

Prescribers of Malaria Case Management Practices in Military Health Facilities in the Western Region of Ghana

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Abstract: *This research paper aims to examine prescribers' malaria case management practices in military health facilities in the Western Region of Ghana. In order to eradicate malaria from Ghana, treatment of malaria infection is just as important as prevention. Treatment and prevention go hand in hand, and the neglect of one undermines the other, creating a vicious cycle of malaria infection and reinfection. However, malaria infections should reflect the actual situation on the ground to allow for proper planning because that is the albatross hanging on the neck of Ghana because there is general presumptive malaria management among prescribers. To solve the problem of presumptive treatment among prescribers, Ghana in 2014 adapted the WHO policy of test, treat, and track policy introduced in 2012. However, there are reports of non-compliance by prescribers with this new policy despite training and provision of logistics. The findings revealed a high testing rate (74.69%) of patients suspected of malaria for confirmation of malaria parasites. Patients of all age groups and genders were referred for malaria testing. The high rate of malaria testing across the facility may indicate the availability of malaria rapid diagnosis tests and reagents for microscopy. According to the study, 21.5% of malaria cases were treated presumptively. The study further recommended that there should be supportive supervision on malaria treatments, with regular visits by the armed forces clinical team to assist prescribers. Training should be organized for new prescribers and refresher training for those trained before by way of workshops organized by facility management. The national health insurance scheme should decouple laboratory services from consultation (bundled) services and pay for a malaria test.*

Keywords: *malaria, health facilities, prescribers, diagnosis tests, Western Region*

1. Introduction

Malaria remains endemic in all the six World Health Organization (WHO) regions with the heaviest burden in the African region. It has been reported that about 90% of all malaria deaths globally occurs in the WHO African region where it causes disease in vulnerable groups such as women and children mostly from poor households. The effects of malaria on the health and livelihood of people continue to be devastating though it is preventable and treatable. Malaria continues to receive the recognition as a public health issue of concern. The efforts to eliminate malaria would require a coordinated response, political will, strategic information supported by a robust and effective health system (WHO, 2015). The WHO (2019) report on malaria, estimated about 228 million cases of malaria world-wide in 2018, reflecting a sharp increase in the number of malaria cases recorded in 2017 (219 million) (WHO, 2018). In that same 2018 reporting year, an estimated 405,000 deaths occurred as a result of malaria worldwide, showing a decrease in the number of malaria deaths that occurred in 2017 (WHO, 2018). It was also reported that children aged under five (5) years accounted for 67% (272,000) of the malaria deaths that occurred worldwide in 2018 (WHO, 2019).

The 2019 world malaria report painted a gloomy picture of malaria control and eradication due to the increasing cases; however, the report also brings out the successes of endemic malaria countries and their efforts in controlling malaria, thus bringing Ghana into focus. Ghana recorded about 10.2 million malaria cases in 2017 representing about 34% of out-patient department (OPD) cases compared to 10.4 million cases in 2016. The percentage of malaria cases in the total admission and total death as recorded in 2016 were 19.0% and 2.0% respectively, pointing to the malaria burden in the country. The entire population in the country is at risk of getting malaria with a seasonal variation across the regions,

however vulnerable groups such as pregnant women, children under five years and the immunocompromised persons are the most at risk due to their reduced immunity (National Malaria Control Program (NMCP), 2018).

