

**PATTERN OF KNOWLEDGE AND PERCEPTION OF MALARIA RAPID
DIAGNOSTIC TEST AMONG DIFFERENT PROFESSIONAL RANKS OF MEDICAL
DOCTORS IN A STATE TEACHING HOSPITAL, SOUTHEAST NIGERIA**

Ndibuagu Edmund O.

*Department of Community Medicine and Primary Health Care, Enugu State University College
of Medicine, Parklane, Enugu, NIGERIA.*

Submitted on: December 2017

Accepted on: January 2018

For Correspondence

Email ID:

edmund.ndibuagu.esut.edu.ng

Abstract

Malaria infection is still of public health importance globally, particularly in Nigeria. The recommendation is that diagnosis of malaria is confirmed through parasite-based blood test before commencing treatment. The objective of this study was to determine the pattern of knowledge and perception on malaria rapid diagnostic test for medical doctors working in departments that manage malaria cases in a tertiary hospital. It was a cross-sectional study.

A whole population study of doctors in the General Outpatient, Internal Medicine, and Paediatrics departments of a teaching hospital in Nigeria. Total of 91 copies of the questionnaire was distributed, while 86 were returned for analysis. Mean overall percentage knowledge score for all medical doctors across the three departments was 70.0%, with those in the General Outpatient department recording 70.8%, Internal medicine 60.3%, and 77.9% for Paediatrics. Registrars recorded the highest percentage knowledge score of 75%. Mean Overall percentage positive perception by medical doctors across the three departments was 83.4%, with those in General Outpatient department scoring 93.8%, those in Internal Medicine department 75.9%, and those in Paediatrics department 82.9%. Medical Officers recorded the highest percentage positive perception score of 96.9%.

The mean overall percentage score recorded on both knowledge and perception were above 60%. This could be an indication of favorable disposition of medical doctors in this hospital to implement the WHO/Federal government policy of confirming the diagnosis of malaria before initiating treatment; if the enabling environment for this is put in place by the management of the hospital.

Keywords: Knowledge, Perception, Malaria, Rapid, Diagnostic, Test, Medical Doctors

Introduction

Malaria is a parasitic disease that is transmitted through the bite of a female

Anopheline mosquito. The causative parasite is of the genus Plasmodium, which has four species that commonly infect man,

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

and a rare species known as *Plasmodium knowlesi*, which is monkey malaria parasite that has been reported to infect a man in the forest region of South-East Asia. The four common *Plasmodium* species are *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale*, and *Plasmodium malariae*.^[1] This disease is still of public health importance, with 212 million cases estimated to have occurred globally in 2015, and 90% of these being recorded in the World Health Organization (WHO) African Region. It is further estimated that 429,000 persons died of malaria globally in 2015, with 92% of these deaths occurring in WHO African Region.^[2]

In Nigeria, malaria is a disease of public health importance with about 50% of the population suffering at least one episode of malaria infection, while under-5years children record an average of 2–4 attacks of malaria annually.^[3] In the year 2006, 60% of outpatient attendance, 30% inpatient admissions, and 11% of maternal deaths were attributable to malaria infection in Nigeria.^[4] In 2009, malaria was seen as constituting a significant burden on families, communities, health system, and workforce in Nigeria.^[5] It was estimated in 2015, that the total malaria death in Nigeria was 26% of the global figure.^[2]

For many years, treatment of suspected cases of malaria was usually commenced in the endemic countries without laboratory confirmation of the diagnosis.^[6] This presumptive approach to management of suspected malaria cases led to over, and irrational use of anti-malaria drugs; which further resulted in the development of resistance to most of the drugs in use.^[7] In 2009, it was found that over 50% of malaria treatment done in Enugu state, Nigeria, which is the study area of this research was initiated without laboratory confirmation of malaria diagnosis.^[8] In the 2nd Edition of Malaria

Treatment guidelines developed by WHO in 2010, it was stated that parasitological diagnosis of malaria should be made before initiation of malaria treatment, except in situations where it is not feasible.^[9] Nigeria keyed into this WHO recommendation by inserting it into the 2011 National guidelines for diagnosis and treatment of malaria and taking steps to ensure that this practice is adopted in the health facilities.^[10] This parasite-based diagnosis of malaria is usually done through microscopy or malaria rapid diagnostic test (mRDT), but microscopy is the gold standard for making a diagnosis of malaria.^[11] Presumptive diagnosis and treatment of malaria were still being significantly practiced in endemic African countries up to the year 2012, when WHO came up with *T3 (Test, Treat, and Track) initiative*. It was found that in about half of the endemic African countries, more than 80% of malaria treatment was done presumptively.^[12] This T3 initiative was designed to improve access to diagnosis, treatment, and surveillance of malaria.

Since 2010 when WHO commenced the promotion of parasite-based diagnosis of malaria, the proportion of malaria cases receiving the parasitological test in the public health facilities globally increased from 40% to 76% in 2015. Malaria rapid diagnostic test largely accounted for this, contributing 74% of diagnostic testing among suspected malaria cases in 2015.^[2] However, in Nigeria and most other endemic countries, the use of mRDT is still low,^[13] in spite of some research findings showing that the mRDT is as reliable as microscopy in making a diagnosis of malaria in Nigeria, and also cost-effective.^[8,14] Health authorities in Nigeria, in an effort to further promote the implementation of parasite-based diagnosis of malaria, stated the second objective of the Nigeria National Malaria Strategic Plan 2014 - 2020 to be "*All persons with suspected malaria who*

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

seek care are tested with RDT or microscopy by 2020”.^[15] To achieve this objective, it is important that all medical doctors involved in caring for patients with fever possess adequate knowledge and correct perception of mRDT, so as to adopt the practice of conducting a parasitological testing of all fever cases before prescribing anti-malaria medication. This is particularly crucial for doctors who work in teaching hospitals, which are the apex referral hospitals for fever cases. Doctors working in the General Outpatient, Internal Medicine, and Paediatrics departments usually manage fever cases in teaching hospitals. Assessment of knowledge and perception of malaria rapid diagnostic test among the different professional ranks of the doctors will assist in identifying the gaps among these ranks, and developing targeted interventions to address the identified gaps. The main objective of this study was to assess the pattern of knowledge and perception of mRDT among the different ranks of doctors working in the general Outpatient, Internal medicine, and Paediatrics departments of a state government-owned teaching hospital in Nigeria.

Materials and Methods

Study Area: This study was conducted in Enugu State University Teaching hospital, Nigeria; which is the apex referral hospital owned by the Enugu state government. The only other Teaching hospital in Enugu state and two other tertiary health facilities in the state are owned by the Federal government of Nigeria. Nigeria is administratively divided into thirty-six states and a federal capital territory, and Enugu state is one of the five states in the Southeastern geopolitical zone of the country. In addition to all the usual services provided in a teaching hospital, the Enugu State University Teaching Hospital provides services in all the clinical departments, but

doctors in the General Outpatient, Internal Medicine, and Paediatrics departments were enrolled into this study because they are the ones with the usual responsibility of managing fever cases in the hospital. There is no provision of Point-Of-Care diagnosis of malaria in any department of the hospital. Parasitological diagnosis of malaria in the hospital is usually done through microscopy in the hospital laboratory.

Study Design: This study was an observational, descriptive, cross-sectional study. Information on certain aspects of mRDT selected to assess the knowledge and perception of the medical doctors were elicited.

Study Population: All the medical doctors working in the General Outpatient, Internal Medicine, and Paediatrics departments were eligible for this study; with the exclusion of two Professors (one in General Outpatient department, and one in Paediatrics department). Twenty four doctors were eligible in the General Outpatient department, thirty-two in Internal Medicine department, and thirty-five in the Paediatrics department; giving a total of ninety-one. These were the medical doctors that usually have the responsibility of managing fever cases in the hospital. Doctors working in the other departments or outside the hospital were also excluded from the study.

