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CC –BY **Parental satisfaction with quality
of malaria diagnostic service at
University of Benin Teaching
Hospital, Benin City, Edo State**

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Abstract: *Background:* Parents determine where and when to access care for their children. Assessing parental satisfaction with the quality diagnostic services offered for an endemic disease like malaria in a health system is more likely to determine compliance with treatment and future usage of such medical services. This study specifically aimed to assess parental satisfaction with the quality of malaria diagnostic service at the University of Benin Teaching Hospital (UBTH).

Methods: The study is a descriptive survey. A structured questionnaire with a five point Likert scale was used for data collection from parents of children on evaluation for malaria. A mean score of 3.0 and above was used as an acceptable response for high level of satisfaction. The maximal allowable score was 5.

Results: parents of children on

evaluation for malaria (60%) were of the opinion that the clinicians made proper malaria diagnosis and 22.3% felt that a combination of the clinician and laboratory services made the correct diagnosis. While the least properly diagnosed malaria was the pharmacy (1.5%) and self (2.3%) respectively. This study noted that of all the socio demographic variables only mother level of education was found to significantly influenced the level of satisfaction with the quality of malaria diagnostic services offered at CHER in UBTH ($p < 0.05$).

Conclusion: parent satisfaction with the quality of malaria diagnosis by the clinician was high in this study. However, areas with least level of satisfaction such as waiting time and work ethics should be reviewed for improvement to enhance patient believe in the system.

Introduction

Patient's satisfaction is the patient's perception of care received compared with the care expected¹. Evaluating to what extent patients are satisfied with health services is clinically relevant. Satisfied patients are more likely to comply with treatment², take an active role in their own care³, and continue using medical services. They are also more likely to stay with the health care provider (where there are some choices) and maintain a specific system.²The reverse is the case when patients are not satisfied with the health care services.

Malaria is one of the gravest health threats in sub-Saharan Africa.⁴Efforts to control or curtail the spread of malaria infection have posed serious economic challenges to affected countries.

Globally, about 207 million episodes of clinical malaria occurred in 2013,⁵two-thirds of which occurred in sub-Saharan Africa.⁶ Most of the deaths from malaria are among children aged below five years (U-5s).⁶ Nigeria is one of the most malaria endemic countries in Africa. The financial loss due to malaria annually is esti-

mated to be 132 billion Naira, in form of treatment costs, prevention, and loss of man-hours.⁷Direct loss to the economy of the country from malaria is put at GBP (Great Britain Pounds) 530 million. Malaria reduces Nigeria's Gross Domestic Product by one per cent annually.⁷

Correct diagnosis and effective treatment are among the main strategies in the fight against malaria. A diagnosis of malaria based on clinical symptoms alone has very low specificity and contributes to an increase in non-malaria morbidity and mortality. It can also lead to the misuse of anti-malarial drugs, increased costs to the health services and patient dissatisfaction.⁸

The World Health Organization recommends prompt malaria diagnosis either by microscopy or malaria rapid diagnostic test (RDT) in all patients with suspected malaria before treatment is administered.⁹Microscopy remains the mainstay of malaria diagnosis in most large health clinics and hospitals but the quality of microscopy-based diagnosis is frequently inadequate due to lack of expertise. Malaria rapid diagnostic tests (RDTs), which detect malaria parasite antigens in human blood,

permit a reliable detection of malaria infections particularly in remote areas with limited access to quality microscopy services.⁹ Provision of quality malaria diagnostic services in hospital settings entails a process which include proper filling of investigations forms, making payments, collection of blood samples, preparation of slides, reading of blood film, adequate reporting and disclosure of results. This process involves different cadre of staff and can be fraught with lapses which may affect the perception and level of satisfaction of patients and their caregivers. This may in turn impart on the trust of the patients on the health delivery system and compliance with prescribed medications.

Many programmes have been formulated in the past and the world is constantly researching into how best possible (malaria vaccine and other malaria control tools), it is to control and if possible eradicate this public menace. Very little is known about the patients' parent perception and satisfaction with the quality of diagnostic services offered them at the tertiary hospitals. While the health team is working tirelessly to curtail this problem of malaria, very little is known about how the end-user (patients/parent) feels about the whole process of making a diagnosis and their perception about the quality of malaria diagnostic services offered at our hospitals

This study is therefore aimed at assessing the perception and satisfaction among patients' parent on the quality of malaria diagnostic services offered at the children emergency unit (CHER) in UBTH.

