

Patient satisfaction with malaria care among pregnant women and mothers of under 5 children in Ibadan, Southwest Nigeria

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Abstract

Background Patient satisfaction is as an important measure of program assessment and health system performance. In our study, we assessed patient's satisfaction with malaria care among pregnant women (PW) and mothers of children less than five years of age (MU5) in Ibadan, Nigeria.

Methods A cross-sectional design, patient satisfaction with malaria care was assessed among 1,373 participants (818 PW and 555 MU5) with the anti-malarial care they received in a comprehensive hospital in Ibadan, Nigeria. Data on patient satisfaction was obtained using a validated eighteen-item questionnaire (PSQ-18) and analyzed using the standard satisfaction scales and quantitative scores.

Results Overall, more than half of the participants (79.5% of PW and 78.8% MU5) were well satisfied with malaria care. The least satisfaction i.e., 41.4% among PW (mean satisfaction score = 3.06 ± 1.2) and 45.1% (mean 3.16 ± 1.3) among MU5 was reported on the clinical technical quality of (Sometimes doctors make me wonder if their diagnosis is correct). Furthermore, general satisfaction (based on satisfactions with technical quality, inter-personal attitude, communication, cost, accessibility or convenience and time spent with the doctor) was inversely associated with parity of PW (OR for PW with one child = 0.51, 95% CI: 0.34-0.75 with reference to pregnant women who have had more than one child) in multivariate analyses. Among MU5, general satisfaction was associated with extreme poverty (OR = for the poorest = 0.30, 95% CI: 0.10-0.90, with reference to the richest).

Conclusion Socio economic status plays significant roles in mothers' satisfaction with health care access, level of care received and most importantly their prospective health seeking behaviour. Important aspect, such as patient's perception of being well treated by the health care provider should be a key consideration for formulate a patients' centred strategy to improve malaria cares in Oyo state and Nigeria at large.

Background

Despite an unprecedented success in malaria control worldwide, malaria continues to be the leading cause of childhood and maternal mortality in Nigeria. Africa's most populous country, accounted for 27% of malaria cases and 24% of malaria deaths globally in 2016 [1]. According to the recent Nigeria Malaria Indicator Survey (NMIS), the country has demonstrated progress in reducing malaria prevalence among children less than 5 years old, from 42% in 2010 to 27% in 2015 [2]. The national malaria response supports the promotion of insecticide-treated mosquito nets (ITNs), indoor residual spraying (IRS), intermittent preventive treatment for pregnant women (IPT) and prompt diagnosis and treatment [3]. Despite these efforts in controlling malaria, the rate of progress is not uniform across the country. Some of the challenges responsible for the variance and slow-progress in reducing malaria burden to pre-elimination levels and achieving zero malaria-related mortality include weaknesses in the Nigerian health care system [2, 4].

Identifying weaknesses in health care systems using patient-centered approaches is important for improved and strategic health care planning [5]. Over the past years, patient satisfaction surveys have gained increasing attention as meaningful and essential source of information for identifying operational gaps and developing an effective intervention for quality improvement in healthcare delivery [6, 7]. Patient satisfaction refers to the patient's perception of care received compared with the care expected [8]. There are very few published studies on patient satisfaction with malaria care in sub-Saharan Africa, particularly in Nigeria. More studies are needed to inform policy makers on the needs of patients and to influence the development of strategic plans for provision of improved health care services [7]. The Nigerian national malaria policy launched in February 2015 stated the country's aim is to provide cost effective and equitable malaria elimination services while ensuring transparency, accountability and patient satisfaction [9]. The present study set out to evaluate the level of satisfaction with malaria health care services among pregnant women and mothers of children under 5 years of age in Ibadan, South West Nigeria.

