5)	5 (6.5)	2 (18.2)	5 (13.5)	0 (0.0)
	HIV/AIDS	2 (1.6)	1 (1.5)	1 (1.6)	0 (0.0)	0 (0.0)	2 (2.8)	0 (0.0)	0 (0.0)	2 (2.6)	0 (0.0)	0 (0.0)	0 (0.0)
	Diarrhea/ Dysentery	1 (0.8)	0 (0.0)	1 (1.6)	0 (0.0)	0 (0.0)	1 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)
Cause of malaria (multiple answers)	Mosquito bite	127 (98.4)	64 (97.0)	63 (100.0)	3 (100.0)	24 (96.0)	71 (100.0)	8 (88.9)	21 (100.0)	76 (98.7)	11 (100.0)	27 (73.0)	4 (100.0)
	Eating oily food	35 (27.1)	15 (22.7)	20 (31.7)	2 (66.7)	6 (24.0)	17 (23.9)	3 (33.3)	7 (33.3)	24 (31.2)	1 (9.1)	10 (27.0)	0 (0.0)
	Bad water	50 (38.8)	30 (45.5)	20 (31.7)	1 (33.3)	7 (28.0)	30 (42.3)	5 (55.6)	7 (33.3)	26 (33.8)	6 (54.5)	21 (56.8)	2 (50.0)
	Staying long in the sun	87 (67.4)	50 (75.8)	37 (58.7)	3 (100.0)	7 (28.0)	57 (80.3)	7 (77.8)	13 (61.9)	65 (84.4)	8 (72.7)	25 (67.6)	3 (75.0)
	Dirty environment	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Hard work	57 (44.2)	31 (47.0)	26 (41.3)	0 (0.0)	14 (56.0)	31 (43.7)	2 (22.2)	10 (47.6)	48 (62.3)	1 (9.1)	7 (18.9)	1 (25.0)
	Don't know	6 (4.7)	4 (6.1)	2 (3.2)	0 (0.0)	3 (12.0)	3 (0.0)	0 (0.0)	0 (0.0)	3 (3.9)	2 (18.2)	0 (0.0)	1 (25.0)

Table 3: Fever recall among young care givers living on an Atlantic Ocean coastal community

Variable	Response	All	Gender		Educational status					Monthly income (Naira)			
			Male	Female	None	Primary	Secondary	Diploma	Tertiary	<5000	-10000	-25000	>25000
		Freq. (%)											
Duration (months) since last fever episode	Never had fever	1 (0.8)	0 (0.0)	1 (1.6)	0 (0.0)	0 (0.0)	1 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.7)	0 (0.0)
	Currently having fever	19 (14.7)	12 (18.2)	7 (11.1)	1 (33.3)	5 (20.0)	9 (12.7)	0 (0.0)	4 (19.2)	10 (13.0)	2 (18.2)	6 (16.2)	1 (25.0)
	Within past 1 month	16 (12.4)	8 (12.1)	8 (12.7)	0 (0.0)	3 (12.0)	10 (14.1)	1 (11.1)	2 (9.5)	10 (13.0)	1 (9.1)	4 (10.8)	1 (25.0)
	Within past 3 months	31 (24.0)	12 (18.2)	19 (30.2)	2 (66.7)	6 (24.0)	17 (23.9)	2 (22.2)	4 (19.0)	18 (23.4)	3 (27.3)	10 (27.0)	0 (0.0)
	Within past 6 months	20 (15.5)	8 (12.1)	12 (19.0)	0 (0.0)	3 (12.0)	12 (16.9)	1 (11.1)	4 (19.0)	12 (15.6)	0 (0.0)	8 (21.6)	0 (0.0)
	Within past 1 year	16 (12.4)	9 (13.6)	7 (1.1)	0 (0.0)	4 (16.0)	8 (11.3)	0 (0.0)	4 (19.0)	9 (11.7)	3 (27.3)	4 (10.8)	1 (25.0)
	More than 1 year ago	25 (19.4)	16 (24.4)	9 (14.3)	0 (0.0)	4 (16.0)	13 (18.3)	5 (55.6)	3 (14.3)	18 (23.4)	2 (18.2)	4 (10.8)	1 (25.0)
	Everyday	1 (0.8)	1 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Those who reported having fever one month prior to the study (n=36)													
		n=36	n=21	n=15	n=1	n=8	n=20	n=1	n=6	n=20	n=4	n=10	n=2
Number of fever episodes within the previous month	1	33 (91.7)	19 (90.5)	14 (93.3)	1 (100.0)	7 (87.5)	19 (95.0)	1 (100.0)	5 (83.3)	18 (90.0)	3 (75.0)	10 (100.0)	2 (100.0)
	2	1 (2.8)	0 (0.0)	1 (6.7)	0 (0.0)	1 (12.5)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.0)	0 (0.0)	0 (0.0)	0 (0.0)
	>2	2 (5.6)	2 (9.5)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.0)	0 (0.0)	1 (16.7)	1 (5.0)	1 (25.0)	0 (0.0)	0 (0.0)