Methods

This is a descriptive cross-sectional study carried out between October and November 2016 among parents of patients managed at CHER in UBTH. University of Benin Teaching Hospital (UBTH) is a 700-bed tertiary health care facility situated along the Lagos-Benin expressway in Egor Local Government Area (LGA) in Benin City. It serves as a referral centre for other areas of Edo State as well as the neighboring States of Delta, Kogi, Ondo and parts of Anambra States. About 2400 children are sent for malaria parasite investigation annually in the CHER of UBTH. Mothers who brought their under five children to the Children Emergency Room were consecutively recruited for the study after consent was obtained. The tool for data collection was a close-ended interviewer administered questionnaire which was designed by the researchers and validated. A 5-point Likert scale and the weighted average were used to categorize satisfaction level of the parents in this study.

The questionnaire is composed of three parts; the first segment contains information on the biodata of the respondents including the educational status, father's occupation and income per annum. The second part contains information on the perception of the parent con-

cerning correct diagnosis of malaria while the third segment is on the factors that determined the satisfaction level of the respondents.

Data analysis

The data was analyzed using the SPSS (statistical package for the social sciences) software version 20. Continuous variables were summarized using means while categorical variables were summarized using proportions. The mean Likert scale score or weighted average was used to categorize the satisfaction level as satisfied when the score is \geq the mean score while the value below the mean score was taken as dissatisfied. The mean rating score for each item was calculated by multiplying the number of answers or responses in each category by its rating value (1 to 5), obtaining a sum and dividing by the total number of responses for that item; that is overall rate of satisfaction by Likert scale was calculated as $(\text{No. of excellent rating} \times 5) + (\text{No. of very good rating} \times 4) + (\text{No. of good rating} \times 3) + (\text{No. of fair rating kitem})$.¹⁰ Chi square statistical test of significance was used to test association between categorical variables at a p-value of 0.05 at 95% confidence interval.

Ethical approval was obtained from the Ethics and Research Committee of the University of Benin Teaching Hospital, Benin City. Informed written consent was gotten from the parents of the patients.

Results

Socio-demographic characteristics of respondents.

One hundred and thirty parents comprising of 57 males (44%) and 73 females (56%) were recruited for the study. The mean age of the respondents was 35.81 ± 6.352 years with a range of 24 to 46 years. The respondents were sub-divided into four age groups. Respondents below 30 years were 28 (21.5%), those between ages 30-34 years, were 33 (25.4%), while those between 35-39 years, were 24 (18.5%) those above 40 years were 45 (34.6%). The minimum age of respondents was 24 years while the maximum was 46 years. The mean age was 35.810 with a standard deviation of 6.352.

Majority of the respondents were married 115 (88.46%), single parents were 8 (6.15%) while those that were cohabiting 7 (5.39%) respectively. Most of the respondents had secondary education 70 (53.85%), while 53 (40.77) had tertiary education and 7 (5.39) had primary levels of education respectively. Majority of the respondents 105 (80.77%) earned less than 1 million naira per annum, while 10 (7.70%) earned between 1-1.4 million naira, 13 (10.00%) earned between 1.5-2 million naira and only 3 (2.31%) of the respondents earned above 2 million naira per annum. See Table 1

Table 1: Socio-demographic characteristics of respondents

Characteristic	Frequency	Percentage
<i>Age group (years)*</i>		
<30	28	21.5
30 – 34	33	25.4
35 – 39	24	18.5
40	45	34.6
<i>Gender</i>		
Male	57	44
Female	73	56
<i>Marital status</i>		
Married	115	88.4
Single	8	6.2
Co-habiting	7	5.4
<i>Maternal educational status</i>		
Primary	7	5.4
Secondary	70	53.8
Tertiary	53	40.8
<i>Father's annual income (naira)</i>		
< 1 million	105	80.77
1 – 1.499 million	10	7.70
1.5 – 1.99 million	13	10
2 million	3	2.31

*Mean age (SD) = 35.81 (6.352)