The malaria burden among pregnant women in Ghana is well documented. The year 2016 saw a significant increase of malaria cases among pregnant women (382,862 cases) as compared to 328,119 cases in 2015. The malaria cases recorded among pregnant women in 2016 represented an increase of 16.7% against the malaria cases among pregnant women in 2015. The top three regions with the highest number of malarias in pregnancy cases in the year 2016 in Ghana were Western region (65,341 cases), followed closely by Ashanti region (52,863 cases) and Eastern region (47,924 cases), pointing to the fact that more work have to be done in the control of malaria in Ghana (Ghana Health Service annual report, 2016) The Ghana demographic and health survey reported that the dominant malaria parasite in Ghana was the *Plasmodium falciparum* in a study conducted in 2014 to determine prevalence of malaria in children aged 6-59 months. It also revealed that Northern region had the highest prevalence of malaria 40% followed by Western region with 39% and the least, being Greater Accra region with 11.2% which indirectly points to the burden of malaria in Ghana across various regions. The practice of neglecting malaria tests and solely relying on patients' symptoms for diagnosing and treatment of and relying solely on patients' symptoms for diagnosing and treating malaria led to over-diagnosis and presumptive treatment of malaria since malaria symptoms overlap with symptoms of other diseases.

2. Materials and Methods

The study was conducted in three military health facilities located in Western region. The Western region is located in the South-Western part of Ghana. It shares borders with Ivory Coast to the West, the central region to the east, parts of Ashanti and Brong Ahafo regions to the north, and the Gulf of Guinea in the south. It covers an area of 23,921 square kilometers representing about 10% of the total land mass of Ghana. The region has twenty-three (23) administrative districts with Sekondi-Takoradi often referred to as the twin city as the administrative capital of the region (Ghana Statistical Service, 2013). There are three main health facilities located within the western region that take care of the health needs of soldier the western region that take care of soldiers health needs in the region and serve as the study area. The three facilities are 2Medical Reception Station, the Western Naval Command Medical Centre (WNCMC) and the Air Force Medical Centre.

A health facility-based descriptive cross-sectional study was carried out in three military health facilities. Hospital records of patients were clinically audited to assess T3 compliance in these facilities. The study was conducted to assess malaria cases treated between January-December 2020 by using a data extraction tool designed for such purpose. In sampling for the study's sample size, a quantitative method of approach was employed, consisting of purposive sampling and simple random sampling. Purposive sampling was used to select the three military health facilities including two (2) polyclinics and one (1) clinic. Number of Prescribers included in the study was determined by the number of Prescribers that were found in the health records of sampled folders. Prescribers were identified by their names or signature, or both that was found in the Patient's health record. The number of Patients' health record that served as the sample size was done by using the consulting room register of each of the facilities that was visited as the sampling frame. Health record numbers and the names of patients suspected of malaria in the consulting room register were picked using simple random sampling due to the small number of malaria cases in the sampling frame until the number of health records needed for that facility was obtained. The names of the Patients were then sent to the records department to confirm their health record identification numbers. With assistance from the record department staff, the patients' health record was then picked from the shelves where they were kept. Folders that did not

meet the criteria were replaced through the same procedure. The Principal Investigator and two assistants carried out the whole sampling procedure.

Three data collection tools were designed to collect data from both primary and secondary data sources. The primary source of data in the study was from a structured questionnaire with Prescribers and Hospital Administrators from each health facility. Data were collected to answer the Prescriber and Health facility factors that influenced compliance to the new malaria treatment guidelines. The secondary source of data that were found in the Patient's health record were extracted using a checklist that was developed to collect data on Patient's demography, whether Patient was suspected of malaria, Patient's principal complains, whether Patient was referred for laboratory testing and results of the test done. Data collected were entered into Epi data. The data were cleaned and checked for completeness and outliers before analysis after which it was entered into STATA version 15. Logistic regression models and -square test for the level of significance were employed to analyze the data to establish a meaningful association between the dependent and independent variables at 0.05 significance level and 95% confidence interval.

3. Results

Malaria Treatment

Malaria treatment aims at full parasite clearance. The use of monotherapy drugs such as chloroquine and stat dose drugs such as sulfadoxine/pyrimethamine in treating malaria has been replaced with artemisinin-based combination therapies where artemisinin compounds serve as the base to a partner drug. The artemisinin ensures rapid clearance of the parasites whilst the partner drug, which has a longer half-life, ensures post-treatment prophylaxis. Oral malaria treatments are recommended to be taken for a period of three days for complete clearance of the parasite.

