Galician medical journal 2019
Vol. 26, Issue 1, E201917
DOI: 10.21802/gmj.2019.1.7

Research Article

Home Based Management of Uncomplicated *P. falciparum* Malaria in Children Below Five Years in Delta State

John Edophe Arute[*1], Valentine Uche Odili[2]

Abstract

Background: The world health organization (WHO) estimates that every 45 seconds an African child dies of malaria while several others lay ill. Also, studies have shown that home-based management of malaria could improve prompt access to antimalarial medications for African children.

Objective: This study aimed at assessing the home based management practices among care givers of children below five years in Delta State.

Methods: This study was a descriptive cross-sectional survey used to assess the home based management practices of malaria in children under age five. 459 consenting Caregivers of children under five (6 to 59 months) were purposively selected from different churches during Sundays and Wednesdays midweek services through balloting from two communities in Central and North Senatorial Districts of Delta State (Oghara and Obiaruku). Prior to the commencement of the study, the caregivers were thoroughly counselled on the objectives of the study, and a pretested structured interviewer administered questionnaire was used for administration in English, Urhobo and Ukwuani languages.

Results: The study revealed that 86.93% respondents have good knowledge of malaria, and 60% commenced treatment within 24hrs. It also showed that 58.4% preferred anti-malarial combination therapies with arthemether-lumefantrine combination accounting for 34.0% drug options. Drug sources for home based malaria management were mainly from Pharmacy 40.5%, Drug sellers such as chemist 55.1% while information sources on choice of therapy and dosage were mainly from chemist 32.7%; health personnel 25.7%; neighbours 7.5% and self-based on previous experience 36.6%.

Conclusion: The study revealed very good knowledge of malaria and good management practices as well as good treatment seeking behaviours amongst the caregivers.

Keywords
malaria; home-based management; practices; children; caregivers.

[1]*Department of Clinical Pharmacy and Pharmacy Administration, Faculty of Pharmacy, Delta State University, Abraka, Nigeria*
[2]*Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, University of Benin, Benin City, Nigeria*
***Corresponding author**: arute4john@yahoo.com

Problem statement and analysis of the latest research

Malaria is the leading cause of morbidity and mortality among children below five years of age in sub-Saharan Africa. The World Health Organization (WHO) estimates that every 45 seconds an African child dies of malaria while several others lay ill[1]. In Nigeria, it constitutes the highest disease burden among children and accounts for 30% of all child-

hood deaths [2]. Malaria has also been shown to be responsible for high school absenteeism, neurodisability and impairment of cognitive development in children [3, 4].

It is estimated that 92% of these deaths occur at home; hence, mothers and caregivers are of foremost importance in recognizing mild or severe malaria disease and seeking treatment for their wards. Most caregivers begin treatment at home with antimalarial drugs and antipyretics bought from patent medicine stores [5, 6], without a prescription and usually administered in inappropriate doses [7]. Thus, less than 15% of the malaria episodes treated at home are treated correctly.

Prompt and effective treatment of all children with malaria is a critical element of malaria control. Treatment with effective antimalarial therapy is essential and African leaders have committed to ensuring that 80% of malaria episodes are adequately treated within 24hours of onset of symptoms [8].

Home-based management of malaria is a broad concept which encompasses hygiene, nutrition, lifestyle, environmental factors, socio-economic factors and self-medication. Home-based practices of malaria among caregivers of children below five years are an important determinant which ensures restoration of sound health to the child. A number of research works have been done to assess the reason for the increase in morbidity and mortality rates of malaria infection in children below five years. Although, the economic burden of malaria in sub-Saharan Africa especially among children below five years of age has been assessed previously, the extent and variation of this burden remains unclear. Home-based management of malaria could improve prompt access to antimalarial medications for African children as documented by several studies which have investigated home based management practices of malaria caregivers in children below five years and beyond in various parts of Nigeria and beyond [9, 10, 11]. Although these studies made significant observations as to the knowledge level of these care givers, their preferred source of drugs and their drug treatment practices, there still exists gaps as to the home management practices in Delta State hence the need for this study. This is a part of a larger study examining malaria management practices in children below 5 years with ethical approval of the Hospitals Management Board of Delta State with reference number A551/188. We undertook here to assess the level of knowledge of malaria, self-care practices and drug treatment patterns and practices and health seeking behaviour among care givers.

1. Materials and Methods

1.1 Study Design

This study was a cross-sectional survey used to assess the home based management practices of malaria in children below five.

