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ASSESSMENT OF ADHERENCE TO THE NATIONAL POLICY ON MALARIA TEST, TREAT AND TRACK AMONG PUBLIC AND PRIVATE HEALTH FACILITIES IN ABUJA NIGERIA

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ABSTRACT:
Several challenges relating to the diagnosis and treatment of malaria led to the World Health Organization's (WHO) new initiative of Test, Treat and Track (T3). This study assessed adherence to the National Policy on Malaria T3 by workers in public and private hospitals in Abuja in North central Nigeria. This descriptive comparative cross-sectional study was carried out among 380 health care workers (HCW) selected using multi-stage sampling techniques. Of the 380 HCW, 206 (54.2%) and 174 (45.8%) were from the public and private health facilities respectively. Research instrument used were semi structure, self-administered questionnaire. Data was analyzed using the SPSS software version 17 .0. Sixty eight percent (140/206) of respondents from public facilities were aware of the malaria T3 policy compared to 49.4% (86/174) from the private facilities ($p<0.05$). In addition, 33.0% (68/206) and 29.9% (52/174) of HCW in the public and private health facilities respectively had been trained on the policy. Mean composite knowledge score of T3 policy was 23.8% for public and 27.0% for private health facilities. Using mean adherence scores, 49.4% of public and 45.0% of private facilities had good adherence to the malaria T3; a null hypothesis of no difference in their level of adherence was rejected (p 0.066). Availability of national guidelines (OR 2.2, 95% CI 1.200-4.000, p 0.01) and having been trained (OR 1.5, 95% CI 0.800-2.700, p 0.220) were predictors of adherence on logistic regression. Good awareness, poor knowledge and poor practice of adherence to malaria T3 policy was concluded, with knowledge and practice being more in the public than the private health facilities. The training gap underscores the need for in-depth training of health staff holistic implementation of the malaria T3 policy in Nigeria.

KEY WORDS: Malaria T3 policy, Health care workers, Adherence, Nigeria
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INTRODUCTION

Malaria is a treatable and preventable mosquito borne illness that caused an estimated 655,000 deaths in 2010 mainly among children below 5 years of age in the sub Saharan African region [1]. In 2013, ninety seven countries had ongoing malaria transmission. About 3.3 billion people all over the world are at risk of having malaria. In areas mapped to be at high risk for malaria, more than one malaria cases occur per 1000 population [2]. Nigeria has yet, a long way to go in controlling malaria much more the elimination of malaria. Improving diagnosis and treatment of malaria will not only improve treatment outcomes, but it would also assist in rationalizing health care costs by reducing the consumption of anti-malarial drugs [3]. In addition, it could reduce the menace of drug resistance to anti-malarial medications [4,5]. In 2012, the WHO introduced a new highly ambitious initiative, to span malaria diagnosis, treatment and surveillance. This Test-Treat-Track malaria cases (T3 approach) [1-2] appeared to have given more attention to malaria control compared to previous years.

As the use of microscopy is very limited in most hospitals in sub-Saharan Africa worsened by poor electricity supply and poorly trained malaria microscopists, malaria rapid diagnostic tests (RDTs) are the suggested methods through which the confirmation of malaria diagnosis can be easily achieved. The accuracy, reliability and outcome of treatment based on results of approved RDT kits will therefore move Nigeria beyond the general belief that fever is malaria until proven otherwise. It would also serve as major determinant of adherence of health care workers to the implementation of the new guidelines or approach [4,5].

The trend and level of malaria testing most especially in the public health sector has greatly increased from less than 5% in 2000 to 45% in 2010 according to the World Health Organization (WHO) African Region [2]. "How come Nigeria has not reached the level of proposed global elimination of malaria like some other countries*?"* this is one of the interesting questions that urgently need the attention and focus of researchers. The aim of this study was to assess adherence to the national policy on malaria of Test, Treat and Track by health workers in public and private hospitals in Abuja, Nigeria.

SUBJECTS AND METHODS:

Study area

Abuja is the capital of Nigeria, and it is being administered by the Abuja Municipal Area Council. It has a total population of 2,440 200 according to the estimation in 2015 [6]. The average temperature is 30ºC, humidity of 62%, and wind of NW at 2km/hour and rainfall of 1400mm. Abuja experiences malaria transmission all year-round with peak transmission during the rainy season (March to November). There are six area councils, numerous Primary Health Care centers, five

General Hospitals and two Teaching Hospitals within the FCT.