Chemoprevention has been one of the methods used to prevent malaria, especially in pregnant women. The chemoprevention that is recommended for pregnant women is intermittent preventive therapy with sulfadoxine/pyrimethamine (SP). Children aged between 3-11 months are given Amodiaquine plus sulfadoxine/pyrimethamine (76.5mg Amodiaquine plus 250mg/12.5mg sulfadoxine/pyrimethamine), whilst those aged between 12-59 months are given 153mg Amodiaquine plus 500mg/25mg sulfadoxine/pyrimethamine tablets for four-month seasonal malaria chemoprevention (SMC) to maintain therapeutic antimalarial drug concentration in the blood throughout the period of their greatest risk of being infected by malaria.

There was, therefore the need to find a solution to the problem of presumptive treatment hence the introduction of a new malaria treatment policy by WHO in 2012, which is the T3 strategy: Test, Treat and Track policy in an effort to scale up diagnostic testing, antimalarial treatment and surveillance systems to control malaria infections (WHO, 2012). Presumptive treatment by Prescribers does not reflect the successes chalked in the implementation of malaria preventive programs and portrays the fight against malaria as a losing battle hence the need to adopt the new WHO malaria treatment guidelines. Ghana adapted the global initiative of test, treat and track (T3) policy of WHO and revised its national malaria treatment guidelines in 2014 to reflect the new policy (NMCP, 2014).

Ghana then implemented the new malaria treatment (T3) policy after series of trainings for healthcare workers. However there are still challenges in the implementation due to problems of compliance by Prescribers as reported in a study by Kankpetinge et al.(2018) on clinician's adherence to the T3 policy in the Ho municipality. The study found out that 21.5% of malaria cases were treated presumptively. Additionally, reports from the district health information management system (DHIMS 2) shows a staggering number of presumed malaria cases still being treated without testing in the light of the current treatment guidelines adapted by Ghana as evidenced in Table 1.

Table 1: National Malaria Statistics from 2016-2019

Year	Total number of malaria cases recorded	Confirmed malaria cases	Presumed malaria cases treated	Deaths
2016	10,447,524	4,535,271	2,217,211	1,264
2017	10,211,971	4,893,959	1,300,481	599
2018	11,171,484	5,571,458	951,585	417
2019	12,150,408	6,115,273	708,713	336

Source: District Health Information Management Systems (DHIMS 2)

Table 1. Represents uncomplicated malaria statistics nationally accessed from DHIMS showing malaria data keyed by facilities into the system. The Table depicts how malaria is managed across the country. From table 1. It can be seen that the number of malaria cases in the country has increased with a corresponding increase in testing for malaria. However, the presumed malaria cases being treated are quite alarming though there has been a decrease from such cases from 2017 to 2019. Additionally, deaths as a result of malaria have reduced to 336 in 2019 from an alarming figure of 1,264 in 2016.

Prescribers' alarming number of Presumptive treatments in light of the new malaria treatment guidelines and availability of malaria rapid diagnostic test kits may therefore not be the presumed problem of lack of test kits and microscopy, but other factors that need to be researched into. In an effort to control the burden of malaria, Ghana subscribed to a mix method of preventive and curative measures, which focused mostly on clinical diagnosis. This focus on clinical diagnosis created a phenomenon whereby Prescribers relied on their clinical judgments to treat cases as malaria without a test to confirm malaria, hence leading to over-diagnosis and over-treatment of malaria. Nationwide training on diagnosis and use of malaria rapid diagnostic test kit (mRDT) was organized for Prescribers, Laboratory staff, Nurses, and Pharmacy staff to ensure the policy's success. Additionally, treatment guidelines, malaria treatment charts showing stepwise malaria case management and rapid diagnostic test kit were distributed to all facilities (NMCP, 2016).