1.2 Study Setting

The study is a descriptive, cross sectional study carried out in two purposively selected communities from Central and North Senatorial Districts of Delta State (Oghara and Obiaruku). Delta State comprises of 25 Local Government Areas with various ethnic groups. The major ones are Urhobo, Igbo, Isoko, Itsekiri and Ijaw. These ethnic groups share a common ancestry, as such their culture presents with elements of similarity. It is an oil and agricultural producing State of Nigeria with a population of 4,098,291 people (males: 2,674,306 females: 2,024,085).

Oghara is a town in Ethiope West Local Government Area of Delta State. It is one of the major clans of the Urhobo ethnic group. It has various educational institutions which include primary schools, secondary schools and tertiary institutions such as the Delta State Polytechnic situated in Otefe and the Western Delta University situated in Ogharefe-Oghara. The Delta State University Teaching Hospital is also located in Oghara and it is one of the two tertiary health institutions in the State. Oghara is made up of three sub-clans namely Ovade, Ogharefe and Ogharefe governed by a chieftancy system with the Ovie of Oghara as King. The major occupation of the Oghara people is farming and the land is rich in agricultural produce such as Palm Oil, Rubber, Cassava and Plantain. The Oghara people are well-known for their hospitality and

Straight-forwardness. Oghara plays host to a number of oil and gas companies. Amongst these is Pan Ocean which has its flow station at Ovade in Oghara. Presently there are about ten petroleum depots in Oghara.

Obiaruku town is a well grown town extending 18 km North of the River Ethiope and a predominant trade zone found in the southern part of Nigeria. It shares borders to the North with the Benin division, on the South by her inherent brothers the Akashiada clan, on the West by the Urhobos and the South East by fellow Ukwuani's, Umukwata. The geographical position of Obiaruku places the town at focal point of trade between her boundary counterparts, the Akashiadas, the Urhobos, the Ikas and her former heritage the Idus. The town is a growing rural centre and headquarters of the Ukwuani Local Government council area the last in three Local Government Areas given to the second largest ethnicity in Delta State of Nigeria. Obiaruku settlers are inherent farmers and fisher men, yams and cassava cultivated for subsistence and export.

1.3 Study Population

The study population was made up of caregivers (mothers) of children below 5 years who fell within the age range of 18-62 years.

1.4 Sample and Sampling Technique

A total number of 459 consenting caregivers were randomly selected for the study from different churches on different Sunday's and Wednesdays during midweek services through balloting. This was to ensure that different categories of the caregivers were represented. The samples were drawn from caregivers in the two senatorial districts of Delta State.

1.5 Instrumentation for Data Collection

A pretested structured interviewer administered questionnaire was used. The questionnaires were administered in English, Urhobo and Ukwuani languages. The purpose of the questionnaire was explained to the respondents before administration. Effort was made to maintain respondent confidentiality by omitting their names to create a sense of awareness that the information provided could not be linked to them.

1.6 Sample Size Determination and Data Analysis

.

A total of 459 respondents were used in this study. Data collected was entered into Microsoft Excel, rechecked for accuracy and loaded into the Statistical Package for Social Sciences (SPSS) version 21 IBM USA for descriptive statistics.

1.7 Ethical Consideration

In addition to the ethical approval obtained from the Hospitals Management Board with reference number A551/188 as stated above, approval was also obtained from the pastors-in-charge and parish priests of churches used.

2. Results

2.1 Socio-demographic Profile of Respondents

Table 1 shows the socio-demographic of the respondents. 24.4% of caregivers fall within the age brackets of 20 – 25 years, 22% (26 – 30 years), 22.7% (35 – 40) and 11.1% above 40 years. 19.2% of the caregivers had only one child under their car 47.2% had two while 18.1% and 20% had three and above three under their care respectively and 48.6% of respondents were married, majority (89.5%) had on form of education or the other, while majority (43.6%) were businessmen and woman, 18.3% had formal employment and 6.3% were house wives while 22% were either artisans or students.

2.2 Knowledge of Caregivers towards Malaria

Majority of the respondents knew that mosquito bite is the cause of malaria, 48.4% identified fever as sign/symptoms of malaria, 31.2% headache, 12.4% and 2.6% as shivering and body pain respectively also 70.8% identified symptoms as high fever, while 17.6% and 13.5% as persistent cough and convulsion as most alarming symptoms respectively (Tab. 2).