Sample Size: The research was whole population study involving all medical doctors in the General Outpatient, Internal Medicine, and Paediatrics departments. All the 24 eligible medical doctors in the General Outpatient department participated, while out of all the 32 working in the Internal Medicine department, thirty completed and returned the questionnaire. All the eligible 35 doctors working in the Paediatrics department were given the questionnaire to complete, but 32 completed and returned the questionnaire. A total of 86 respondents participated in the study.

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

Study Instrument: Self-administered, structured questionnaire was used for this study. This instrument was pre-tested in September 2016 at the University of Nigeria Teaching hospital, Enugu, which is the Federal Government owned Teaching hospital in the state. The questionnaire was arranged in the following sections; (a) Socio-demographic information, (b) Knowledge on malaria rapid diagnostic test, and (c) Perception of malaria rapid diagnostic test.

Data Collection Method: One doctor from each of the departments that were studied, was recruited to collect data from the department. The objective of the research was fully explained to the respondents, and their consent obtained prior to the administration of the questionnaire. All respondents that participated, completed and submitted the questionnaire in October 2016. The questionnaire was self-administered.

Data Management: The variables were measured in terms of frequency and percentage and interpreted as correct/incorrect knowledge, or positive/negative perception. Statistical Package for Social Sciences (SPSS) version 20.0 was used in analyzing information generated. Overall knowledge and perception of the respondents on malaria rapid diagnostic test were determined, and Pearson's Chi-Square test was used in some cases to confirm the significance of some findings.

Ethical Consideration: Ethical clearance for this study was obtained from the Enugu State University College of Medicine Research Ethics committee. Permission was obtained from the Heads of the three departments from which medical doctors were recruited for this study. Informed

consent was secured from all the respondents, and they were assured that information volunteered by them will be treated with utmost confidentiality.

Limitation of The Study: Though the results were expressed in percentages of the number of medical doctors in each professional rank, in each department; the possibility of having misleading results still exists, because of the very wide margin between the number of doctors in different ranks. For instance, the number of Medical Officers that participated in the study was very few when compared to the Registrars. Randomly selecting equal samples from the different ranks of a larger population of medical doctors would have given more reliable findings. This, however, could not be done since this study was a whole population study.

Results and Discussion

A self-administered questionnaire was given to each of the 91 eligible medical doctors, and 86 of them completed and returned their own questionnaire; giving a response rate of 94.5%. Twenty four (27.9%) were working in the General Outpatient department, thirty (34.9%) in the Internal Medicine department, and thirty-two (37.2%) in the Paediatrics department.

Socio-Demographic Characteristics Of Respondents: Equal number of males and females participated in the study. Most of them (91.7%) were between 24 to 45 years of age, Igbo by tribe (96.5%), all married (100%), and 89.5% were Christians. In their professional ranking, the majority were Registrars [45(52.3%)], followed by Senior Registrars [15(17.4%)]. Consultants and House Officers had an equal number of respondents [11(12.8%)], followed by Medical Officers [4(4.7%)].

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

Table 1: Socio-demographic characteristics of respondents

Variables Respondents	N (%)
Departments	
General Out-Patient Department	24 (27.9)
Internal Medical Department	30 (34.9)
Paediatrics Department	32 (37.2)
Sex	
Female	43(50)
Male	43(50)
Age at last birthday	
Less than 24years	0(0)
24 - 30 years	16 (18.6)
31 - 35 years	29 (33.7)
36 - 40 years	24 (27.9)
41 - 45 years	10 (11.6)
46 - 50 years	2 (2.3)
51 - 55 years	1 (1.2)
56 - 60 years	3 (3.5)
61 yrs and above	1 (1.2)
Tribe	
Igbo	83 (96.5)
Esan	2 (2.3)
Idoma	1 (1.2)
Marital Status	
Married	77 (89.5)
Single	6 (7.0)
Divorced/Separated	2 (2.3)
Widowed	1 (1.2)
Religion	
Christianity	86 (100)
Professional Rank	
House Officer	11 (12.8)
Registrar	52 (60.5)
Senior Registrar	8 (9.3)
Medical Officer	4 (4.7)
Consultant	11 (12.8)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

Basic Knowledge of Malaria Rapid Diagnostic Test Among The Different Professional Ranks, Across The Three Departments

House Officers, Registrars and Consultants demonstrated highest percentage score each in two of the ten items used for assessment. House Officers were most knowledgeable on mRDT not being superior to microscopy, and mRDT not being 100% specific. Registrars were most knowledgeable on mRDT detecting Circulating malaria parasite antigen in the blood, and a Laboratory Scientist not compulsorily being the person to perform mRDT. The Consultants, on the other hand, demonstrated superior knowledge on the mRDT result being read 15 to 20 minutes after performing the test, and mRDT kit not consisting of only one type. Medical Officers demonstrated highest percentage score on four items. These are a parasite-based examination of blood being a certain

method of confirming malaria infection, the parasitological test being done through microscopy or rapid diagnostic test, mRDT being the quick parasitological test for malaria diagnosis, and mRDT being usually specific for one or more species of malaria parasite. The Senior Registrars did not record highest percentage knowledge score on any of the items investigated.

Surprisingly, House Officers who were expected to be the least knowledgeable, since they recently qualified as medical doctors; demonstrated superior knowledge on mRDT not being superior to microscopy, and mRDT not being 100% specific. Knowledge acquired through recent intense reading in preparation for the degree examination could have contributed to the relatively impressive level of knowledge demonstrated by the House Officers. All the House Officers that participated in the study work in the Internal Medicine department.

Table 2: Basic knowledge of Malaria Rapid Diagnostic Test among the different professional ranks, across the three departments.

Question	Professional Rank	Correct Response
Parasite-based examination of the blood is the certain method of confirming malaria infection	House Officer	8 (72.7%)
	Registrar	50 (96.2%)
	Senior Registrar	7 (87.5%)
	Medical Officer	4 (100.0%)
	Consultant	9 (81.8%)
	OVERALL	78 (90.7%)
Parasitological test can be done through microscopy or rapid diagnostic test	House Officer	9 (81.8%)
	Registrar	49 (94.2%)
	Senior Registrar	6 (75.0%)
	Medical Officer	4 (100.0%)
	Consultant	9 (81.8%)
	OVERALL	77 (89.5%)
MALARIA RAPID DIAGNOSTIC TEST is the quick parasitological test for malaria diagnosis	House Officer	10 (90.9%)
	Registrar	49 (94.2%)
	Senior Registrar	6 (75.0%)
	Medical Officer	4 (100.0%)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

	Consultant	10 (90.9%)
	OVERALL	79 (91.9%)
MALARIA RAPID DIAGNOSTIC TEST is usually specific for one or more species of malaria parasite	House Officer	4 (36.4%)
	Registrar	30 (57.7%)
	Senior Registrar	2 (25.0%)
	Medical Officer	3 (75.0%)
	Consultant	8 (72.7%)
	OVERALL	47 (54.7%)
MALARIA RAPID DIAGNOSTIC TEST detects Circulating malaria parasite antigen in the blood	House Officer	4 (36.4%)
	Registrar	29 (55.8%)
	Senior Registrar	1 (12.5%)
	Medical Officer	2 (50.0%)
	Consultant	4 (36.4%)
	OVERALL	40 (46.5%)
MALARIA RAPID DIAGNOSTIC TEST result should be read 15 to 20 minutes after the test	House Officer	1 (9.1%)
	Registrar	17 (32.7%)
	Senior Registrar	2 (25.0%)
	Medical Officer	1 (25.0%)
	Consultant	4 (36.4%)
	OVERALL	25 (29.1%)
MALARIA RAPID DIAGNOSTIC TEST is superior to microscopy	House Officer	9 (81.8%)
	Registrar	40 (76.9%)
	Senior Registrar	4 (50.0%)
	Medical Officer	2 (50.0%)
	Consultant	6 (54.5%)
	OVERALL	61 (70.9%)
MALARIA RAPID DIAGNOSTIC TEST is 100% specific	House Officer	10 (90.0%)
	Registrar	43 (82.7%)
	Senior Registrar	4 (50.0%)
	Medical Officer	3 (75.0%)
	Consultant	8 (72.7%)
	OVERALL	68 (79.1%)
MALARIA RAPID DIAGNOSTIC TEST ought to be done always by a Laboratory Scientist	House Officer	8 (72.7%)
	Registrar	45 (86.5%)
	Senior Registrar	5 (50.0%)
	Medical Officer	3 (75.5%)
	Consultant	8 (72.7%)
	OVERALL	69 (80.2%)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