The national policy on malaria was introduced in the FCT by the Federal Ministry of Health through the National Malaria Elimination Program Department in the 2014 [7]. The implementation package consisted of an on the job training of health workers concerning malaria case management and training on the change of policy through routine supervision and training.

Study design:

A comparative health facility based cross sectional descriptive study

Study populations:

The target population included all health workers in private and public health care facilities in Abuja, while those who took part in the study constituted the study population. Health workers who routinely diagnose and treat malaria in the health facilities and who have spent a minimum of one year at their duty stations were recruited into the study.

Sample Size:

This was determined using the modified Leslie Fishers formular $N= (Z_{\alpha/2} + Z_{\beta})^2[p_1(1-p_1) + p_2(1-p_2)] / (p_1-p_2)$ for calculation of sample size for multiple proportions [8], with p_1 and p_2 being the proportion of public and private health care worker's adherent to the T3 policy for malaria which are 0.5 and 0.4 respectively [9,10]. A calculated sample size of 384 was increased to 400 to adjust for non-response

Sampling Technique

For this study, a multistage sampling technique was employed in selection of study participants. Abuja (under Abuja Municipal Area Council AMAC) is divided into three phases, Phase 1, Phase 2, and Phase 3; there are many districts under a phase. In stage 1, one district each was randomly selected by simple balloting technique from each of the three phases making a total of the three districts- Garki 1 District, City Centre District, and Gwarinpa District. In stage 2, the health care facilities were stratified into public and private by stratified sampling method using ownership of health facility as the stratifying factor. In stage 3, seven private and seven public healthcare facilities were selected by simple random sampling from each of the districts in AMAC. This gave a total of 42 healthcare facilities. In stage 4, all eligible consenting healthcare workers in the selected healthcare facilities on the day of data collection were purposively sampled.

Data Collection Instrument

The research instrument was a questionnaire and this was semi structured ,pretested and self-administered to study participants to obtain information on respondents` socio-demographic characteristics, awareness of T3 policy on malaria, availability of malaria RDTs

(mRDT) and Arthemisin Combination Therapy (ACTs) in the past three months for diagnosis and treatment of malaria, knowledge of malaria diagnosis and treatment, testing before treating, use of ACT in health facilities and factors influencing adherence to the practice of T3 policy on malaria. Face and content validity of the instrument was done by review carried out by a T3 regional malaria programme officer. A psychometrician (expert on questionnaire construction) checked the questions for errors like double barreled confusing and leading questions.

Pre-testing of Instrument

A pilot study was done using 50 questionnaires distributed among health workers in Karu Nasarawa state with similar characteristics as study participants. Corrections were made and the instrument adjusted for the study.

Data Analysis

Data collected from the health workers was entered into the computer and analyzed using the SPSS 17.0 version, after data cleaning and ensuring data validity through random checks and double entry. Tables and charts were used to report descriptive findings. The mean and standard deviation was calculated for numerical data. Univariate analysis was carried out to calculate frequencies and proportions of the different socio demographic and other categorical variables. Bivariate analysis was carried out using Chi-squared test to determine the relationship between the main dependent variable (adherence to the national T3 policy on malaria) and some independent variables such as cadre, type of health facility, number of years of experience of health workers, training, knowledge, and availability of guidelines in the facility. P values of less than or equal to 0.05 was considered statistically significant. A binary logistic regression model was developed to determine the factors associated with adherence to the national T3 policy on malaria.

Data management: Major scoring has to do with knowledge and adherence to T3

Providers' knowledge and attitude on malaria case management: There were questions to assess the health workers knowledge of malaria case management in both private and public health facilities. Some of these questions include whether all fever equates malaria, questions were asked on the meaning of Test, Treat, and Track, whether all suspected malaria cases are tested before treatment and whether ACT was the drug of choice. The source of this data was as reported by the health care worker. Other questions were asked to assess knowledge and each scored maximum of 1 making a total of 5 (Table A). Scores of 0-2 was classified as Poor and scores of 3-5 as Good.

Table A: Questions:	Scores
Meaning of Test, Treat and Track	1
Every fever case is malaria	1
Malaria can easily be tested before treatment	1
Is MRDT used in the absence of fever	1
What is your drug of choice in treatment of malaria	1

Table B: Questions	Scores
Availability of mRDT in the past three months	1
Are all suspected cases referred to the lab for test?	1
Was testing done in the last case of suspected malaria seen?	1
Was result of test seen before commencing ACT?	1
Did you treat only malaria positive test results with ACT?	1
Drug of choice in treatment of last case seen	1
Was any feedback or follow-up done in the last case of malaria?	1
Is there any form of compulsion to treat malaria negative results?	1
Is there routine supervision on malaria?	1

Adherence to national T3 policy on malaria: this was measured by asking the health workers if they do testing for all suspected cases of malaria and results received before commencing antimalarial treatment. Follow up of patients` was also assessed. Other questions are shown in Table B:

There is a maximum of 9 score. Adherence was classified as Poor for scores 0-4 and Good for scores 5-9.