Table 1. Socio-demographics of Caregivers N=459

Variables		Frequency	%
Gender of Caregiver	Females	335	73.0
	Males	124	27.0
Relationship With Child	Mother	291	63.4
	Father	79	17.2
	Guardian	89	19.4
Age of Caregiver	20-25 years	112	24.4
	26-30 Years	101	22.0
	31-40 Years	104	22.7
	>40 Years	51	11.1
Number of Children under care	1 Child	88	19.2
	2 Children	196	42.7
	3 Children	83	18.1
	>3 Children	92	20.0
	Single	38	8.3
Marital Status	Married	223	48.6
	Separated	34	7.4
	Widowed	11	2.4
Education	None	48	10.5
	Primary	60	13.1
	Secondary	134	29.2
	Tertiary	207	45.1
Occupation	Farming	6	1.3
	Business	200	43.6
	Informal Employment	29	6.3
	Formal Employment	84	18.3
	House Wife	39	8.5
	Others	101	22.0

2.3 Malaria Home Management Practices of caregivers

The self-care and home management practice of caregivers is shown in Table 3. Their responses indicated that 60% commenced treatment of malaria immediately the symptoms were identified and 9.2% had other options such as not treating or just observing. On the reasons for which treatment may not have commenced immediately, 24.8% adduced there was no drug at home, while 5.0% said there was no money, 15.9% felt it may not be serious while 54.2% agreed to usually waiting to observe. The respondents also identified their preferred first point of call to be the hospital (78.9%) with poor consultations to pharmacy and patent medicine stores.

2.4 Drug Treatment Practice

The responses of caregivers on the various drugs adopted for home management of malaria is shown in Table 4. The most preferred drug used for treatment by the respondents was arthemether-lumenfrantrine combination (34%). Source of information on choice of therapy were predominantly health personnel with 36.6% based on previous experience. Sources of drugs used as well as their correct dosage for treatment were predominantly from health personnel and previous experiences with financial constraints as the reason adjudged for home

Table 2. Caregivers Level of Knowledge on Malaria

Question	Responses N=459	F	%
Knowledge of Transmission	Mosquito bite	399	86.9
	Drinking Dirty Water	25	5.4
	Dirty Surroundings	20	4.4
	Others	15	3.3
Knowledge of Signs and Symptoms Malaria	Fever	222	48.4
	Shivering	57	12.4
	Body Pains	12	2.6
	Loss of Appetite	37	8.0
	Headache	143	31.2
Perception of Alarming Symptoms	Convulsion	62	13.5
	Persistent Cough	35	7.6
	Persistent Diarrhea	37	8.1
	High Fever	325	70.8

Table 3. Malaria Home Management Practices of Caregivers

Question	Responses N=459	F	%
Timing For Treatment Initiation	Immediately	257	60.0
	Later than 24Hours	132	28.8
	After 2-3 Days	28	6.10
	Others	42	9.2
Reasons for Late Treatment Initiation	No Drugs at Home	114	24.8
	No Money	23	5.0
	Not Serious	73	15.9
	Usually Wait and See	249	54.2
Duration of Treatment Delay	Within 1 Day	332	72.3
	2-3 Days	113	24.6
	Above 3 Days	24	5.23
Preferred First Point of Call	Home	33	7.2
	Hospital	362	78.9
	Pharmacy	32	7.0
	Patent Medicine Store	32	7.0

Table 4. Drug Treatments Used for Home Management of Malaria

Question	Responses N = 459	F	%
Most Preferred Malaria Therapy	Antimalaria Monotherapy	98	21.4
	Antimalaria Combination Therapy	268	58.4
	Antimalaria Herbs	23	5.0
	Others	70	15.3
Most Preferred Drugs Utilized	Chloroquine	47	10.2
	Fansidar	45	9.8
	Quinine	98	21.4
	Arthemether-Lumefsntrine Combination Therapy	156	34.0
	Others	113	24.6
Source of Information on Choice of Therapy	Chemist	150	32.7
	Health Personnel	118	25.7
	Neighbours	23	5.0
	Self-Based on Previous Experience	168	36.6
Source of Drug Used for Therapy	Friends	15	3.3
	Pharmacy	186	40.5
	Drug Sellers Such as Chemist	253	55.1
	Left Over from Previous Hospitals	5	1.1
Source of Information on Dosage	Drug Seller	163	35.5
	Self-Based on Previous Experience	216	47.1
	Physician	48	10.5
	Others	32	7.0
Reasons for Home Based Treatment	No Money	248	54.0
	High Cost of Treatment	187	40.7
	Distance of Health Facility	8	1.7
Action Taken if Symptoms Persist	Visit Hospital	284	61.9
	Herbal	104	22.7
	Others	71	15.5
Preventive Practices	Mosquito Nets	174	37.9
	Maintain Clean Surroundings	155	33.8
	Take Herbs	50	10.9
	Indoor Spray	80	17.4

based management of malaria.