There is only one type of Malaria Rapid Diagnostic Test Kit	House Officer	6 (54.5%)
	Registrar	38 (73.1%)
	Senior Registrar	3 (37.5%)
	Medical Officer	1 (25.0%)
	Consultant	9 (81.9%)
	OVERALL	57 (66.3%)

The mean overall percentage knowledge score of all medical doctors across the three departments was 70.0%

One would have expected that the Consultants who are the most qualified would have recorded the highest percentage

knowledge score across the board, followed by the Senior Registrars, Registrars or Medical Officers, and lastly the House Officers. This pattern did not emerge; rather Registrars recorded the highest mean percentage knowledge score of 75%.

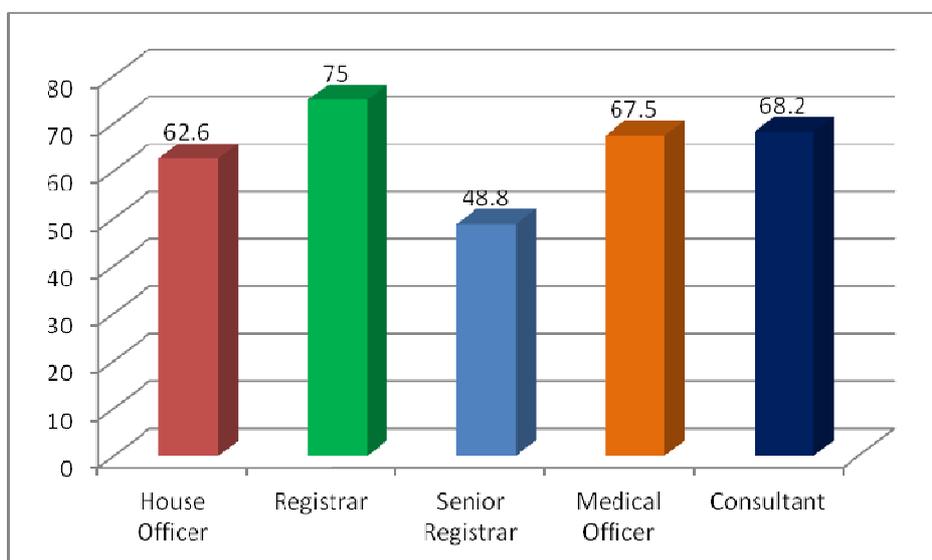


Fig 1: Mean percentage knowledge score of the different ranks of doctors across the three departments

They were followed by the Consultants (68.2%), Medical Officers (67.5%), House Officers (62.6%), and lastly Senior Registrars (48.8%). This high level of knowledge exhibited by the Registrars could be as a result of intense reading in preparation of the Part one Fellowship examination that Resident doctors usually sit at this stage of their training. Consultants and Senior Registrars are usually not under such academic pressure comparatively. The Senior Registrars focus on one topic, which might not be on malaria for their

dissertation, while the Consultants (especially those that are not lecturers) might not perceive any strong need to update their knowledge. Further research efforts are needed to unravel the factors that affect the knowledge of different professional ranks of medical doctors on mRDT. The Senior Registrar rank recording the least score is worrisome since they are the next in rank to the Consultants and usually take a crucial decision on managing malaria cases. The Registrars and all the other ranks down the line are bound to abide

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

by the decisions made by the Consultants and Senior Registrars. It is therefore very important that efforts are made to update the knowledge of particularly the Consultants and Senior Registrars on mRDT and management of malaria generally

Basic Knowledge of Malaria Rapid Diagnostic Test Among Different Professional Ranks Of Doctors In The General Outpatient Department: The General Outpatient department is under the

control of Community Medicine department, and hence House Officers are usually not posted there. On the other hand, Medical Officers in the hospital usually work in the General Outpatient, and Accident /Emergency departments. In the General Outpatient department, 50.0% of medical doctors that participated in this study were of the rank of Registrars, 20.8% were Senior Registrars, 16.7% were Medical Officers, while 12.5% were Consultants.

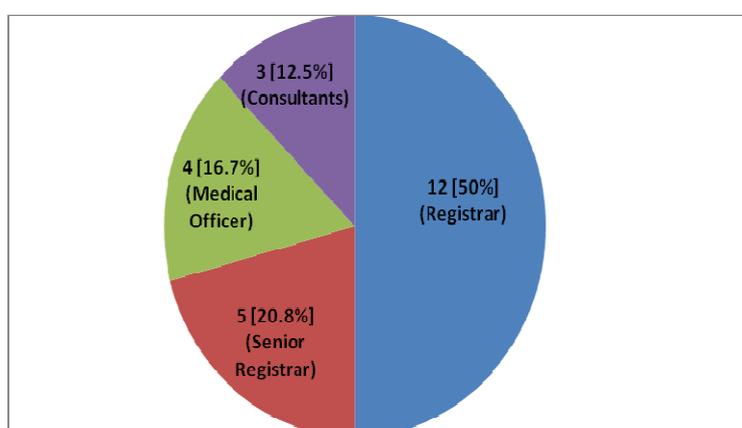


Fig 2: Distribution of Professional Rank of Medical Doctors in the General Outpatient Department

The Consultant and Medical Officer ranks exhibited the highest level of knowledge each on four of the ten items used in assessing mRDT knowledge of medical doctors in the General Outpatient department; with all the doctors in both ranks knowing that the certain method of confirming a diagnosis of malaria is through a blood test. All the Consultants also knew that mRDT is not superior to microscopy, mRDT not 100% specific, and mRDT kit not being only of one type. Again, all the Medical Officers knew that parasitological test can be done through microscopy or rapid diagnostic test, and mRDT being the quick parasitological test for malaria; while 75% of them (which was the highest score) knew that mRDT is usually specific for one

or more species of malaria parasite. All the Senior Registrars knew that it is not compulsory for mRDT to be performed always by trained Laboratory Scientist, but 60% of them knew that mRDT detects circulating malaria parasite antigen in the blood. This 60% was, however, the highest score on that item. All the Registrars equally knew that Parasite-based blood examination is the certain method of confirming a diagnosis of malaria. They also all knew that mRDT is the quick parasitological test for making a diagnosis of malaria infection. However, only 41.7% of them (which also was the highest score) knew that mRDT should be read 15 to 20 minutes after the test.

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

The pattern of knowledge on mRDT recorded among medical doctors in the General Outpatient department revealed that Consultants and Medical Officers scored highest on four of the items assessed, followed by Registrars scoring highest on three items and finally Senior Registrars with the highest score on two items. Since the Consultants were the highest on the ladder, they were expected to have superior knowledge as eventually recorded. The Medical Officers attend to patients every working day of the week, thus being more

disposed to gaining knowledge on malaria management through experience, than doctors in the other ranks that do not attend to patients daily at the General Outpatient department. This could account for the equally high knowledge demonstrated. It is, however, important to note that Pearson’s Chi-Square test did not reveal any significant difference in mRDT knowledge among the different ranks of doctors in the General Outpatient department of the study hospital.