Methods

Study design and setting

This cross sectional study was conducted between May and September, 2016 at the Adeoyo maternity hospital, which is the largest secondary maternity hospital in Ibadan, Oyo State, Nigeria [10]. Ibadan is the second most populated city in Nigeria's southwest region with total population of about 2,550,593 based on the 2006 national census [11].

Ibadan is zone one in the distribution of local government areas (LGAs) in Oyo state and it is comprised of 11 LGAs namely; Egbeda, Oluyole, Akinyele, Ona-ara, Lagelu, Ido, Ibadan North East, Ibadan North West, Ibadan South East, Ibadan South West and Ibadan North [12].

Study Population And Sampling

This study population included consenting pregnant women and mothers of children under 5 years old. Women who resided in Ibadan and presented to the antenatal clinic or outpatient children's clinic for care based on self-reported malaria symptoms were eligible to participate in the study. A three-stage sampling technique used in the selection of study participants; first stage included the random selection of Ibadan from the list of local government areas in Oyo state. The second stage involved the random selection of Adeoyo maternity hospital as the study site from lists of maternity hospitals in Ibadan northeast LGA. Lastly, at the third stage, study participants were randomly selected from the study site and enrolled into the study.

Data Collection

Data was collected using a validated eighteen-item patient satisfaction questionnaire (PSQ-18) [13]. Socio demographic information was collected using a modified validated demographic health survey (DHS) questionnaire [14]. Eligible study participants were randomly selected and interviewed by study trained research assistants using both the DHS questionnaire and PSQ-18 after signed informed consents were obtained.

Data analysis

Based on a documented guide for PSQ-18 analyses [13, 15], all items in the PSQ-18 forms were scored using means and standard deviation such that high mean scores reflect higher satisfaction with malaria care. In addition, each item in the PSQ-18 was worded such that; 'Agree or strongly agree' = 'Satisfaction' for Items 1, 2, 3, 5, 6, 8, 11, 16 and 18. Similarly, 'Disagree or strongly disagree' = 'Satisfaction' for Items 4, 7, 9, 10, 12, 13, 14, 16 and 17. Further, seven different scales of satisfaction (dependent variables) were derived from each item in the PSQ-18 as follows: General Satisfaction (Items 3 and 17); Technical Quality (Items 2, 4, 6, and 14); Interpersonal Manner (Items 10 and 11); Communication (Items 1 and 13); Financial Aspects (Items 5 and 7); Time Spent with Doctor (Items 12 and 15); Accessibility and Convenience (Items 8, 9, 16, and 18). The levels of satisfaction for the respective scales were presented both as percentages and as mean ratings (out of five) such that higher means indicate higher satisfaction levels with that scale of satisfaction.

Ordinal logistic regression was used to explore significant predictors of satisfaction from the respondent characteristics (independent variables). A bivariate logistic regression analysis was first conducted for all independent variables, and only those found to be statistically significant using significance level (*P* value) set at < 0.05 were included in the final multivariate ordinal logistic regression analysis. Wealth status that was one of the explanatory variables was computed from availability of household assets and income data collected from the modified DHS questionnaire. Wealth status of the study participants was ranked in percentages and then categorized into wealth quintiles as poorest (0–20%), poor (21–40%), middle (41–60%), rich (61–80%), and richest (81–100%). Data analyses were conducted with the Statistical Package of Social Sciences (SPSS) version-25.

Results

Socio-demographic and clinical characteristics

Mean age of the pregnant women in the study was 29.0 years \pm standard deviation (SD) of 5.2 years. The mean age of mothers of children under 5 years of age was 30.0 \pm 5.2 years. The predominant age group between both maternal groups in the study was women aged 25–34 years of age (69.5% of all participants). Majority of the respondents (60.9%) were within the lower upper socio-economic class. Most respondents (90.8%) were married and living in their matrimonial homes. Slightly above half (51.6%) of the respondents attained secondary education. Almost eighty percent of the respondents have had more than one child (Table 1).