RESULTS:

Table 1 shows no comparable differences between the socio-demographic data of respondents in both types of health facilities. Sixty eight percent (140/206) of public and 49.4% (86/174) of private health facility workers were aware of the malaria T3 policy. In addition, 33.0% (68/206) of the public and 29.9% (52/174) of the private health workers had received training on malaria T3 policy**.** Figure 1 shows resource availability of T3 in public and private facilities. About 51.5%

(130/206) and 30.0% (51/174) of the respondents in the public and private facilities respectively have a copy of the national T3 guideline for the treatment of malaria in their facilities, while mRDT was available in the last 3 months in 81.5% (163/206) and 82.4% (140/174) of public and private health facilities respectively. Table 2 shows that the knowledge of T3 policy on malaria and this is generally poor in both types of facilities; with a good mean knowledge score of 23.8% (49/206) among public and 27.0% (47/174) among the private health facilities. Thus the mean good knowledge score was slightly higher in private than public facilities. In the public healthcare facilities, 49.4% (102/206) of respondents adhered (having good mean adherence score) to the T3 policy on malaria while 45.0% (78/174) of the respondents in private healthcare facilities adhered (having good mean adherence score) to the T3 policy on malaria.

Table 3 shows the mean good T3 knowledge score of respondents in public and private health facilities cross tabulated by selected characteristics. There was statistically significant difference in the mean knowledge score of T3 policy on malaria between public and private health facilities when stratified by training (p 0.001) and sex (p 0.001) as p-value was less than 0.05 in both. There was no significant difference in the mean knowledge score of T3 policy on malaria between public and private health facilities when respondents were stratified by designation and level of care ($p>0.05$).

The result in Table 4 shows statistically significant association between level of care, designation, having been trained and pattern of adherence to the T3 policy ($P<0.05$), while no such association exists between adherence pattern and awareness of the T3 policy, age, sex and types of health facilities ($P>0.05$). There was not enough evidence to accept the Null hypothesis that there was no difference in adherence to the policy on malaria T3 between public and private health facilities (p 0.04).

Table 5 shows that facilities with malaria T3 guidelines available were 2.2 times more likely to adhere to the malaria T3 policy compared to those who did not have adequate guidelines (OR 2.2, 95%CI 1.241-4.015, p 0.01) though this observation was found to be statistically significant. Likewise health facilities with trained respondents 1.5 times more likely to adhere to the malaria T3 policy compared to those who did not (OR 1.5, 95%CI 0.790-2.718, p 0.220) though these observations was found not to be statistically significant.

Table 1: Socio-demographic characteristics by type of facility

	TYPE OF FACILITY	
Characteristics	**Public (%)**	**Private (%)**
Male	72 (35.0)	63 (36.2)
Female	134 (65.0)	111 (63.8)
Age group		
20 – 29	70 (35.0)	56 (32.9)
30 – 39	68 (34.0)	88 (51.8)
40 – 49	42 (21.0)	23 (13.5)
50 – 59	20 (10.0)	3 (1.8)
Mean age (SD): 33.9±7.9 years		
Mean years of Experience: 8.0 ± 7.0		
Designation		
CHEW	94 (45.6)	2 (1.2)
Nurse/Midwife	59 (28.6)	75 (43.1)
Doctor	53 (25.7)	97 (55.8)
Awareness of T3 Malaria Policy		
Yes	140 (68.0)	86 (49.4)
No	66 (32.0)	88 (50.6)
Training on T3 Malaria Policy		
Yes	68 (33.0)	52 (29.9)
No	138 (67.0)	122 (70.1)
Level of care		
Primary	122 (59.2)	-
Secondary	77 (37.4)	141 (81.0)
Tertiary	7 (3.4)	33 (19.0)

Fig. 1: Test Treat and Track Resource availability by type of facility: Bar chart showing T3 malaria resource availability by type of facility