Table 3: Basic knowledge of malaria rapid diagnostic test among different Professional ranks of medical doctors in the General Outpatient Department

Question	Professional Rank	Correct Response
Parasite-based examination of the blood is the certain method of confirming malaria infection	Registrar	12 (100%)
	Senior Registrar	4 (80%)
	Medical Officer	4 (100%)
	Consultant	3 (100%)
	OVERALL	23 (95.8%)
		Pearson’s Chi-Square = 0.265
Parasitological test can be done through microscopy or rapid diagnostic test	Registrar	11 (91.7%)
	Senior Registrar	4 (80%)
	Medical Officer	4 (100%)
	Consultant	2 (66.7%)
	OVERALL	21 (87.5%)
		Pearson’s Chi-Square = 0.460
MALARIA RAPID DIAGNOSTIC TEST is the quick parasitological test for malaria diagnosis	Registrar	12 (100%)
	Senior Registrar	4 (80%)
	Medical Officer	4 (100%)
	Consultant	2 (66.7%)
	OVERALL	22 (91.7%)
		Pearson’s Chi-Square = 0.187
MALARIA RAPID DIAGNOSTIC TEST is usually specific for one or more species of malaria parasite	Registrar	8 (66.7%)
	Senior Registrar	3 (60%)
	Medical Officer	3 (75%)
	Consultant	2 (66.7%)
	OVERALL	16 (66.7%)
		Pearson’s Chi-Square = 0.640

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

MALARIA RAPID DIAGNOSTIC TEST detects Circulating malaria parasite antigen in the blood	Registrar	7 (58.3%)
	Senior Registrar	3 (60%)
	Medical Officer	2 (50%)
	Consultant	1 (33.3%)
	OVERALL	13 (54.2%)
Pearson's Chi-Square = 0.733		
MALARIA RAPID DIAGNOSTIC TEST result should be read 15 to 20 minutes after the test	Registrar	5 (41.7%)
	Senior Registrar	0 (0.0%)
	Medical Officer	1 (25%)
	Consultant	1 (33.3%)
	OVERALL	7 (29.2%)
Pearson's Chi-Square = 0.148		
MALARIA RAPID DIAGNOSTIC TEST is superior to microscopy	Registrar	8 (66.7%)
	Senior Registrar	4 (80%)
	Medical Officer	2 (50%)
	Consultant	3 (100%)
	OVERALL	17 (70.8%)
Pearson's Chi-Square = 0.801		
MALARIA RAPID DIAGNOSTIC TEST is 100% specific	Registrar	8 (66.7%)
	Senior Registrar	4 (80%)
	Medical Officer	3 (75%)
	Consultant	3 (100%)
	OVERALL	18 (75.0%)
Pearson's Chi-Square = 0.799		
MALARIA RAPID DIAGNOSTIC TEST ought to be done always by a Laboratory Scientist	Registrar	8 (66.7%)
	Senior Registrar	5 (100%)
	Medical Officer	3 (75%)
	Consultant	2 (66.7%)
	OVERALL	18 (75.0%)
Pearson's Chi-Square = 0.814		
There is only one type of Malaria Rapid Diagnostic Test Kit	Registrar	7 (58.3%)
	Senior Registrar	4 (80%)
	Medical Officer	1 (25%)
	Consultant	3 (100%)
	OVERALL	15 (62.5%)
Pearson's Chi-Square = 0.358		

The mean overall percentage knowledge score of doctors in the General Outpatient department was 70.8%

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

Basic Knowledge of Malaria Rapid Diagnostic Test Among Medical Doctors In The Internal Medicine Department:

Most of the medical doctors that participated in the study, in the Internal Medicine department were Registrars (46.7%). Next were the House Officers (36.7%), the Consultants (13.3%), and finally the Senior Registrars (3.3%). This is the only

department that had House Officers at the time of the study. The department also had only one Senior Registrar. This means that in the Senior Registrar rank, only 100% or 0% could be recorded. This obviously may not be useful in comparing and drawing conclusions as to the level of mRDT knowledge among medical doctors of that rank.

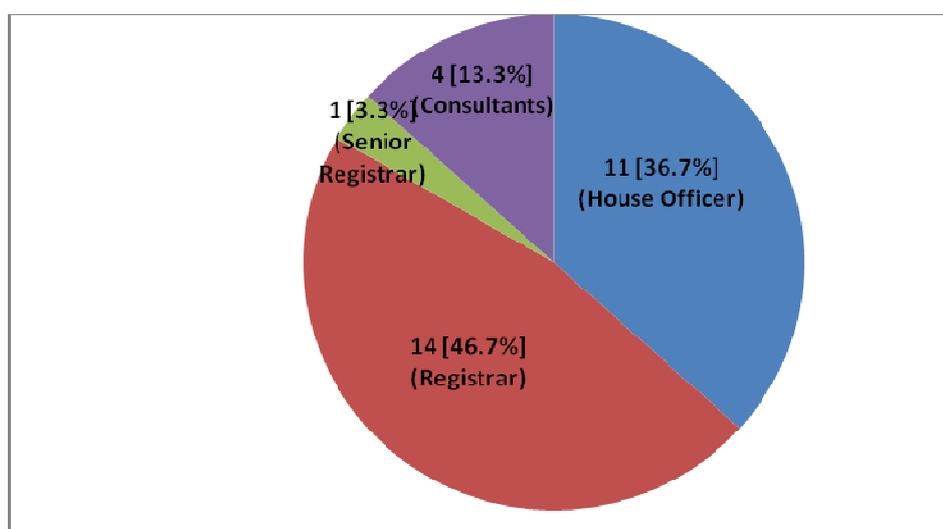


Fig 3: Distribution of Professional Rank of Medical Doctors in the Internal Medicine Department

Ignoring the Senior Registrar rank, Registrars demonstrated superior knowledge on five items studied, which include; parasite-based blood examination being the certain method of confirming malaria infection, malaria parasite test being done through microscopy or rapid diagnostic test, mRDT detecting circulating malaria parasite antigen in the blood, mRDT being read 15 to 20 minutes after the test, and mRDT not compulsorily performed by trained Laboratory Scientist. All the medical doctors in the Internal Medicine department exhibited very poor knowledge on the areas of mRDT detecting circulating malaria parasite antigen in the blood, and mRDT to be read 15 to 20 minutes after the test; to the extent that 50% and 21.4% knowledge

scores respectively by Registrars were the highest scores. The Consultants who actually should take a final decision with respect to referred and possibly complicated malaria cases seen in the hospital apparently did not demonstrate impressive knowledge of mRDT. None of the Consultants that participated in the study knew that mRDT result should be read 15 to 20 minutes after the test, and none also knew that mRDT is not superior to microscopy. Again, only one Consultant out of the four that participated knew that mRDT detects Circulating malaria parasite antigen in the blood. The Consultants, however, had the highest percentage knowledge score on mRDT being a quick parasitological test for malaria

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

diagnosis, and mRDT being specific for one or more species of malaria parasite.

Generally, among the different professional ranks of medical doctors working in the Internal Medicine department, Chi-Square test revealed significant knowledge gaps in four, out of the ten items used in assessing knowledge. These areas are; mRDT being the quick

parasitological test for malaria diagnosis ($P = 0.011$), mRDT result being read 15 to 20 minutes after the test ($P = 0.013$), mRDT not being superior to microscopy ($P = 0.006$), and mRDT not compulsorily done by trained Laboratory Scientist ($P = 0.006$). This is a pointer to the mRDT training need in that department.