Despite the successes reported by this policy, there are reports of low compliance to the policy by Prescribers given rise to presumptive malaria case management in some instances. In 2018 there were about one million presumed malaria cases that were treated across the country with 66,427 (as shown in Table2) coming from Western region alone, painting a picture of the extent to which the problem of presumptive treatment exists in the region

Table 2: Western Regional Malaria Statistics from 2016-2019

Year	Total number of malaria cases recorded	Confirmed malaria cases	Presumed malaria cases treated	Deaths
2016	847,733	409,821	126,897	36
2017	902,439	467,492	94,089	41
2018	994,308	536,190	66,427	22
2019	1,043,835	582,333	64,640	14

Source: District Health Information Management Systems (DHIMS, 2020)

Table 2 shows the malaria statistics of Western region. As evidenced in Table 2, there was an increase in total malaria cases in the region, which is consistent with national figures as shown in Table 1. The problem of presumptive treatment is not just a problem within facilities in the Ghana health service but also that of military health facilities too. Malaria statistics from the 2019 and 2020 annual reports of military health facilities in the western region, as shown in Table 3, shows the extent to which presumptive treatment exists despite training on the new malaria treatment guidelines.

Table 3: Malaria Statistics for western region military health facilities (2019 and 2019)

Year	Total number of malaria cases recorded	Confirmed malaria cases	Presumed malaria cases treated	Deaths
2019	9,188	4,328	3,456	-
2020	7,630	3,812	2,614	-

Source: GAFMS Annual Report (2020)

From Table 3, it can be seen that the three major Military health facilities in the Western region of Ghana recorded 7,630 malaria cases in the year 2020 as against 9,188 in 2019, representing a decrease in malaria cases (GAFMS Annual Report, 2020). It also shows that the number of presumed malaria cases treated reduced from 3,456 (37.61%) in 2019 to 2,614(34.26%) in 2020 indicating an improvement, however the problem of presumptive treatment still persists. Poor compliance to the new malaria policy by Prescribers, despite the efforts made in providing the needed logistics in these facilities could bring about resistance to antimalarial medicines, wastage of resources through over-diagnosis and overtreatment, the financial implication on the patient and the military, and may result in increase in morbidity and mortality in non-malarial febrile cases. Hence, the current study seeks to assess the compliance of prescribers to the test, treat and track malaria policy in military health facilities in the western region.

Prescribers Malaria Case Treatment Practices

The prescriber’s way of managing malaria cases were evaluated the results are as shown in Table 4.

Table 4: Prescribers Malaria Case Treatment Practices

Variables	Frequency (33)	Percentage (%)
Persons send for laboratory malaria testing		
Patient with other underlining diseases		
Yes	19	57.6
No	14	42.4
Patient with Fever		
Yes	28	84.9
No	5	15.1
Age of patient		
Yes	7	21.9
No	25	78.1
Patient with NHIS card		
Yes	5	15.6
No	27	84.4

Entitled		
Yes	13	40.6
No	19	59.4
Non-Entitled		
Yes	15	45.5
No	18	54.5
Patient educational status		
Yes	0	0
No	33	100.0
Type of malaria test prefers using		
Microscopy	9	27.3
Malaria RDT	1	3.0
Both Microscopy and Malaria RDT	23	69.7
Drug use in treating simple malaria in non-pregnant individuals		
ACT only	20	60.6
Artemether injection + ACT	13	39.4
factors considered before prescribing antimalarial medication		
Patient's age		
Yes	25	75.8
No	8	24.2
Entitled		
Yes	9	27.3
No	24	72.7
Non-Entitled		
Yes	6	18.2
No	27	81.8
Possession of NHIS card		
Yes	7	21.2
No	26	78.8
Presence of fever		
Yes	18	54.5
No	15	45.5
Positive malaria test		
Yes	31	93.9
No	2	6.1
Prescribe stat doses of antimalarial injectable for patients with simple malaria		
Yes	17	51.5
No	16	48.5
Factors that influence the dose of anti-malarial you prescribe		
Patient's Weight		
Yes	30	90.9
No	3	9.1
Patient's age		
Yes	24	72.7
No	9	27.3
Standard treatment guidelines		
Yes	11	33.3
No	22	66.7