Respondent's perception of the proper diagnosis of malaria

In the table 2 below, most of the respondents had the perception that the diagnosis of malaria in their children was proper done by the doctors 78 (60.0%). Of the other

respondents, 12 (7.7%) believed that the proper diagnosis was made by the medical laboratory services, while 35 (22.3%) were of the opinion that a combined diagnosis by the doctors and medical laboratory was correct. However, 2 (1.5%) believed that the pharmacy services made the proper diagnosis of malaria while 3 (2.3%) were of the opinion that they made the proper diagnosis of malaria in their children respectively. See table 2

Table 2: Respondent's perception of the proper diagnosis of malaria

Perceived to be diagnosed properly by	Frequency	Percentage
Clinician	78	60.0
Lab Technician	12	9.2
Pharmacy	2	1.5
Self	3	2.3
Combined	35	26.9
Total	130	100

Factors associated with Respondents' perception of proper diagnosis of malaria

There is a statistically a significant difference ($p < 0.05$) in gender, mother level of education, age group, waiting time, work ethics factors and the perception of proper diagnosis of malaria by respondents. However, father income and marital status of respondents were not statistically significant ($p > 0.05$) factors that determine respondents perception of proper diagnosis of malaria in their children.

Table 3: Factors associated with Respondents' perception of proper diagnosis of malaria

Factors	Clinician	Lab Tech	Combined	Others	χ^2	p-value
<i>Gender</i>						
Male	37(47.4)	8(66.7)	12(34.3)	0(0.0)	8.150	0.043*
Female	41(52.6)	4(33.3)	23(65.7)	5(100.0)		
<i>Marital Status</i>						
Single	4(5.1)	2(16.7)	2(5.7)	0(0.0)	7.577	0.271
Married	67(85.9)	10(83.3)	33(94.3)	5(100.0)		
Co-Habiting	7(9.0)	0(0.0)	0(0.0)	0(0.0)		
<i>Mothers LOE</i>						
Primary	3(3.8)	2(16.7)	2(5.7)	0(0.0)	14.358	0.073
Secondary	48(61.5)	4(33.3)	13(37.1)	5(100.0)		
Tertiary	27(34.6)	6(50.0)	20(57.1)	0(0.0)		
<i>Income per annum</i>						
<N1m	65(83.3)	10(83.3)	25(71.4)	5(100.0)	9.239	0.416
N1m - N1.4m	6(7.7)	0(0.0)	4(11.4)	0(0.0)		
N1.5m - N2m	7(9.0)	2(16.7)	4(11.4)	0(0.0)		
Above N2m	0(0.0)	0(0.0)	2(5.7)	0(0.0)		
<i>Age group</i>						
Below 30yrs	9(11.5)	6(50.0)	10(28.6)	3(60.0)	19.943	0.018*
30 - 34yrs	19(24.4)	2(16.7)	10(28.6)	2(40.0)		
35 - 39yrs	16(20.5)	2(16.7)	6(17.1)	0(0.0)		
40yrs and above	34(43.6)	2(16.7)	9(25.7)	0(0.0)		
<i>Waiting Time</i>						
30 mins	6(7.7)	2(16.7)	5(14.3)	2(40.0)	14.063	0.029*
30 - 60mins	28(35.9)	4(33.3)	20(57.1)	0(0.0)		
60 mins	44(56.4)	6(50.0)	10(28.6)	3(60.0)		
<i>Work ethics</i>						
Less Concerned	4(5.1)	2(16.7)	5(14.3)	3(60.0)	25.376	<0.0001*
Concerned	40(51.3)	2(16.7)	22(62.9)	2(40.0)		
Very concerned	34(43.6)	8(66.7)	8(22.9)	0(0.0)		

* $p < 0.05$

Respondents' level of satisfaction with quality of malaria diagnostic services

ability of laboratory malaria results; willingness to conduct laboratory investigation; punctuality of service provider and staff language to communicate

The table below shows clearly respondents were satisfied with the ease to access the diagnosis service; avail-

Table 4: Respondents' level of satisfaction with quality of malaria diagnostic services