Table 4: Basic Knowledge of malaria rapid diagnostic test among medical doctors in the Internal Medicine Department

Question	Professional Rank	Correct Response
Parasite-based examination of the blood is the certain method of confirming malaria infection	House Officer	8 (72.7%)
	Registrar	13 (92.9%)
	Senior Registrar	1 (100%)
	Consultant	2 (50%)
	OVERALL	24 (80%)
	Pearson's Chi-Square = 0.528	
Parasitological test can be done through microscopy or rapid diagnostic test	House Officer	9 (81.8%)
	Registrar	12 (85.7%)
	Senior Registrar	1 (100%)
	Consultant	3 (75%)
	OVERALL	25 (83.3%)
	Pearson's Chi-Square = 0.481	
MALARIA RAPID DIAGNOSTIC TEST is the quick parasitological test for malaria diagnosis	House Officer	10 (90.9%)
	Registrar	13 (92.9%)
	Senior Registrar	1 (100%)
	Consultant	4 (100%)
	OVERALL	27 (90%)
	Pearson's Chi-Square = 0.011	
MALARIA RAPID DIAGNOSTIC TEST is usually specific for one or more species of malaria parasite	House Officer	4 (36.4%)
	Registrar	2 (14.3%)
	Senior Registrar	0 (0.0%)
	Consultant	3 (75%)
	OVERALL	9 (30%)
	Pearson's Chi-Square = 0.100	
MALARIA RAPID DIAGNOSTIC TEST detects Circulating malaria parasite antigen in the blood	House Officer	4 (36.4%)
	Registrar	7 (50%)
	Senior Registrar	0 (0.0%)
	Consultant	1 (25%)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

	OVERALL	12 (40%)
	Pearson’s Chi-Square = 0.099	
MALARIA RAPID DIAGNOSTIC TEST result should be read 15 to 20 minutes after the test	House Officer	1 (9.1%)
	Registrar	3 (21.4%)
	Senior Registrar	0 (0.0%)
	Consultant	0 (0.0%)
	OVERALL	4 (13.3%)
	Pearson’s Chi-Square = 0.013	
MALARIA RAPID DIAGNOSTIC TEST is superior to microscopy	House Officer	9 (81.8%)
	Registrar	10 (71.4%)
	Senior Registrar	0 (0.0%)
	Consultant	0 (0.0%)
	OVERALL	19 (63.3%)
	Pearson’s Chi-Square = 0.006	
MALARIA RAPID DIAGNOSTIC TEST is 100% specific	House Officer	10 (90.9%)
	Registrar	12 (85.7%)
	Senior Registrar	0 (0.0%)
	Consultant	3 (75%)
	OVERALL	25 (83.3%)
	Pearson’s Chi-Square = 0.192	
MALARIA RAPID DIAGNOSTIC TEST ought to be done always by a Laboratory Scientist	House Officer	8 (72.7%)
	Registrar	11 (78.6%)
	Senior Registrar	0 (0.0%)
	Consultant	2 (50%)
	OVERALL	21 (70%)
	Pearson’s Chi-Square = 0.006	
There is only one type of Malaria Rapid Diagnostic Test Kit	House Officer	6 (54.5%)
	Registrar	7 (50%)
	Senior Registrar	0 (0.0%)
	Consultant	2 (50%)
	OVERALL	15 (50%)
	Pearson’s Chi-Square = 0.826	

The mean overall percentage knowledge score for medical doctors in the Internal Medicine department is 60.3%

Basic Knowledge of Malaria Rapid Diagnostic Test Among Different Professional Ranks Of Medical Doctors In The Paediatrics Department: Medical

doctors in the Paediatrics department that participated in this study were mainly Registrars (81.3%), followed by Consultants (12.5%), and lastly Senior Registrars

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”
 (6.3%). No House Officer was serving in the department at the time of this study.

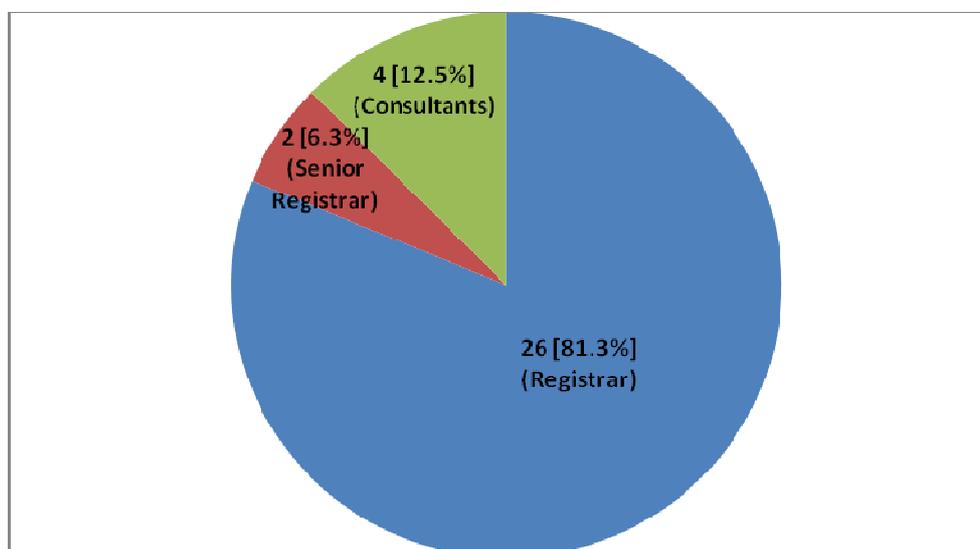


Fig 4: Distribution of Professional Rank of Medical Doctors in the Paediatrics Department

Consultants in the Paediatrics department demonstrated a good level of knowledge, at least 50% of them responded correctly to all the items used in assessing mRDT knowledge in this study. All of them correctly responded to five of the items as shown in table 4 below. This probably is an indication that the Consultants who actually take a final decision on the management modality of any malaria patient in the department are knowledgeable enough on mRDT, which has significantly reduced the Turn-Around-Time for the parasitological diagnosis of malaria infection. Although the department had only two Senior Registrars at the time of this study, these two demonstrated the most impressive level of

knowledge on the items used for knowledge assessment. They responded correctly to all the questions asked. The Senior Registrars are the next to the Consultants in the hierarchy, hence this very high level of knowledge will assist in ensuring that malaria cases are managed better. The Registrars constituted 81.3% of the respondents in this study and demonstrated the poorest percentage knowledge on mRDT; scoring below 50% on two of the questions asked as shown in table 5 below.

There is, however, no significant difference in mRDT knowledge among the different professional ranks in the Paediatrics department.

Table 5: Basic Knowledge of malaria rapid diagnostic test among different professional ranks of medical doctors in the Paediatrics department

Question	Professional Rank	Correct Response
Parasite-based examination of the blood is the certain method of confirming malaria infection	Registrar	25 (96.2%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	31 (95.8%)
		Pearson’s Chi-Square = 0.888

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

Parasitological test can be done through microscopy or rapid diagnostic test	Registrar	25 (96.2%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	31 (95.8%)
	Pearson's Chi-Square = 0.888	
MALARIA RAPID DIAGNOSTIC TEST is the quick parasitological test for malaria diagnosis	Registrar	24 (92.3%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	30 (93.8%)
	Pearson's Chi-Square = 0.782	
MALARIA RAPID DIAGNOSTIC TEST is usually specific for one or more species of malaria parasite	Registrar	17 (65.4%)
	Senior Registrar	2 (100%)
	Consultant	3 (75%)
	OVERALL	22 (68.8%)
	Pearson's Chi-Square = 0.784	
MALARIA RAPID DIAGNOSTIC TEST detects Circulating malaria parasite antigen in the blood	Registrar	11 (42.3%)
	Senior Registrar	2 (100%)
	Consultant	2 (50%)
	OVERALL	15 (46.9%)
	Pearson's Chi-Square = 0.719	
MALARIA RAPID DIAGNOSTIC TEST result should be read 15 to 20 minutes after the test	Registrar	9 (34.6%)
	Senior Registrar	2 (100%)
	Consultant	3 (75%)
	OVERALL	14 (43.8%)
	Pearson's Chi-Square = 0.080	
MALARIA RAPID DIAGNOSTIC TEST is superior to microscopy	Registrar	20 (76.9%)
	Senior Registrar	2 (100%)
	Consultant	3 (75%)
	OVERALL	25 (78.1%)
	Pearson's Chi-Square = 0.810	
MALARIA RAPID DIAGNOSTIC TEST is 100% specific	Registrar	21 (80.8%)
	Senior Registrar	2 (100%)
	Consultant	2 (50%)
	OVERALL	25 (78.1%)
	Pearson's Chi-Square = 0.284	
MALARIA RAPID DIAGNOSTIC TEST ought to be done always by a Laboratory Scientist	Registrar	24 (92.3%)
	Senior Registrar	2 (100%)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