Cost of antimalarial medicine		
Yes	8	24.2
No	25	75.8
Counsel patient on malaria medication		
Yes	33	100.0
No	0	0.0
Counsel patient on causes of malaria and some preventive methods		
Yes always	33	100.0
No	0	0.0
Ask patients to come back for review		
Yes	29	87.9
No	4	12.1
Number of patients attended to on a shift?		
Less than 25	15	45.5
25 and more	18	54.5
References for malaria case management		
Standard Treatment Guideline		
Yes	33	100.0
No	0	0.0
National Malaria Treatment Policy		
Yes	6	18.2
No	27	81.8
Malaria Case Management Manual		
Yes	1	3.0
No	32	97.0
Trained in malaria case management		
Yes	27	81.8
No	6	18.2

Source: Field Survey, Adorkor (2021)

The results in Table 4 depict prescriber's practices in managing uncomplicated malaria. According to the Table, 57.6% of prescribers (19/33) were likely to send a patient with other underlying diseases for malaria testing, whilst in the case of a patient with fever, 84.9% (28/33) of prescribers responded yes to sending them for malaria test. 21.9% of prescribers (7/33) asserted that they considered age before sending a patient for malaria testing whilst 78.1% (26/33) of prescribers did not consider the patient's age before sending them for malaria test. Careful analysis shows that 15.6% (5/33) of the prescribers considered a patient's NHIS status before requesting a malaria test.

The study also revealed that 40.6% (13/33) of prescribers considered whether the patient was entitled before requesting a malaria test whilst 45.5% also considered whether the patient was non-entitled before requesting a malaria test. All the prescribers 100% (33/33) responded no, to whether they considered the patient's educational background before requesting for malaria test. In terms of preference for the different types of malaria test available, majority (69.7%) of prescribers preferred using both RDT and Microscopy whilst 27.3% (9/33) of the prescribers preferred using microscopy only for malaria testing and 3% (1/33) preferred using the malaria RDT only for malaria testing. It was also revealed that, 60.6% (20/33) of the prescribers preferred using ACT only as the drug of choice for malaria treatment whilst 39.4% (13/33) also preferred a combination of Artemether injection plus ACT in the treatment of uncomplicated malaria.

Still on prescriber's malaria case management, the study probed into the factors considered before prescribing antimalarial medication. It was revealed that most of the prescribers 93.9% (31/33) considered a positive malaria test before prescribing an antimalarial medicine compared to fever (54.5%). It was also shown that 75.8% (25/33) of the prescribers would consider the patient's age before prescribing antimalarial medications as compared to 27.3% of prescribers who considered whether the patient was entitled before prescribing an antimalarial medication however 51.5% (17/33) of prescribers responded yes to prescribing stat doses of antimalarial injection.

The study then took a turn into the factors that influenced the dose of anti-malarial medicine prescribed by the prescribers. The findings from the study pointed out that, 90.9% (30/33) of prescribers considered the patient's weight as a factor that influenced the dose of antimalarial drug whilst 72.7% of prescribers (24/33) responded that, the patient's age influenced the dose of antimalarial drug they prescribed. Standard treatment guidelines and the cost of medication were also revealed to influence the dose of antimalarial medicine prescribed on 33.3% and 24.2% of prescribers respectively.

The study pointed out that, all prescribers 100% (33/33) would counsel the patient on their anti-malaria medication, the causes of malaria and some preventive methods, however only 87.9% of prescribers said they scheduled their patient to come back for a review. Attempts made in knowing their source of reference for malaria case management, the study revealed that all the prescribers (100%) (33/33) use the standard treatment guidelines for managing malaria. The number of prescribers that were trained in malaria case management was found to be 81.8% (27/33).