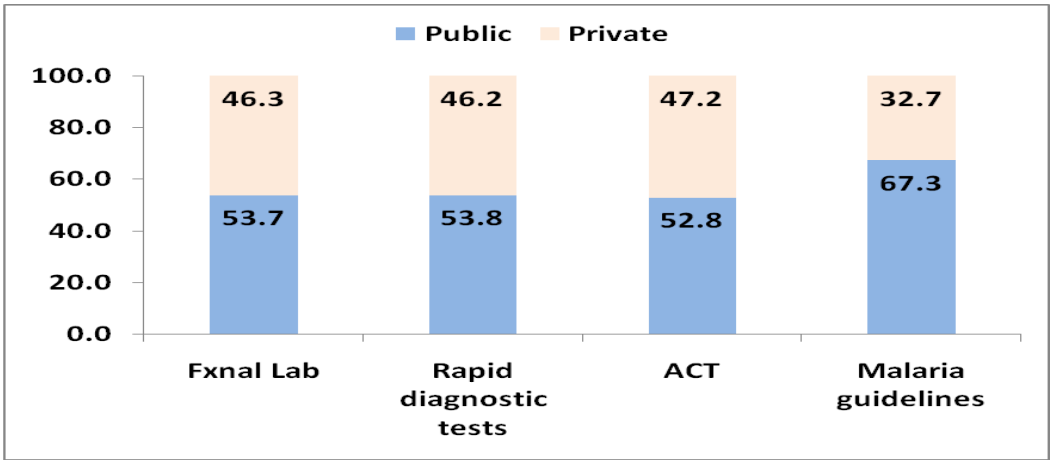

Table 2: Overall mean knowledge and adherence score by type of facilities

	Private		Pubic	
	Good	Poor	Good	Poor
Mean Knowledge scores	27.0	73.0	23.8	76.2
Mean adherence score	45.0	55.0	49.4	50.6

Table 3: Mean good knowledge score of respondents in public and private health facilities by selected characteristics

	Mean Good Knowledge Score		
Characteristics	**Public HF**	**Private HF**	**p-value**
Gender	23.8	27.0	0.36
Male	3.1	3.2	0.46
Female	2.7	3.2	0.00*
Designation			
CHEW	2.7	2.5	0.77
Nurse/Midwife	2.9	3.0	0.55
Doctor	3.2	3.4	0.31
Training on T3 malaria policy			
Yes	3.3	4.0	0.00*
No	2.6	2.8	0.04*
Level of care			
Primary	2.7	-	
Secondary	3.0	3.3	0.10
Tertiary	3.3	2.9	0.35

Table 4: Relationship between selected factors and adherence to test, treat, and track policy on malaria

	Adherence T3			
Characteristics	**Good**	**Poor**	**x2**	**p-value**
Awareness of T3 malaria policy				
Yes	179 (61.5)	50 (56.2)	0.81	0.37
No	112 (38.5)	39 (43.8)		
Training on T3 malaria policy				
Yes	98 (33.9)	21 (24.1)	2.51	0.08
No	191 (66.1)	66 (75.9)		
Level of care				
Primary	106 (36.8)	15 (17.2)	12.6	0.002
Secondary	151 (52.4)	63 (72.4)		
Tertiary	31 (10.8)	9 (10.3)		
Type of facility				
Public	155 (55.0)	43 (50.6)	0.34	0.55
Private	127 (45.0)	42 (49.4)		
Gender				
Male	104 (36.4)	29 (33.3)	0.15	0.7
Female	182 (63.4)	58 (66.7)		
Age (years)				
<34	161 (55.9)	47 (54.0)	0.03	0.9
≥ 34	127 (44.1)	40 (46.0)		
Years of experience				
< 8	186 (64.6)	56 (64.4)	0.01	1
≥ 8	102 (35.4)	31 (35.6)		
Designation				
CHEW	86 (30.0)	9 (10.3)	19.7	<0.001*
Nurse/Midwife	101 (35.2)	30 (34.5)		
Doctor	100 (34.8)	48 (55.2)		

Table 5: Binary logistic regression showing the relationship between selected factors and adherence to the T3 policy on malaria

		95% Confidence Interval		
Factors	**Odds Ratio**	**Lower**	**Upper**	**p-value**
Gender (M/F)	1.1	0.615	1.947	0.78
Years of Experience	1	0.940	1.021	0.33
Guidelines available (Yes/No)	2.2	1.241	4.015	0.01*
mRDT available in last 3 months	1	0.514	2.033	0.95
Type of health facility (Public/Private	0.6	0.355	1.683	0.15
Training (Yes/No)	1.5	0.790	2.718	0.22

DISCUSSION:

This study assessed adherence to the National Policy on Malaria T3 by workers in public and private hospitals in Abuja in North central Nigeria. The T3 policy recommends that every suspected malaria case should be tested, in other words malaria should be diagnosed either by microscopy or malaria RDT before treatment with Arthemisinin Combination Therapy as per in-country guidelines. All cases should however be tracked through timely and accurate reporting and surveillance system in order to forecast trends [1,2].