	Consultant	4 (100%)
	OVERALL	30 (93.8%)
	Pearson’s Chi-Square = 0.782	
There is only one type of Malaria Rapid Diagnostic Test Kit	Registrar	21 (80.8%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	27 (84.4%)
	Pearson’s Chi-Square = 0.505	

The mean overall percentage knowledge score for medical doctors in the Paediatrics department is 77.9%

Perception of Malaria Rapid Diagnostic Test Across The Three Departments

Of all the different ranks of medical doctors that participated in this study, all Medical Officers had a positive perception on seven of the items assessed, out of eight as shown in table 6 below. All the four Medical Officers believed that; it is important to make a parasite-based confirmation of malaria diagnosis before commencing treatment, mRDT is very useful, mRDT does not endanger the patient by delaying initiation of treatment, presumptive diagnosis of malaria through presenting symptoms is not better, malaria diagnosis is not always clear on listening to the patient, mRDT is not hazardous, and mRDT should be encouraged and promoted. The only item one of them had a negative perception on was that mRDT can reduce the quantity of anti-malaria drugs consumed in a community. All the Medical Officers that participated in the study work in the General Outpatient department and attend to patients every day, thus are probably more exposed to managing malaria cases than the other ranks who usually rotate in different units that provide varied health care services in the hospital.

All the eight Senior Registrars that participated in the study had a positive perception on mRDT not endangering the patient by delaying initiation of treatment, mRDT not being hazardous, the possibility

of mRDT reducing the quantity of anti-malaria drugs consumed in a community, and the need to encourage and promote mRDT. The finding that up to 27% of doctors in this Senior Registrar rank do not believe that it is important to make a parasite-based confirmation of malaria diagnosis before commencing treatment, is a pointer to the possibility of a good number of senior doctors in the hospital not investigating cases of fever prior to initiating treatment.

It is only on the question on mRDT not endangering the life of the patient by delaying initiation of treatment that all the eleven doctors in the Consultant rank reported positive perception. The Consultants are usually saddled with the responsibility of taking final decision on malaria case management, hence it is worrisome that only 54.5% of the participating Consultants had positive perception on the importance of making a parasite-based confirmation of malaria diagnosis before commencing treatment, and up to 27.3% of them do not believe that presumptive diagnosis of malaria through presenting symptoms is not better than parasite-based diagnosis, and also that mRDT is generally useful.

The Registrars are the next in rank to the Senior Registrars in the residency training programme. They recorded above 70% positive perception score on all the

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

items assessed. They, however, might not be in a position to apply these positive perceptions when managing fever cases, since they must comply with instructions handed down by the Senior Registrars and Consultants.

Table 6: Perception of malaria rapid diagnostic test across the three departments

Question	Department	Positive Perception
It is important to make a parasite-based confirmation of malaria diagnosis before commencing treatment	House Officer	2 (18.2%)
	Registrar	38 (73.1%)
	Senior Registrar	5 (63.0%)
	Medical Officer	4 (100.0%)
	Consultant	6 (54.5%)
	OVERALL	55 (64.0%)
MALARIA RAPID DIAGNOSTIC TEST is not very useful	House Officer	9 (81.9%)
	Registrar	50 (96.2%)
	Senior Registrar	7 (87.5%)
	Medical Officer	4 (100.0%)
	Consultant	8 (72.7%)
	OVERALL	78 (90.7%)
MALARIA RAPID DIAGNOSTIC TEST endangers the patient by delaying initiation of treatment	House Officer	11 (100.0%)
	Registrar	49 (94.2%)
	Senior Registrar	8 (100.0%)
	Medical Officer	4 (100.0%)
	Consultant	11 (100.0%)
	OVERALL	83 (96.5%)
Presumptive diagnosis of malaria through presenting symptoms is still better	House Officer	4 (36.4%)
	Registrar	38 (73.1%)
	Senior Registrar	7 (87.5%)
	Medical Officer	4 (100.0%)
	Consultant	8 (72.7%)
	OVERALL	61 (70.9%)
Malaria diagnosis is always clear on listening to the patient	House Officer	7 (63.6%)
	Registrar	39 (75.0%)
	Senior Registrar	6 (75.0%)
	Medical Officer	4 (100.0%)
	Consultant	10 (90.9%)
	OVERALL	66 (76.7%)
MALARIA RAPID DIAGNOSTIC TEST is hazardous	House Officer	11 (100.0%)
	Registrar	45 (86.5%)
	Senior Registrar	8 (100.0%)
	Medical Officer	4 (100.0%)
	Consultant	10 (90.9%)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

	OVERALL	78 (90.7%)
MALARIA RAPID DIAGNOSTIC TEST can reduce the quantity of anti-malaria drugs consumed in a community	House Officer	9 (81.8%)
	Registrar	42 (80.8%)
	Senior Registrar	8 (100.0%)
	Medical Officer	3 (75.0%)
	Consultant	10 (90.9%)
	OVERALL	72 (83.7%)
MALARIA RAPID DIAGNOSTIC TEST should be encouraged and promoted	House Officer	11 (100.0%)
	Registrar	48 (92.3%)
	Senior Registrar	8 (100.0%)
	Medical Officer	4 (100.0%)
	Consultant	10 (90.9%)
	OVERALL	81 (94.2%)

The mean Overall percentage positive perception by medical doctors across the three departments was 83.4%. The highest overall positive perception finding among the ranks of medical doctors across the three departments was documented on mRDT not endangering the patient by delaying initiation of treatment (96.5%). This possibly could be an

indication that the adoption by the hospital management, of the recommended policy of confirming the diagnosis of malaria prior to initiation of treatment, would be acceptable to the doctors whose responsibility it is to manage malaria cases in the hospital. At the time of this research, this policy was not being implemented in the hospital.

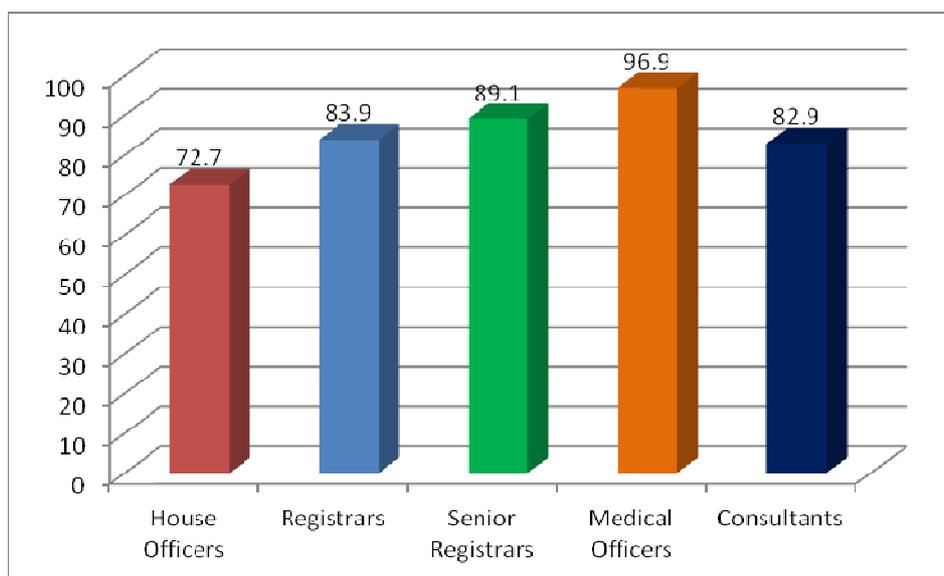


Fig 5: Mean percentage positive perception score for different ranks of medical doctors across the three departments

The Medical Officers had the highest mean percentage positive perception score of 96.9%, followed by the Senior Registrars (89.1%), the Registrars (83.9%), and the

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

Consultants (82.9%). As young medical doctors who were only provisionally registered to practice, the House Officers were not really expected to score better than any of the other ranks of doctors. In line with this thinking, their mean percentage positive perception score was 72.7%, which was the least recorded. Their score on the importance of making a parasite-based diagnosis of malaria was very low (18.2%). They also scored low on a presumptive diagnosis of malaria through presenting symptoms not being better than parasite-based diagnosis (36.4%). All the House Officers that participated in this study were working in the Internal Medicine department.