Prescribers' related characteristics that influenced prescribers' compliance to the new malaria treatment guidelines policy

In assessing the association between the prescriber variables and compliance to the new malaria treatment policy (T3), Pearson's Chi-Square and logistical regression were used to establish meaningful association. The Pearson's Chi-Square test of association reveals that, apart from Prescribers Category that exhibited significant association ($X^2 = 12.3$; $P < 0.01$; 95% CI) with Prescribers' compliance to the T3 policy, the rest of the variables did not exhibit any statistically significant association at $P < 0.05$ as shown in Table 5. The simple logistic regression model also reveals that Nurse Prescribers had 10 times the odd of complying to the malaria treatment policy as compared to Physician Assistants (COR: 25.00, 95%CI: 5.25-502, $P = 0.005$) whereas the multiple regression model reveals that Nurse Prescribers had 6 times the odd of complying to the malaria treatment policy as compared to Physician Assistants (AOR: 12.00, 95%CI: 0.78-213, $P = 0.012$) as shown in Table 5.

Association between patients' characteristics and prescribers' compliance to new malaria treatment guidelines policy

Patients related variables that had an influence on Prescribers compliance were also analyzed to determine meaningful association. It was found from the Pearson's Chi-Square that all the patients' variables showed significant association at $P < 0.05$ as shown in Table 6. Simple logistic regression model also reveals that Prescribers' had 15 times the odd of complying to the malaria treatment guidelines when the patient was not entitled as compared to when the patient was entitled (COR: 37.50, 95%CI 2.77-507, $P = 0.006$) whilst the multiple regression model reveals that Prescribers had 11 times the odd of complying to the malaria treatment guidelines when the patient is not entitled as compared to when the patient is entitled (AOR: 23.00, 95%CI 1.58-356, $P = 0.022$) as shown in Table 6.

Association between health facilities' characteristics and prescribers' compliance to test, treat and track policy

The association between health facility characteristics and prescribers' compliance to the T3 policy was analyzed and the findings are presented in Table 7. The Pearson's Chi-Square test of association reveals that, all the factors had significant association with prescribers' compliance as

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follows; availability of malaria case management manuals ($X^2 = 2.95$; $P < 0.0103$; 95% CI), availability of diagnostic equipment ($X^2 = 2.15$; $P < 0.0293$; 95% CI) and availability of antimalarial medicine ($X^2 = 2.01$; $P < 0.0218$; 95% CI) as shown in Table 7.

Table 5: Prescribers related characteristics that influence prescribers' Compliance to new malaria treatment guidelines protocol/policy.

Variables	Compliance to the T3 policy		Chi-Square	P-Value	COR (95% CI), p-value	AOR (95% CI), p-value
	No (15) n (%)	Yes (18) n (%)				
Age			0.18	0.668	Ref	
<35years	4 (36.4)	8(44.4)				
≥35years	11 (63.6)	10 (55.6)			0.71 (0.15, 3.33), 0.669	
Gender			0.12	0.732	Ref	
Male	12 (72.7)	12 (66.7)				
Female	3 (22.3)	6 (33.3)			1.33 (0.26, 6.94), 0.732	
Years of Practices			3.06	0.217	Ref	
<5	2 (9.09)	7 (38.9)				
5-10	9 (63.6)	8 (44.4)			0.16 (0.02, 1.67), 0.127	
>10	4 (27.3)	3 (16.7)			0.71 (0.00, 1.06), 0.055	
Trained on the new treatment for malaria			1.37	0.242	Ref	
Yes	9 (81.8)	11 (61.1)				
No	2 (18.2)	7 (38.9)			2.86 (0.47, 17.35), 0.252	
Prescriber Category			12.3	0.002*	Ref	
Medical Doctor	5 (45.5)	1 (5.6)				
Physician Assistant	4 (36.4)	2 (11.1)			2.50 (0.16, 38.6), 0.512	2.09 (0.12, 37.19) 0.615
Nurse Prescriber	2 (18.2)	15 (83.3)			25.00 (5.25, 502), 0.005	12.00 (0.78, 213), 0.012
Prescriber's Health Facility Type			1.37	0.242	Ref	
Health Centre	2 (18.2)	7 (38.9)				
Polyclinic	9 (81.8)	11 (61.1)			0.35 (0.06, 2.12), 0.252	