3. Discussion

3.1 Knowledge of Caregivers towards Malaria

The study revealed a very good knowledge of malaria as majority of respondents know that malaria is caused through the bite of mosquito as well as their

ability to identify the signs and symptoms to include fever, shivering, headache, loss of appetite and body pains. These observations are in tandem with symptoms observations of earlier studies by Chukwuocha *et al*. [12]; Okeke and Okafor [13], and Chukwuocha [9] that identified fever, headache, body pain and cough. Likewise, several Ugandan based studies like ACTwatch Group [14, 15] and Tabuti [16], have reported a significant association of fever with malaria with two studies reporting high association of fever to malaria in 2009 and 2012 respectively. This very good knowledge of malaria as regards vector of transmission and causes have also been reported in another study by Zayyad *et al*. [17] in which more than half of respondents reported good knowledge of malaria in a University community in Northern Nigeria. This study however does not agree with the reports of Press [18] which found respondents associating cause of malaria to heat from sun light, fried food and hard work. This improvement in knowledge may be due to improved public health education of malaria to residents in the area.

3.2 Malaria Self Care Practices of in the Home

The study revealed that more than half of the care givers commenced malaria treatment immediately it was diagnosed or symptoms were identified while few of them did after 24 hours. This practice of early treatment of malaria is in line with the malaria treatment guidelines of the WHO which recommends that treatment of malaria episodes should commence at least within 24hours of onset of symptoms [8]. However, this is not in line with those reported in other parts of Africa like Ghana, Ethiopia and Tanzania where high delay for commencement of malaria treatment has been reported among caregivers of children [19, 20, 21, 22]. In exceptional cases of non-commencement of early treatment, non-availability of drugs and personal symptom observation to ensure adequate treatment were adjudged for such practices. They however submitted that in cases of persistent symptoms, their preferred first point of call was the hospital for most respondents while others patronized pharmacy and patent medicine stores respectively. The caregiver's attitude towards obtaining care from the hospital was higher than that reported by Chukwuocha [9], who also observed that caregivers obtained care from patent medicine stores and the use of herbal remedies.

3.3 Pattern of Drug Treatment Practices of Malaria Care givers

Treatment options for caregivers revealed that a small number preferred antimalarial herbs and other options of therapy while majority of them preferred antimalarial combination therapy, only a few preferred anti malaria monotherapy. The high use of antimalaria combination therapy is in line with the new malaria treatment policy of the WHO [1, 23] for the handling of malaria resistant parasites. The percentage use of ACTs was also higher than that reported by Chukwuocha [9], these findings contradict earlier reports on the high use of chloroquine for malaria management at home [5, 9, 24]. Although the use of other drugs such as Fansidar and Quinine has been previously reported by Zayad *et al*. [17] and Chukwuocha [9], this study also reported the use of other options such as herbal remedies as reported by Wilcox and Bodeker [25], Palafox *et al*. [26] and Uguru *et al*. [27].

Majority of respondents admitted that the choice of therapy was from previous experiences and the chemist while a few got their choice of therapy from health personnel and neighbors. The drug they used for treatment were obtained mainly from the pharmacy and patent medicine sellers. These observations are in line with that reported by Palafox *et al*. [26] Uguru *et al*. [27] and Uzochukwu *et al*. [28] that information sources for home management of uncomplicated malaria were usually from diverse sources such as community pharmacists, community extension health workers, patent medicine sellers and herbalists.