Table 1
Socio-demographic and clinical characteristics of the respondents

Variables	Number (n)	Percentage (%)
Respondents group		
Pregnant women	818	59.6
Mothers of Children Under 5 years of age	555	40.4
Age group (years)		
< 24	207	15.1
25–34	954	69.5
35+	212	15.4
Socio economic status		
Lower class	202	14.8
Lower middle class	219	16.0
Lower upper class	833	60.9
Upper class	115	8.4
Marital status		
Never married	42	3.1
Married	1261	91.8
Separated/Widowed	70	5.1
Education		
No formal education	97	7.1
Primary	81	5.9
Secondary	709	51.6
Tertiary	486	35.4
Religion		
Christianity	567	41.3
Islam	784	57.1
Traditional worshipper	22	1.6
Respondents number of children		
Pregnant with first child	275	20.0
Has more than one child	1098	80.0

Patients' satisfaction with malaria care

Table 2 shows the summary of respondents' satisfaction with malaria care for each item on the eighteen-domain questionnaire. The lowest level of satisfaction (41.4%, mean score 3.06 ± 1.2) among pregnant women was reported on item 4 (Sometimes doctors make me wonder if their diagnosis is correct) and 45.1% (mean 3.16 ± 1.3) among mothers of children under 5 years of age. Highest level of satisfaction 65.2% (mean 4.37 ± 0.7) among pregnant was found for item 1 (doctors/health staff are good at explaining the reason for malaria test/s). However, among mothers of children under 5 years of age, highest level of satisfaction 88.7% (mean 4.39 ± 0.9) was noted for item 18 (I am able to get malaria treatment whenever I need it).

Satisfaction level of the 7 domains derived from the raw scale is presented in Table 3. General satisfaction to malaria care was 79.5% with mean score 3.91 ± 0.5 among pregnant women and 78.8% (mean 3.87 ± 0.5) for mothers of children less than 5 years old. For other measures of satisfaction, pregnant women and mothers reported the following: satisfaction with technical quality 63.2% (mean 3.55 ± 0.3) and 64.6%

(mean 3.57 ± 0.3) respectively; Interpersonal manner, 90.0% (mean 3.91 ± 0.4) and 83.8% (mean 4.02 ± 0.3), respectively; satisfaction to communication, 78.5% (mean 3.89 ± 0.5) and 80% (mean 3.97 ± 0.6), respectively; satisfaction to financial aspect of care, was 72.5% (mean 3.81 ± 0.5) and 71.9% (mean 3.79 ± 0.6), respectively; satisfaction to time spent with doctor, 69.4% (mean 3.72 ± 0.5) and 73.2% (mean 3.82 ± 0.5), respectively; and satisfaction to accessibility and convenience, 68.7% (mean 3.93 ± 0.6) and 78.1% (mean 4.03 ± 0.4), respectively (Table 3).