Table 4: Correlation coefficients between socio-demographic indices and duration since last fever episode as well as number of fever episodes within previous month

Variable	Item	Freq. (%)	Duration (months) since last fever episode	Number of fever episodes within the previous month
Age (years)	All	129 (100.0)	3.6 (1.7)	0.35 (0.58)
	<20	32 (24.8)	4.1 (1.4)	0.16 (0.37)
	20-25	35 (27.1)	4.0 (1.7)	0.29 (0.62)
	26-30	45 (34.9)	3.1 (1.8)	0.51 (0.62)
	31-35	17 (13.2)	2.9 (1.5)	0.41 (0.62)
Pearson's correlation coefficient			r = -0.28, R^2 = 0.08, P-value = 0.001	r = 0.21, R^2 = 0.05, P-value = 0.02
Marital status	Single	85 (65.9)	3.9 (1.7)	0.27 (0.52)
	Married	44 (34.1)	3.0 (1.6)	0.50 (0.66)
Pearson's correlation coefficient			r = -0.25, R^2 = 0.06, P-value = 0.004	r = 0.19, R^2 = 0.04, P-value = 0.034
Highest level of education	Non	3 (2.3)	2.3 (1.2)	0.33 (0.58)
	Primary	25 (19.4)	3.4 (1.8)	0.36 (0.57)
	Secondary	71 (55.0)	3.5 (1.7)	0.34 (0.56)
	Diploma	9 (7.0)	4.7 (1.7)	0.22 (0.44)
	Tertiary	21 (16.3)	3.5 (1.7)	0.42 (0.75)
Pearson's correlation coefficient			r = 0.14, R^2 = 0.02, P-value = 0.102	r = -0.01, R^2 = 0.000, P-value = 0.89
Monthly income	<N5000	77 (59.7)	3.7 (1.7)	0.34 (0.58)
	N5,000-N10,000	11 (8.5)	3.6 (1.9)	0.55 (0.93)
	N10,000-N25,000	37 (28.7)	3.2 (1.6	0.30 (0.46)
	>N25,000	4 (3.1)	3.5 (2.4)	0.50 (0.58)
Pearson's correlation coefficient			r = -0.12, R^2 = 0.02, P-value = 0.16	r = -0.002, R^2 = 0.00, P-value = 0.98

There was a significant but negative correlation (r= - 0.28, P-value = 0.001) between age (years) and duration (months) since last fever episode and (r= - 0.25, P-value = 0.004) between marital status and duration (months) since last fever episode. There was however a significant but positive correlation (r= 0.21, P-value = 0.02) between age (years) and number of fever episodes within the previous month and (r= - 0.19, P-value = 0.034) between marital status and number of fever episodes within the previous month (r= - 0.19, P-value = 0.034).

Table 5: Behavioral pattern of residents on Atlantic ocean coastal community during fever episodes relative to gender, educational status and monthly income