Relative to the reasons given for home management of malaria, it was identified that high cost of treatment and lack of money were all responsible for the choice of home management. This observation has been previously reported by Uzochukwu *et al*. [28, 29] that cost of malaria diagnostic tests and

treatment were major influencers of self-treatment options for malaria in Nigeria. The preventive practices also reported in this study where using mosquito nets, maintaining clean surroundings, taking herbs and using indoor sprays that agrees with those earlier reported by Okeke *et al*. [5] and Musoke *et al*. [30]

4. Conclusions

The study concluded that there exists a very good knowledge of malaria amongst the caregivers. Early commencement of treatment by the caregivers was very high and this fell within the 24 hours as recommended by the WHO treatment guidelines for malaria. Although self-medication practices also persisted, this was influenced by their previous experiences with treatment options gotten from health personnel and high cost of treatment. Drug treatment pattern of care givers was mostly antimalarial combinations and hospitals were their first point of call in cases were malaria symptoms persisted than usual after their attempt to manage the situation.

Conflict of Interest

The authors stated no conflict of interest.

References

[1] WHO. Scaling-up home-based management of malaria: from research to implementation. Geneva: WHO (WHO/HTM/MAL/2004.1096), 2010; p 35.

[2] Federal Ministry of Health (Nigeria) National Antimalarial Treatment Policy, Abuja, Nigeria (Federal Ministry of Health, 2005).

[3] Kihara M, Carter JA, Newton CR. The effect of plasmodium on cognition: a systematic review. Tropical Medicine and International Health. 2006; 11(4):386-397. DOI: https://doi.org/10.1111/j.1365-3156.2006.01579.x [PMid:16553922]

[4] John CC, Bangirana J, Opoka RO, Idro R, Jue KAM, Wu B, Boivin MJ. Celebral malaria in children is associated with long-term cognitive impairment. Paediatrics. 2008; 122:92-99. DOI: https://doi.org/10.1542/peds.2007-3709 [PMid:18541616 PMCid:PMC2607241]

[5] Okeke TA, Uzochukwu BS, Okafor HU. An in-depth study of patent medicine sellers' perspectives on malaria in a rural Nigerian community. Malaria Journal. 2006; 5:97-103. DOI: https://doi.org/10.1186/1475-2875-5-97 [PMid:17078875 PMCid:PMC1635422]

[6] Goodman C, Brieger W, Unwin A, Mills A, Meek S, Greer G. Medicine sellers and malaria treatment in sub-Saharan Africa: what do they do and how can their practice be improved? American Journal of Tropical Medicine and Hygiene. 2007; 77:203-218. DOI: https://doi.org/10.4269/ajtmh.2007.77.203 [PMid:18165494 PMCid:PMC2657822]

[7] WHO. Scaling-up home-based management of malaria: from research to implementation. Geneva:WHO(WHO/HTM/MAL/2004.1096), 2004.

[8] WHO/RBM. Global strategic plan 2005-2015, 2005.

[9] Chukwuocha U. Rapid assessment of home management of malaria among caregivers in parts of south eastern Nigeria. The Pan African Medical Journal. 2011; 10:29. [PMid:22187611 PMCid:PMC3240927]

[10] Adeneye AK, Jegede AS, Mafe MA, Nwokocha EE. Community perceptions and home management of malaria in selected rural communities of Ogun state, Nigeria. International Journal of Malaria Research and Reviews. 2013; 1(3): 22-34.

[11] Kassam R, Collins J, Sekiwunga R. Assets and challenges facing caregivers when

managing malaria in young children in rural Uganda. Malaria Journal. 2016; 15:467. DOI: https://doi.org/10.1186/s12936-016-1521-1 [PMid:27618985 PMCid:PMC5020540]

[12] Chukwuocha UM, Osuagwu AE, Dozie INS, Nwoke BEB, Onwuliri COE, Ukaga CN. The clinical pattern and complications of severe malaria in parts of the Imo River Basin of Nigeria. Nigerian Hospital Practice. 2009; 3(6):76-79. DOI: https://doi.org/10.4314/nhp.v3i6.45421

[13] Okeke TA, Okafor HU. Perception and treatment seeking behavior for malaria in rural Nigeria- Implications for control. Journal of Human Ecology. 2008; 24(3):215-222. DOI: https://doi.org/10.1080/09709274.2008.11906117

[14] ACTwatch Group. Household survey report (baseline) Republic of Uganda 03/09-04/09. http://apps.who.int/medicinedocs/documents/s18455en/s18455en.pdf (accessed 09.09.18), 2009.

[15] ACTwatch Group. Household survey Uganda 2012 survey report, http://www.actwatch.info/sites/default/files/content/publications/attachments/ACTwatch%20HH%20Report%20Uganda%202012.pdf (accessed 09.09.18), 2013.