Table 2
Respondents Satisfaction levels for each of the eighteen items

Questions	Total				
	No (Strongly disagree and disagree) N (%)	Uncertain N (%)	Yes (Strongly agree and agree) N (%)	Mean of responses 1–5	Standard Deviation
Q1 - Doctors/health staff are good at explaining the reason for malaria test/s	96 (9.2)	135 (12.9)	699 (77.9)	4.35	0.71
Q2 - I think the health facility has everything needed to provide complete care	24 (2.7)	49 (5.0)	850 (92.2)	4.24	0.69
Q3 - The malaria intervention I have been receiving is just about perfect	16 (2.0)	65(6.7)	829(91.3)	4.30	0.69
Q4 - Sometimes doctors make me wonder if their diagnosis is correct	382 (43.3)	189 (21.0)	320 (35.8)	3.10	1.25
Q5 - I feel confident that I can get the malaria intervention/s I need without being set back financially	45(5.0)	74 (7.7)	788 (87.3)	4.21	0.83
Q6 - When I go for medical care, they health staff are careful to check everything when treating and examining me	49(5.6)	87(9.3)	776(85.1)	4.18	0.82
Q7 - I have to pay for more of my medical care than I can afford	552(61.4)	109(11.4)	252(27.3)	3.41	1.18
Q8 - I have easy access to the medical specialists I need	82 (9.2)	90 (9.7)	733(81.1)	4.10	0.94
Q9 - When I get care for malaria, people have to wait too long for emergency treatment	469(53.7)	127(14.2)	310(32.1)	3.21	1.24
Q10 - Health staff (Doctors/nurses) act too businesslike and impersonal towards me	53 (59.2)	155 (16.9)	213 (23.9)	3.42	1.15
Q11 - My doctors/nurse treat me in a very friendly and courteous manner	694 (75.7)	89 (10.1)	125 (14.2)	4.01	1.06
Q12 - Those who provide medical care sometimes hurry too much when they treat me for malaria	607 (67.1)	115 (13.4)	183 (19.5)	3.53	1.09
Q13 – Doctors sometimes ignore what I tell them	45 (6.3)	57 (7.3)	790 (86.4)	3.68	0.98
Q14 - I have some doubts about the ability of the doctor who treat me	154 (17.7)	82 (8.9)	657 (73.4)	3.66	1.07
Q15 - Doctors usually spend plenty of time with me	164(18.0)	119(13.0)	624(69)	3.83	1.09
Q16 - I find it hard to get an appointment for medical care	585(66.0)	94(10.4)	201(23.6)	3.54	1.20
Q17 - I am dissatisfied with some things about the malaria treatment I receive	620(69.8)	101(11.2)	169(19.1)	3.62	1.10
Q18 - I am able to get malaria treatment whenever I need it	70(7.6)	57(6.2)	763(86.2)	4.29	0.94
According to the instructions for scoring Patient Satisfaction Questionnaire 18 (PSQ-18) [13]					
(i) 'Agree or strongly agree' = 'Satisfaction' for Items 1, 2, 3, 5, 6, 8, 11, 15 and 18.					
(ii) 'Disagree or strongly disagree' = 'Satisfaction' for Items 4, 7, 9, 10, 12, 13, 14, 16 and 17.					
(iii) For all 18 items, means can range from 1 (strongly dissatisfied) to 5 (strongly satisfied). The results are coded in such a way that, the closer the means are to '5', the higher the satisfaction level for ALL the items.					

Table 3
Seven Scales of Satisfaction Items in Table 2

SN	Satisfaction Scales (component items are shown in brackets)	Pregnant women				Mothers of under-five years children			
		Total means from component items	Means of Satisfaction Scales (average of means deviation from component items)	Standard deviation	% Satisfaction (average of percentages from component items)	Total means from component items	Means of Satisfaction Scales (average of means deviation from component items)	Standard deviation	% Satisfaction (average of percentages from component items)
1	General Satisfaction (Items 3 + 17)	7.81	3.91	0.47	79.5	7.73	3.87	0.54	78.80
2	Technical Quality (Items 2 + 4 + 6 + 14)	14.18	3.55	0.33	63.2	14.26	3.57	0.29	64.55
3	Interpersonal Manner (Items 10 + 11)	7.81	3.91	0.40	89.95	8.04	4.02	0.33	83.80
4	Communication (Items 1 + 13)	7.78	3.89	0.53	78.5	7.93	3.97	0.55	80.00
5	Financial Aspects (Items 5 + 7)	7.61	3.81	0.53	72.45	7.58	3.79	0.55	71.95
6	Time Spent With Doctor (Items 12 + 15)	7.43	3.72	0.52	69.35	7.63	3.82	0.45	73.15
7	Accessibility and Convenience (Items 8 + 9 + 16 + 18)	15.7	3.93	0.59	68.7	16.12	4.03	0.43	78.10