*- statistically significant

Table 6: Association between patients' characteristics and prescribers' compliance to T3 policy

Variables	Compliance to T3 policy		Chi-Square	P-Value	COR (95% CI), p-value	AOR (95% CI), p-value
	No (239) n (%)	Yes (164) n (%)				
Patient Age			0.35	0.048*	Ref	
<5years	41 (17.15)	124 (75.61)				
≥5years	198 (82.85)	40(24.39)			0.61 (0.05, 2.13), 0.642	
Patient Gender			0.62	0.04*	Ref	
Male	134 (56.07)	30(18.29)				
Female	105 (43.93)	134 (81.71)			1.13 (0.06, 5.94), 0.432	
Patient's Temperature			2.37	0.028*		
<37.5	138 (57.74)	39 (23.78)			0.17 (0.03, 1.37), 0.127	
≥37.5	101(42.26)	125 (76.22)				
Patient's weight			1.37	0.022*	Ref.	
<20kg	7 (2.93)	96 (58.54)			0.63 (0.05, 8.2), 0.720	
20-30kg	32 (13.39)	37 (22.56)			1.00 (0.05, 18.91), 1.000	
31-40kg	11 (4.60)	24 (12.24)			0.10 (0.00, 2.50), 0.161	
>40kg	189 (79.08)	7 (4.27)				
Patient NHIS Card Status			12.3	0.002*		
Active	123 (51.46)	65 (39.63)				
Not Active	116 (48.54)	99 (60.37)				
Nature of Patient			6.62	0.010*	Ref.	
Entitled	120 (50.21)	27 (16.46)			2.50 (0.16, 38.6), 0.512	2.09 (0.12, 37.19) 0.615
Not Entitled	119 (49.79)	137 (83.3)			37.50 (2.77, 507), 0.006	23.00 (1.58, 356), 0.022
Patient Educational Level			7.12	0.021*	Ref.	
None	81 (33.89)	26 (15.85)			0.35 (0.06, 2.12), 0.252	
Primary	58 (24.27)	30(18.29)				
Secondary	52 (21.76)	48 (29.27)				
Tertiary	48 (20.08)	60 (36.59)				

*---statistically significant

Table 7: Association between health facilities' characteristics and prescribers' compliance to new malaria treatment guidelines policy

Variables	Compliance to T3 Policy		Chi-Square	P-Value	COR (95% CI), p-value	AOR (95% CI), p-value
	No n (%)	Yes n (%)				
Availability of malaria case management			2.95	0.0103	Ref.	
Standard Treatment Guidelines	0(0.00)	3(100.00)			0.01 (0.10, 3.75), 0.309	0.19 (0.027, 2.13), 0.098
Availability of diagnostic equipment			2.15	0.0293	Ref.	
Yes	2(66.67)	1(33.33)			1.19 (0.91, 7.28), 0.58	1.86 (2.02, 10.35), 1.59
No	1(33.33)	2(66.67)				
Don't know	0(0.00)	0(0.00)				
Availability of antimalarial-			2.01	0.0218	Ref.	
Available	1(33.33)	2 (66.67)			1.72 (1.22, 7.44), 0.530	2.30 (2.80, 14.01), 0.990
Out of stock	2 (66.67)	1(33.33)				
Never been stocked	0(0.00)	0(0.00)				

*---statistically significant

4. Discussion

There is no doubt that for the successful implementation of the new malaria policy, compliance is one of the key factors and therefore brings the work of prescribers to the fore. The prescriber's knowledge of the new malaria treatment guidelines and whether they have been trained in managing malaria cases using the new policy guidelines will help ensure that they comply with them. From the study, it is evident that more than half (60.6%) of the prescribers had been trained and 87.9% of the prescribers had access to the malaria treatment guidelines manual. However, only 9% referred to it whilst 18.2% rarely or never referred to it. This revelation is in direct contrast to what was reported by Harrison et al. (2012) that only 13% of prescribers in an army hospital in Lagos had training in the new malaria treatment guidelines. However, the number of trained prescribers reported by this study did not translate into compliance.