Variable	Item	All	Gender		Educational Status					Monthly income			
			Male	Female	None	Primary	Secondary	Diploma	Tertiary	<5000	-10000	-25000	>25000
What was the first thing you did when you had fever	Went to chemist shop	36 (27.9)	18 (27.3)	18 (28.6)	1 (33.3)	6 (24.0)	17 (23.9)	3 (33.3)	9 (42.9)	23 (29.9)	5 (45.5)	7 (18.9)	1 (25.0)
	Visited health facility!	25 (19.4)	10 (15.2)	15 (23.8)	2 (66.7)	6 (24.0)	13 (18.30	1 (11.1)	2 (9.5)	14 (18.2)	2 (18.2)	9 (24.3)	0 (0.0)
	Took ACT/Quinine	2 (1.6)	0 (0.0)	2 (3.2)	0 (0.0)	0 (0.0)	1 (1.4)	1 (11.1)	1 (4.8)	1 (1.3)	0 (0.0)	1 (2.7)	0 (0.0)
	Took Paracetamol	10 (7.8)	5 (7.6)	5 (7.9)	0 (0.0)	4 (16.0)	4 (5.6)	2 (22.2)	0 (0.0)	6 (7.8)	0 (0.0)	4 (10.8)	0 (0.0)
	Took herbal tea#	45 (34.9)	27 (40.9)	18 (28.6)	0 (0.0)	7 (28.0)	31 (43.7)	1 (11.1)	6 (28.6)	27 (36.1)	4 (36.4)	12 (32.4)	2 (50.0)
	Can't remember	4 (3.1)	2 (3.0)	2 (3.2)	0 (0.0)	2 (8.0)	2 (2.8)	0 (0.0)	0 (0.0)	2 (2.6)	0 (0.0)	2 (5.4)	0 (0.0)
	Others*	3 (2.3)	2 (3.0)	1 (1.6)	0 (0.0)	0 (0.0)	1 (1.4)	1 (11.1)	2 (9.5)	2 (2.6)	0 (0.0)	1 (2.7)	0 (0.0)
	Did nothing else	4 (3.1)	2 (3.0)	2 (3.2)	0 (0.0)	0 (0.0)	3 (4.2)	0 (0.0)	1 (4.8)	2 (2.6)	0 (0.0)	1 (2.7)	1 (25.0)
What was the next thing you did?	Went to chemist shop	17 (13.2)	9 (13.6)	8 (12.7)	0 (0.0)	3 (12.0)	12 (16.9)	0 (0.0)	2 (9.5)	13 (16.9)	0 (0.0)	4 (10.8)	0 (0.0)
	Visited health facility!!	23 (17.8)	10 (15.2)	13 (20.6)	0 (0.0)	4 (16.0)	11 (15.5)	1 (11.1)	7 (33.3)	12 (15.6)	1 (9.1)	9 (24.3)	1 (25.0)
	Took ACT/Quinine	1 (0.8)	1 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.8)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)
	Took Paracetamol	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Took herbal tea ##	38 (29.5)	21 (31.8)	17 (27.0)	3 (100.0)	7 (28.0)	17 (23.9)	5 (55.6)	6 (28.6)	21 (27.3)	4 (36.4)	12 (32.4)	1 (25.0)
	Can't remember	4 (3.1)	2 (3.0)	2 (3.2)	0 (0.0)	2 (8.0)	2 (2.8)	0 (0.0)	0 (0.0)	2 (2.6)	0 (0.0)	2 (5.4)	0 (0.0)
	Others**	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Did nothing else$$	46 (35.7)	26 (39.4)	20 (31.7)	0 (0.0)	9 (36.0)	29 (40.8)	3 (33.3)	5 (23.8)	29 (37.7)	6 (54.5)	10 (27.0)	1 (25.0)

*!females were approximately twice as likely to visit health facility during febrile episode than males (χ^2=1.55, P-value=0.21, OR=1.75, 95% CI=0.72, 4.25); #males were 1.7 times more likely to take herbal medicinal tea during febrile episode (χ^2=2.16, P-value=0.14, OR=1.73, 95% CI=0.83, 3.61); *include: took a bath, drank water; !!females were approximately 1½ as likely to visit health facility as the next step taken during febrile episode than males (χ^2=0.66, P-value=0.42, OR=1.46, 95% CI=0.59, 3.61); ##males were 1.3 times more likely to take herbal medicinal tea during febrile episode (χ^2=0.36, P-value=0.55, OR=1.23, 95% CI=0.59, 2.70; $males were approximately 1½ times more likely to do nothing after taking the first health-seeking step (χ^2=0.82, P-value=0.36, OR=1.40, 95% CI=0.68, 2.88);*