Association of patients' satisfaction with malaria care

Table 4 presents the odds ratios for estimates of the ordinal regression association of potential explanatory factors for satisfaction with malaria care among pregnant women. The determination of general satisfaction with malaria care showed that respondents who were pregnant with their first child were significantly less likely to feel generally satisfied with malaria care offered (OR: 0.51, 95% CI: 0.34–0.75) compared to those who had more than one number of children. Low educational status was associated with higher satisfaction for technical quality of care provided. Pregnant women with primary education were found to have significantly higher odds (OR: 3.50, 95% CI: 1.19–10.28) than those with higher education to be satisfied with technical quality of the malaria care provided. Further, significant association was found for both interpersonal manner and communication with marital status. Married pregnant women had higher odds of being satisfied with the doctor's interpersonal manner (OR: 2.09, 95% CI: 1.03–4.23) and level of communication (OR: 2.26, 95% CI: 1.04–4.91) compared to the never married pregnant women. Respondents currently pregnant with first child were shown to be 48% less likely to be satisfied with the financial aspect of malaria care (OR: 0.52, 95% CI: 0.36–0.76) than women with more than one child. With respect to time spent with doctor, respondents currently pregnant with first child were also shown to be 46% significantly less likely to report satisfaction compared to respondents with more than one child (OR: 0.56, 95% CI: 0.38–0.83). Poorer pregnant women (OR: 2.51; 95% CI: 1.08–5.84) and rich pregnant women (OR: 2.28, 95% CI: 1.12–4.64) had significantly higher odds for satisfaction with accessibility and convenience to malaria care compared to those with richest wealth status.

Table 5 presents ordinal regression results for association of explanatory variables with satisfaction scale for malaria care among mothers of children less than 5 years of age. With respect to general satisfaction scale, mothers of children under 5 years of age with poorest wealth status had much (70%) lower odds (OR: 0.30, 95% CI: 0.10–0.90) of being generally satisfied with malaria care compared to those with richest wealth status. Significant association was also found for respondents' satisfaction with health worker's interpersonal manner and communication. Mothers with secondary education were observed to be 51% less likely to be satisfied with the doctors interpersonal manner (OR: 0.49, 95% CI: 0.29–0.83) compared to those with tertiary education. Also, the poorest mothers of children under 5 years of age were shown to be 80% less

likely to be satisfied with health care workers level of communication (OR: 0.20; 95% CI: 0.07–0.58) compared to those with richest wealth status.

Table 4

Multivariate ordinal logistics regression results for association of explanatory variables with satisfaction scale for malaria care among pregnant women

Satisfaction domain	Factor		OR	95% CI		P-value
				Lower	Upper	
General satisfaction	Marital status	Separated/Widowed	1.41	0.42	4.67	0.577
		Married	1.65	0.80	3.42	0.177
		Never married	1.00			
	Respondents number of children status	Pregnant with one child	0.51	0.34	0.75	0.001
		Has more than one child	1.00			
Technical Quality	Education	No formal education	0.70	0.32	1.50	0.357
		Primary	3.50	1.19	10.28	0.023
		Secondary	1.22	0.83	1.79	0.303
		Tertiary	1.00			
Interpersonal Manner	Marital status	Separated/Widowed	1.54	0.44	5.35	0.498
		Married	2.09	1.03	4.23	0.041
		Never married	1.00			
Communication	Wealth status	Poorest	1.10	0.49	2.47	0.817
		Poorer	2.07	0.89	4.80	0.091
		Rich	1.18	0.58	2.40	0.641
		Richest	1.00			
	Marital status	Separated/Widowed	2.38	0.63	8.93	0.2
		Married	2.26	1.04	4.91	0.039
		Never married	1.00			
	Education	No formal education	1.01	0.45	2.24	0.987
		Primary	1.29	0.45	3.67	0.635
		Secondary	1.43	0.95	2.14	0.086
Tertiary		1.00				
Financial aspect	Wealth status	Poorest	0.98	0.44	2.19	0.969
		Poorer	1.60	0.71	3.62	0.257
		Rich	1.89	0.94	3.82	0.075
		Richest	1.00			
	Education	No formal education	0.88	0.42	1.85	0.743
		Primary	2.30	0.83	6.39	0.109
		Secondary	1.46	0.99	2.16	0.054
		Tertiary	1.00			
	Respondents number of children status	Pregnant with one child	0.52	0.36	0.76	0.001
		Has more than one child	1.00			
Accessibility and convenience	Wealth status	Poorest	1.74	0.77	3.95	0.184
		Poorer	2.51	1.08	5.84	0.033
		Rich	2.28	1.12	4.64	0.023