Perception of Malaria Rapid Diagnostic Test Among Different Professional Ranks Of Medical Doctors In The General Outpatient Department: Out of the twenty-four medical doctors in the General Outpatient department that participated in the study; three were Consultants, four Medical Officers, five Senior Registrars, and twelve Registrars. The General Outpatient department is managed by the Department of Community Medicine, with the Consultants and Resident doctors working

there on a rotational basis, while the Medical Officers work daily. The Medical Officers appear to have exhibited the highest level of percentage positive perception on all the aspects of mRDT perception raised. They all had a positive perception on all these eight aspects of mRDT raised, with the exception of one who had a negative perception on the ability of mRDT to reduce the quantity of anti-malaria drugs consumed in a community. This is an indication that the Medical Officers could favorably be disposed to implementing the *Test, Treat, and Track Initiative* of WHO^[12] if the necessary ingredients for this are provided by the hospital management.

Irrespective of rank, all the doctors working in the General Outpatient department had a positive perception on; mRDT being very useful, mRDT not endangering the patient by delaying initiation of treatment, mRDT not being hazardous, and the need for mRDT to be encouraged and promoted. Only one Senior Registrar out of five had a negative perception on a presumptive diagnosis of malaria through presenting symptoms not being better than confirming diagnosis through the parasite-based test.

Table 7: Perception of MALARIA RAPID DIAGNOSTIC TEST among different professional ranks of medical doctors in the General Outpatient Department

Question	Professional Rank	Positive Perception
It is important to make a parasite-based confirmation of malaria diagnosis before commencing treatment	Registrar	8 (66.7%)
	Senior Registrar	3 (60%)
	Medical Officer	4 (100%)
	Consultant	2 (66.7%)
	OVERALL	17 (70.8%)
MALARIA RAPID DIAGNOSTIC TEST is not very useful	Registrar	12 (100%)
	Senior Registrar	5 (100%)
	Medical Officer	4 (100%)
	Consultant	3 (100%)
	OVERALL	24 (100.0%)
MALARIA RAPID DIAGNOSTIC TEST	Registrar	12 (100%)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

endangers the patient by delaying initiation of treatment	Senior Registrar	5 (100%)
	Medical Officer	4 (100%)
	Consultant	3 (100%)
	OVERALL	24 (100.0%)
Presumptive diagnosis of malaria through presenting symptoms is still better	Registrar	12 (100%)
	Senior Registrar	4 (80%)
	Medical Officer	4 (100%)
	Consultant	3 (100%)
	OVERALL	23 (95.8%)
Malaria diagnosis is always clear on listening to the patient	Registrar	11 (91.7%)
	Senior Registrar	4 (80%)
	Medical Officer	4 (100%)
	Consultant	3 (100%)
	OVERALL	22 (91.7%)
MALARIA RAPID DIAGNOSTIC TEST is hazardous	Registrar	12 (100%)
	Senior Registrar	5 (100%)
	Medical Officer	4 (100%)
	Consultant	3 (100%)
	OVERALL	24 (100.0%)
MALARIA RAPID DIAGNOSTIC TEST can reduce the quantity of anti-malaria drugs consumed in a community	Registrar	11 (91.7%)
	Senior Registrar	5 (100%)
	Medical Officer	3 (75%)
	Consultant	3 (100%)
	OVERALL	22 (91.7%)
MALARIA RAPID DIAGNOSTIC TEST should be encouraged and promoted	Registrar	12 (100%)
	Senior Registrar	5 (100%)
	Medical Officer	4 (100%)
	Consultant	3 (100%)
	OVERALL	24 (100.0%)

The mean overall percentage positive perception among medical doctors in the General Outpatient department is 93.8%. This could be a pointer to the willingness of medical doctors working in the General Outpatient department of the study Teaching Hospital, to implement the recommended practice of confirming the diagnosis of malaria, through the parasite-based test; if

the enabling environment is provided by the hospital management.

Perception of Malaria Rapid Diagnostic Test Among Different Professional Ranks of Medical Doctors In The Internal Medicine Department: As previously stated, all the eleven House Officers that participated in the study work in the Internal Medicine Department, and since they are the

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

lowest rank of medical doctors and only provisionally registered to practice medicine; their poor percentage positive perception on the importance of making a parasite-based diagnosis of malaria (18.2%), and presumptive diagnosis of malaria through presenting symptoms not being better than parasite-based diagnosis (36.4%), was not surprising. In addition to the eleven House Officers; fourteen Registrars, one Senior Registrar, and four Consultants from this department making a total of thirty doctors participated in the study.

The Registrars being the next in rank to House Officers could be said to have recorded impressive positive perception on all eight items on the perception that was investigated as shown in table 8 below; scoring over 70% in seven and 57.1% in the remaining one. Only one Senior Registrar in the department implies that the percentage score could only be "0%" or "100%". This really limits the reliability of inferring any

meaning from findings on the Senior Registrar's rank.

The finding on the Consultants could be said to be worrisome since they are the highest in rank among the medical doctors working in the department. Only one of them in each case had positive perception on the importance of making parasite-based confirmation of malaria diagnosis before commencing treatment, the usefulness of mRDT, and a presumptive diagnosis of malaria through presenting symptoms not being better than parasite-based diagnosis. These findings are somewhat contradictory to their recorded perception on malaria diagnosis not always being clear on listening to the patient (75%), the ability of mRDT to reduce the quantity of anti-malaria drugs consumed in a community (100%), and the need to support and promote mRDT. Further investigating the factors that influenced the perception of these doctors could throw more light into this apparently contradictory finding.

Table 8: Perception of MALARIA RAPID DIAGNOSTIC TEST among different Professional Ranks of medical doctors in the Internal Medicine Department

Question	Professional Rank	Positive Perception
It is important to make a parasite-based confirmation of malaria diagnosis before commencing treatment	House Officer	2 (18.2%)
	Registrar	12 (85.7%)
	Senior Registrar	1 (100%)
	Consultant	1 (25%)
	OVERALL	16 (53.3%)
MALARIA RAPID DIAGNOSTIC TEST is not very useful	House Officer	9 (81.8%)
	Registrar	14 (100%)
	Senior Registrar	0 (0.0%)
	Consultant	1 (25%)
	OVERALL	24 (80.0%)
MALARIA RAPID DIAGNOSTIC TEST endangers the patient by delaying initiation of treatment	House Officer	11 (100%)
	Registrar	13 (92.9%)
	Senior Registrar	1 (100%)
	Consultant	4 (100%)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

	OVERALL	29 (96.7%)
Presumptive diagnosis of malaria through presenting symptoms is still better	House Officer	4 (36.4%)
	Registrar	10 (71.4%)
	Senior Registrar	1 (100%)
	Consultant	1 (25%)
	OVERALL	16 (53.3%)
Malaria diagnosis is always clear on listening to the patient	House Officer	7 (63.6%)
	Registrar	11 (78.6%)
	Senior Registrar	1 (100%)
	Consultant	3 (75%)
	OVERALL	22 (73.3%)
MALARIA RAPID DIAGNOSTIC TEST is hazardous	House Officer	11 (100%)
	Registrar	12 (85.7%)
	Senior Registrar	1 (100%)
	Consultant	3 (75%)
	OVERALL	27 (90.0%)
MALARIA RAPID DIAGNOSTIC TEST can reduce the quantity of anti-malaria drugs consumed in a community	House Officer	9 (81.8%)
	Registrar	8 (57.1%)
	Senior Registrar	1 (100%)
	Consultant	4 (100%)
	OVERALL	22 (73.7%)
MALARIA RAPID DIAGNOSTIC TEST should be encouraged and promoted	House Officer	11 (100%)
	Registrar	11 (78.6%)
	Senior Registrar	1 (100%)
	Consultant	3 (75%)
	OVERALL	26 (86.7%)

The mean overall percentage positive perception among doctors working in the Internal Medicine department is 75.9%.