Respondents' Level Of Satisfaction	1	2	3	4	5	\bar{x}	SD	Remark
Easy to access the service	2	17	53	37	21	3.45	0.96	Positive
Waiting time for lab. Service	3	30	61	26	10	3.08	0.91	Neutral
Health worker professionalism	0	41	40	35	14	3.17	1	Neutral
Encourage to ask any information	16	29	34	33	18	3.06	1.24	Neutral
Availability of lab malaria result	2	23	37	27	41	3.63	1.15	Positive
Willingness to conduct lab invest.	2	10	44	44	30	3.69	0.96	Positive
Punctuality of service providers	0	19	60	33	18	3.38	0.9	Positive
Staff language to communicate	0	35	45	36	14	3.22	0.97	Positive
Explanation about lab.result	2	32	79	17	0	2.85	0.65	Negative
Explanation about malaria drug	13	29	47	19	22	3.06	1.21	Neutral
Grand mean								

n= 130, Mean cut off is 3.0, SD= Standard Deviation. Source: Field survey 2016

Socio-demographic factors associated with respondents' level of satisfaction

There is a statistically significant difference in the mother level of education and the level of satisfaction with the quality of malaria diagnosis. There is no significant difference in other socio demographic factors and the level of satisfaction with the quality of malaria diagnosis

Table 5: Socio demographic factors associated with respondents' level of satisfaction

	Dissatisfied	Satisfied	χ^2	p-value
<i>Age group</i>				
Below 30yrs	13(22.4)	13(19.1)	5.502	0.139
30 - 39yrs	12(20.7)	21(30.9)		
40yrs and above	25(43.1)	18(26.5)		
<i>Gender</i>				
Male	20(34.5)	33(48.5)	2.534	0.111
Female	38(65.5)	35(51.5)		
<i>No of Children</i>				
Below 4	41(70.7)	46(67.6)	0.136	0.713
4 and above	17(29.3)	22(32.4)		
<i>Marital status</i>				
Single	4(6.9)	4(5.9)	0.079	0.961
Married	51(87.9)	60(88.2)		
Co-Habiting	3(5.2)	4(5.9)		
<i>Maternal Educational status</i>				
Primary	2(3.4)	5(7.4)	9.750	0.008*
Secondary	24(41.4)	44(64.7)		
Tertiary	32(55.2)	19(27.9)		
<i>Income per annum</i>				
<N1m	44(75.9)	57(83.8)	6.598	0.086
N1m - N1.499m	8(13.8)	2(2.9)		
N1.5m – N1.99m	6(10.3)	7(10.3)		
N2m	0(0.0)	2(2.9)		

*p = <0.05

Discussion

This study showed that a large percentage of the parents were of the perception that the consulting doctor (60%) made the proper malaria diagnosis of their children. The result from this study is comparable to the 64.7% report in a study done in North Western Ethiopia¹¹The perception that a combination of consulting doctor and the laboratory made a proper diagnosis of malaria of 12.0% reported in the North Western Ethiopia¹¹ is in contrast with the findings in this study of 22.3%. The difference noticed may have been due to the fact that majority of the respondents in this study were literate (may still want to confirm the diagnosis after consultation with their doctor) as compared to the Ethiopian study where a very large percentage of the respondents were illiterate. In this study 7.7% felt that the medical laboratory gave the proper diagnosis of malaria. This is comparable to the 5% reported by Agajieet al¹¹ in a study done in the North Western Ethiopia.

This study reported that 1.5% of respondents were of the opinion that the pharmacy services made a proper diagnosis of malaria. This is comparable to 1.4% reported in the North Western Ethiopia¹¹. However, the report of 2.3% of respondents perception that their (self) shown in this study contrast the 15.3% reported by Agajieet al¹¹; in 2014. The difference noticed may have been due to the fact that majority of the respondents in this study were literate as compared to the Ethiopian study where a very large percentage of the respondents were illiterate.

This study noted that gender, mother level of education, age group, waiting time and work ethics were had statistically significantly influenced respondents perception of malaria diagnosis. These findings are comparable to those observed in Ethiopia¹¹ where work ethics and waiting time positively influenced the perception of malaria diagnosis. But gender and mothers level of education were not among the factors reported to be associated

with perception of proper malaria diagnosis. This may be due to the fact that this study had majority of the respondents been literate as compared to the Ethiopian study that majority (85%) illiterate.

Finally, with regards to the socio demographic factors that influence the level of satisfaction with the quality of malaria diagnostic services surprisingly, only mother level of education was statistically significant in this study. This is in contrast to the Ethiopian work were, work ethics, professionalism and personnel availability were the significant factors that really influence the level of satisfaction with malaria diagnosis. This study may have been different due to the fact that majority of the

respondents were literate and perhaps understand what duty of care is expected of the health service provider to her client.

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