Discussion

A study on perception of and attitude towards malaria was undertaken to assess non-parental care-givers' perception about malaria with a view to determining treatment-seeking behaviour, not for the child this time around but for themselves during febrile episodes [22]. The results indicate that almost all the study participants knew that malaria was the commonest disease in the community and associated it primarily with mosquito bite. This observation is comparable to what was reported in some Ethiopian studies [23-26] but much higher than the 65% reported from Ghana [27] and the 35.2% reported from another study in Northern Nigeria [28]. A sizable proportion of respondents put forward misconception about the causative agent of malaria, though their misconceptions need deeper insight and further scientific probe, at least from Social Science perspective. For example, malaria was associated to staying long in the sun. This may be because the heat of the tropical sun draws a resemblance to the hotness of the body brought about by the illness. The agrarian society or the indigent students had no access to scientific explanation of microscopic parasite and its life cycle thus linking or describing the hotness of the body as the burning heat of the sun. Others were of the opinion that malaria is related to hard work but this is in reference to adolescents and young people, not in reference to children. Young people in this community work hard either in the farm or in other endeavors to earn daily subsistence with low wages and "hard work" being part of the community's existence, provides a believable platform for the cause of malaria. It is incredible that no respondent referred to dirty environment as playing a role in

the cause of malaria, though Culex mosquitoes that breed in dirty environment usually produce Japanese encephalitis, Lymphatic filariasis and West Nile fever which are very rarely reported in this community. Other misconceptions about the cause of malaria, such as eating oily food, have also been reported in various studies in malaria-endemic countries in SSA [29-32]. This study also observed that a few (25, 19.4%) of the care-givers visited formal health care facility as the first step during episode of fever and even less visited formal health care facility as the second step (23, 17.8%). The 34.9% respondents who used traditional herbal tea (Agbo Iba) was similar to the proportion that also used home prepared herbs such as neem (Azadirachta indica) or pawpaw (Carica papaya) leaves in Northern Ghana [27]. An ethno-botanical survey conducted in the same area identified indigenous flora with possible antimalarial attributes which may be further analyzed for antimalarial medications [33]. Studies have reported that, especially in SSA, people combine both traditional and orthodox methods for the treatment of malaria [34, 35] thus beliefs and actions taken during illness should be considered by health care providers [36]. Contrary to this, a study in Uganda reported that the people preferred allopathic treatment of malaria because they do not have the proper traditional cognition needed to utilize plants for malaria management [37]. Policy makers should take a closer look at self-medication as this practice raises several questions that require answers. In this study, a relatively high proportion of respondents either buy drugs from chemist (PPMV) or use either antimalarial or analgesics that were within reach at home. Self-medication with antimalarial, analgesics or other drugs seems popular in the community of study and needs to be addresses because of (i) the drug may have been contaminated, (ii) it may have expired (iii) it could produce adverse drug reaction (iv) it may be used in the wrong dosage, (v) it may be inadequate or over-adequate or (vi) it may be used under inappropriate condition. The 1.6% proportion of respondents who took either ACT or Quinine as self medication against malaria was much lower than the 60% reported in Benin, a neighbouring country or the 91.4% in Democratic Republic of Congo. Policy makers, Social Scientists and Researcher should probe more into self-medication, not only for malaria or febrile illnesses but also for other illnesses [38]. If self-medication is rampant among care-givers, it may also be the care that these care-givers apply self-medication to children during illness episodes, worsening the health condition of the child.

Conclusion

In conclusion, almost all respondents were aware that malaria was the commonest disease in the community but a relatively few still thought of the cause of the disease as "staying too long in the sun", "eating oily food" or "hard work" misconceptions that need further study for correction. Majority of the respondents of this study sought treatment for themselves first by either taking home-made herbal medicine (Agbo iba) or engaged in self-treatment with antimalarial medicines bought at chemists or PPMV. Researchers and Social Scientists should collect data on various aspects of home or community management of malaria for targeted interventions and to boost awareness and prevention of the disease, not only among caregivers but also among the population at large. This approach will further settle some discrepancies between perception, behavioral attitude and health seeking behaviour to effectively curb malaria menace in Africa generally and Nigeria in particular.

Strength and Limitations

Certain limitations in this study are worth considering. First, the sample size was not statistically determined as all the care givers who brought a child for malariometric examination were interviewed. These included those aged 35 years and below and excluded parents of the examined children [39]. This might have introduces selection bias to the study. Next, this study did not set out to investigate causal relationships due to the cross-sectional design of the study. Also, information obtained from the care-givers presumed fever was synonymous with malaria because of the high prevalence of malaria-induced fever in the area, though a relatively few fevers which may not be specifically malaria-induced, may originate from viral, bacterial or other infections [40]. Finally, the information harvested from the respondents were self-reports which could introduce a socially desirable bias. The strength of this study included support from Lagos State Government, Badagry Local Government Authority and that of the Traditional house keepers. Parents were very cooperative and the staff were well-trained.

Conflict of interest

The authors declare no conflict of interest

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