Perception of Malaria Rapid Diagnostic Test Among Different Professional Ranks of Medical Doctors In The Paediatrics Department: A total of thirty-two doctors comprising twenty-six Registrars, two Senior Registrars, and four Consultants participated in the study. The percentage positive perception scores among all the doctors in this department appear impressive. The Registrars demonstrated the least percentage positive perception score

overall, but recorded positive perception score of over 80% in five of the perception items investigated. The Registrars also scored above 60% in the remaining three perception items studied. The two Senior Registrars had a positive perception on all the eight items investigated, while four Consultants (100%) also had a positive perception on all. One Consultant in each case, however, had a negative perception on the importance of making a parasite-based

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

confirmation of malaria diagnosis before mRDT to reduce the quantity of anti-malaria commencing treatment, and the potential of drugs consumed in a community.

Table 9: Perception of Malaria Rapid Diagnostic test among different professional ranks of medical doctors in the Paediatrics department

Question	Professional Rank	Positive Perception
It is important to make a parasite-based confirmation of malaria diagnosis before commencing treatment	Registrar	17 (65.4%)
	Senior Registrar	2 (100%)
	Consultant	3 (75%)
	OVERALL	22 (68.8%)
MALARIA RAPID DIAGNOSTIC TEST is not very useful	Registrar	24 (92.3%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	30 (93.8%)
MALARIA RAPID DIAGNOSTIC TEST endangers the patient by delaying initiation of treatment	Registrar	24 (92.3%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	30 (93.8%)
Presumptive diagnosis of malaria through presenting symptoms is still better	Registrar	16 (61.5%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	22 (68.8%)
Malaria diagnosis is always clear on listening to the patient	Registrar	16 (61.5%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	22 (68.8%)
MALARIA RAPID DIAGNOSTIC TEST is hazardous	Registrar	21 (80.8%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	27 (84.4%)
MALARIA RAPID DIAGNOSTIC TEST can reduce the quantity of anti-malaria drugs consumed in a community	Registrar	23 (88.5%)
	Senior Registrar	2 (100%)
	Consultant	3 (75%)
	OVERALL	28 (87.5%)
MALARIA RAPID DIAGNOSTIC TEST should be encouraged and promoted	Registrar	25 (96.2%)
	Senior Registrar	2 (100%)
	Consultant	4 (100%)
	OVERALL	31 (96.9%)

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

The mean overall percentage positive perception score among medical doctors working in the Paediatrics department is 82.9%.

Conclusions

Being properly informed on the pattern of knowledge and perception of malaria rapid diagnostic test among the different ranks of medical doctors in a particular health facility is key to developing targeted training plan and curriculum, aimed at improving the practice of confirming the diagnosis of malaria, by conducting a parasite-based blood test, prior to commencing treatment. The mean overall percentage knowledge score of all medical doctors across the three departments was found to be 70.0%; while medical doctors in the General Outpatient department recorded 70.8%, those in the Internal Medicine department 60.3%, and those in the Paediatrics department had 77.9%. Respondents from the Internal Medicine department recorded the least mean score, which was also below the overall mean; hence mRDT training need is more in that department.

On perception, the mean overall percentage positive perception score by medical doctors across the three departments was 83.4%. Those in the General Outpatient department had 93.8%, Internal Medicine department recorded 75.9%, while medical doctors in the Paediatrics department scored 82.9%. Again respondents from the Internal Medicine department had the lowest positive perception score, and together with those in the Paediatrics department recorded scores that were below the mean overall score.

Greater efforts and resources need to be deployed towards creating awareness and training medical doctors involved in fever case management on mRDT. This will enhance their competence in treating malaria infection, by encouraging them to imbibe the practice of confirming the diagnosis of malaria, prior to initiating treatment.

The mean overall percentage score recorded on both knowledge and perception were above 60%. This could be an indication of favorable disposition of medical doctors in this hospital to implement the WHO/Federal government policy of confirming the diagnosis of malaria before initiating treatment if the enabling environment for this is put in place by the management of the hospital.

References

1. World Health Organization. Guidelines for the Treatment of malaria, 3rd Edition. WHO, Geneva, Switzerland, 2015.
2. World Health Organization. World Malaria Report. WHO, Geneva, Switzerland, 2016.
3. Adedotun AA, Morenikeji OA, Odaibo AB. Knowledge, Attitude, and Practices about malaria in an urban community in southwest Nigeria. *Journal of Vector Borne Diseases*, 2010, 47: 155 - 159.
4. National Malaria Control Programme, Nigeria. National Malaria Programme 5 years Strategic Plan 2006 - 2010. Federal Ministry of Health, Abuja Nigeria, 2006.
5. World Health Organization. World Malaria Report. WHO, Geneva, Switzerland, 2009.
6. Amexo M, Tolhurst R, Barnish G, Bates I. Malaria Misdiagnosis: Effects on the Poor and Vulnerable. *Lancet*, 2004, 364: 1896 - 1898.
7. Masanja MI, McMorro M, Kahigwa E, Kachur SP, McElroy PD. Health Workers use of malaria rapid diagnostic test (RDT) to guide clinical decision making in rural dispensaries, Tanzania. *Am J Trop Med Hyg*, 2010, 83: 1238 - 1241.
8. Uzochukwu BSC, Obikeze EN, Onwujekwe OE, Onoka CA, Griffiths

“Pattern of knowledge and perception of malaria rapid diagnostic test among different professional ranks of medical doctors in a State teaching hospital, Southeast Nigeria”

- UK. Cost-Effective analysis of rapid diagnostic test, microscopy and syndromic approach in the diagnosis of malaria in Nigeria: implications for scaling up the deployment of the ACT. *Mal J*, 2009, 8: 265
9. World Health Organization. Guidelines for the Treatment of malaria, 2nd Edition. WHO, Geneva, Switzerland, 2010.
 10. National Malaria and Vector Control Division. National Guidelines for diagnosis and treatment of malaria. Federal Ministry of Health, Abuja, Nigeria, 2011.
 11. Berger BJ. Rapid Diagnostic Tests for malaria: A review. Defence Research and Development, Canada. Technical Memorandum DRDC Suffield TM, 2005 - 2009, 2005
 12. World Health Organization. T3: Test, Treat, Track brochure. WHO, Geneva, Switzerland, 2012.
 13. World Health Organization. Test, Treat, Track: Scaling up diagnostic testing, treatment, and surveillance for malaria. WHO, Geneva, Switzerland, 2012.
 14. Oguonu T, Okafor HU. Comparison of clinical, microscopic and rapid diagnostic test methods in the diagnosis of Plasmodium Falciparum malaria in Enugu, Nigeria. *Niger Postgrad Med J*, 2007, 14(4): 285 - 289.
 15. National Malaria Elimination Programme. National Malaria Strategic Plan 2014 - 2020. Federal Ministry of Health, Abuja, Nigeria, 2014.
-