The findings revealed a high testing rate (74.69%) of patients suspected of malaria for confirmation of malaria parasites. Patients of all age groups and genders were referred for malaria testing. The high rate of malaria testing across the facility may indicate the availability of malaria rapid diagnosis tests and reagents for microscopy. Ahmed (2018) reported a similar testing rate of 72.8% in a study in Atebubu-Amantin District (Ahmed, 2018). Even though the findings revealed that there were 140 (46.51%) patients who tested positive and 161 (53.349%) patients who tested negative for malaria, yet 345 (85.6%) were diagnosed with malaria and prescribed antimalarial medicines. The study also found that 25.56% (103) of those tested were negative but received antimalarial treatment, while 25.31% (102) were not tested but received antimalarial treatment, for a total of 50.87% presumptive treatment. However, 14.4% of those tested negative but were not prescribed any malaria medication.

The study also revealed that 99.7% of the treated malaria cases were given the recommended anti-malarial medicine, which is direct contrast to the 47.6% reported by Jimam et al., (2019) in Nigeria. Artemether Lumefantrine was found to be the drug of choice of prescribers as it was prescribed in 99.7% (344/345) of the cases. The prescriber compliance in prescribing the recommended anti-malarial (Artemether/Lumefantrine) may be due to national policy on ACT's and facilities' policy of stocking Artemether/ Lumefantrine as the only oral anti-malarial medicine. It was also found out that 29% (100) of the treated uncomplicated malaria cases were also prescribed Artemether or Artesunate injection in addition to the oral anti-malarial. This phenomenon of prescribing anti-malarial injections may be due to prescribers wanting to achieve a faster malarial parasite clearance before the start of oral medications. It was also explained that some patients requested the antimalarial injection for a faster healing and may be due to economic benefits since these injections were sold to patients. The new malaria treatment guidelines stresses on tracking the patient's treatment progress by way of reviews, which may help to curb resistance to the medication and ensure patient's adherence to the medication. The study findings reveal that out of the 403 malaria cases that were managed by prescribers, only 111 (27.5%) were scheduled for a review of their condition. This low number of people who were scheduled for review may be due to prescriber's workload and also some prescribers deemed it a waste of the patients' time and money. This low number of people who were scheduled for review was however higher than the 15.5% reported by Asiamah D. (2018)

5. Conclusion

The study shows that the level of compliance of Prescribers was poor (15%) and only 49.13% of audited patients' health record managed for malaria complied with the test treat and track policy of malaria management. This phenomenon of prescribing anti-malarial injection may be due to prescribers wanting to achieve a faster malarial parasite clearance before the start of oral medications. The findings revealed a high testing rate (74.69%) of patients suspected of malaria for confirmation of malaria parasites. Patients of all age group and gender were referred for malaria testing. Ghana then implemented the new malaria treatment (T3) policy after series of trainings for healthcare workers. However, there are still challenges in the implementation due to problems of compliance by Prescribers

as reported, clinician's adherence to the T3 policy in the Ho municipality. The study found out that 21.5% of malaria cases were treated presumptively. The study further recommended that; there should be supportive supervision on malaria treatment visits regularly by the armed forces clinical team to assist Prescribers. Training should be organized for new Prescribers and refresher trainings for those trained before by way of workshops organized by facility management. National health insurance scheme should decouple laboratory from consultation (bundled) service and pay for malaria tests.

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7. References

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