[16] Tabuti JSR. Herbal medicines used in the treatment of malaria in Budiope county, Uganda. Journal of Ethnopharmacology. 2008; 116, 33-42. DOI: https://doi.org/10.1016/j.jep.2007.10.036 [PMid:18054454]

[17] Zayyad MA, Bala J, Labaran KS. Home-based treatment of malaria in children under five years: pattern and practice among mothers in a university community in north western Nigeria. Nigerian Journal of Pharmaceutical Sciences. 2016; 15(2) 39-45.

[18] Press I. Problems in the definition and classification of medical systems. Social Science and Medicine Med Anthropology. 1980; 14B(1):45-57. DOI: https://doi.org/10.1016/0160-7987(80)90040-X

[19] Ahorlu CK, Koram KA, Ahorlu C, de Savigny D, Weiss M. Sociocultural determinants of treatment delay for childhood malaria in southern Ghana. Tropical Medicine and International Health. 2006; 11: 1022-1031. DOI: https://doi.org/10.1111/j.1365-3156.2006.01660.x [PMid:16827703]

[20] Kamat VR, Nyato DJ. Community response to artemisinin-based combination therapy for childhood malaria: a case study from Dar es Salaam, Tanzania. Malaria Journal. 2010; 9:61. DOI: https://doi.org/10.1186/1475-2875-9-61 [PMid:20187949 PMCid:PMC2842283]

[21] Kassile T, Lokina R, Mujinja P, Mmbando BP. Determinants of delay in care seeking among children under five with fever in Dodoma region, central Tanzania: a cross-sectional study. Malaria Journal. 2014; 13:348. DOI: https://doi.org/10.1186/1475-2875-13-348 [PMid:25182432 PMCid:PMC4159519]

[22] Mitiku I, Assefa A. Caregivers' perception of malaria and treatment-seeking behaviour for under five children in Mandura District, West Ethiopia: a cross-sectional study. Malaria Journal. 2017; 16(1)144. DOI: https://doi.org/10.1186/s12936-017-1798-8 [PMid:28390423 PMCid:PMC5385040]

[23] WHO. World malaria report 2015. Geneva: World Health Organization; 2015.

[24] Orimadegun AE, Amodu OK, Olumese PE, Omotade OO. Early home treatment of childhood fevers with ineffective antimalarials is deleterious in the outcome of severe malaria. Malaria Journal. 2008;

7. DOI: https://doi.org/10.1186/1475-2875-7-143

[25] Willcox ML, Bodeker G. Traditional herbal medicines for malaria. BMJ. 2004; 329: 1156-1159. DOI: https://doi.org/10.1136/bmj.329.7475.1156 [PMid:15539672 PMCid:PMC527695]

[26] Palafox B, Patouillard E, Tougher S, Goodman C, Kara H. ACTwatch: evidence for malaria medicine and policy. Outlet Survey Report (Baseline), Nigeria 2009. www.actwatch.info/results

[27] Uguru NP, Onwujekwe OE, Tasie NG, Uzochukwu BS, Ezeoke UE. Do consumers' preferences for improved provision of malaria treatment services differ by their socioeconomic status and geographic location? A study in southeast Nigeria. BMC Public Health. 2010; 10: 7. DOI: https://doi.org/10.1186/1471-2458-10-7 [PMid:20051103 PMCid:PMC3397432]

[28] Uzochukwu BSC, Ezeoke OP, Emma-Ukaegbu U, Onwujekw OE, Sibeudu FT. Malaria Treatment Services in Nigeria: A Review. Nigerian Medical Journal. 2010; 51(3): 114-119.

[29] Uzochukwu BSC, Obikeze EN, Onwujekwe OE, Onoka CA, Griffiths UK. Cost-effectiveness analysis of rapid diagnostic test, microscopy and syndromic approach in the diagnosis of malaria in Nigeria: implications for scaling-up deployment of ACT. Malaria Journal. 2009; 8: 265. DOI: https://doi.org/10.1186/1475-2875-8-265 [PMid:19930666 PMCid:PMC2787522]

[30] Musoke D, Karani G, Ssempebwa JC, Etajak S, Guwatudde D, Musoke MB. Knowledge and practices on malaria prevention in two rural communities in Wakiso District, Uganda. African Health Science. 2015; 15(2): 401-412. DOI: https://doi.org/10.4314/ahs.v15i2.13 [PMid:26124785 PMCid:PMC4480479]

Received: 2019-01-07

Revised: 2019-02-24

Accepted: 2019-03-17