This study revealed that the public facilities (over two-thirds of the respondents) had a higher level of awareness to the T3 policy on malaria as compared to the private facilities (less than half of the respondents in). This pattern disagrees with a study done in 2016 in Ogun state, Nigeria [11] where awareness was found among almost all respondents in both types of facilities. More doctors having better awareness of T3 compared to other designation of HCWs in the present study was not unexpected, this could be due to the effect of the compulsory and regular continued medical education for doctors to enable them renew their practicing license.

Greater than two third of the respondents in the public (76.2%) and private (73.0%) health facilities have poor mean knowledge of the T3 policy on malaria and this disagrees with other studies [11-13] where over two thirds of the respondents in each study had a good knowledge on the T3 policy on malaria. This may be attributed to the small proportion of the respondents that have been trained on malaria T3. Furthermore, awareness and training were not statistically significant factors associated with adherence to the T3 policy, in consistency with other studies showing that being trained does not necessarily translate into correct diagnostic and treatment practices [14-16].

This poor proportion of trained health care workers in this study agrees with other studies [17-19]. In another study conducted in Kenya, more (a little close to half) of respondents were found to be trained on malaria treatments [19]. This poor proportion of trained health workers in our study should be of concern to the government, other stakeholders and the health care facilities as this will have negative impact on the successful implementation of the T3 policy. The proportion of health workers in this study who have been trained on the T3 policy on malaria was very slightly higher in the public (33.0%) facilities than the private (29.9%) facilities unlike in the study done in Tanzania [20] where training was also poor in both public and private facilities but higher among health workers in the private settings in contrast to our own study.

As awareness may not necessarily translate into good knowledge, good knowledge may as well not guarantee good practice, in this case-adherence [21]. This appears practical in reality

because the health workers in both the public and private facilities may be trained on T3 policy on malaria but they will only work with the materials that are made available to them by their employers most especially in resource poor settings. Evidence from several studies have shown that well trained health care staff could do better in practice most especially in the presence of adequate number and quality of guidelines and job aids [21-23]. This trend however could not explain a finding from our study in which availability to treatment guidelines and the designation have statistical significance to the adherence to the T3 policy among health worker. It is therefore not surprising that those trained were 1.5 times more likely to adhere compared to those not trained on the malaria T3 policy. More than four-fifth of public and private health facilities studied reported regular availability of mRDT, and this finding is in contrast with a study done in Ogun state, Nigeria where only about one fifth of the private facilities had mRDT available and the public facilities had mRDT over four times the amount in the private facilities [11]. This regular availability of commodities is a good indicator to the successful implementation of the malaria T3 policy in Abuja. This may also not be unconnected with previous international collaboration on malaria such as the National malaria elimination program and huge support for malaria programming in the public sector most especially from NGOs and development partners. However, in health facilities where commodities were reported not to be regularly available, health care workers in such facilities could sometimes be constrained to prescribe the anti-malarial drugs available in the facilities even if they are not prescribed in the guidelines. Thus the ability to regularly prescribe the recommended ACT would depend on the finding from this study in which availability of malaria T3 guidelines turned out to be a predictor of adherence, and health care workers in facilities where guidelines were available were 2.2 times more likely to adhere to the T3 policy compared to those without guidelines.

From this study, designation (being a Community Health Extension Worker CHEW), availability of guideline and level of care (Primary health facilities) were significant factors associated with adherence to the T3 policy while gender, number of years of experience, training and availability of mRDT were not. This agrees in part with other studies [11, 23] which showed that malaria training alone was not sufficient to ensure appropriate treatment. Other studies at public and mission facilities elsewhere in Africa have mixed results on prescribing practices of anti-malarial drugs as can be seen in some studies [19,24], though not in some other studies (25, 26). Therefore it can be concluded that respondents in this study had good awareness, poor knowledge but poor practice of adherence to malaria T3 policy. However, good knowledge and practices was higher among private than public

health facility care workers. The training gap underscores a dire need for in-depth training of staff in both public and private health facilities on holistic implementation of the malaria T3 policy in Abuja in North central Nigeria.

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