		Richest	1.00			
	Marital status	Separated/Widowed	2.58	0.71	9.38	0.150
		Married	2.20	1.02	4.75	0.045
		Never married	1.00			
Time spent with doctor	Education	No formal education	0.87	0.41	1.88	0.729
		Primary	3.26	0.99	10.75	0.052
		Secondary	1.06	0.70	1.59	0.786
		Tertiary	1.00			
	Respondents number of children status	Pregnant with one child	0.56	0.38	0.83	0.004
		Has more than one child	1.00			

Table 5
Multivariate ordinal logistics regression results for association of explanatory variables with satisfaction scale for malaria care among mothers of children under 5 years of age

Satisfaction domain	Factor		AOR	95% CI		P-value
				Lower	Upper	
General Satisfaction	Wealth status	Poorest	0.30	0.10	0.90	0.031
		Poorer	0.93	0.37	2.37	0.884
		Rich	1.42	0.65	3.13	0.38
		Richest	1.00			.
Interpersonal Manner	Wealth status	Poorest	0.39	0.13	1.14	0.086
		Poorer	0.90	0.35	2.30	0.823
		Rich	0.83	0.37	1.84	0.64
		Richest	1.00			.
	Marital status	Separated/Widowed	11.05	0.58	208.93	0.109
		Married	3.40	0.79	14.60	0.1
		Never married	1			
	Education	No formal education	1.01	0.23	4.42	0.994
		Primary	0.97	0.37	2.54	0.954
		Secondary	0.49	0.29	0.83	0.008
		Tertiary	1.00			.
	Communication	Wealth status	Poorest	0.20	0.07	0.58
Poorer			0.75	0.30	1.93	0.555
Rich			1.12	0.50	2.49	0.781
Richest			1.00			.
Accessibility and convenience	Marital status	Separated/Widowed	1.22	0.08	18.99	0.889
		Married	1.01	0.27	3.77	0.989
		Never married	1.00			.

Discussion

The current study is the first to use the PSQ-18 tool to evaluate patient satisfaction with malaria care in the Nigeria and Sub-Sahara Africa. Satisfaction of patients with health care has been described as the degree to which a patient's desired expectations, goals and or preferences are met by the health care provider and or service [16]. Some studies [17, 18] have shown that patients are more likely to take appropriate preventive measures and adhere to their treatment plan if they were satisfied with level of care they were offered. The findings from our study showed varying level of satisfaction for some of the items on the PSQ-18 and to each of the seven sub scales of the tool by study respondents. We observed that for each item of the PSQ-18, our study respondents were poorly satisfied with items of the PSQ that reflects on the technical quality of the health care providers. A considerable proportion of this study respondents reported dissatisfaction with the technical aspects of malaria care, as they were unsure of the professional ability of the medical staff to manage them. A similar finding was previously reported by Farley et al in 2014 [19]. Furthermore, in the present study, a little above half of the respondents reported dissatisfaction with waiting for too long before getting medical attention, an observation than has been reported in other parts of Nigeria and therefore suggests a systemic weakness in the national health care provision system [20, 21].

Good satisfaction was reported in the present study for items on the PSQ-18 that relate to level of communication and interpersonal manner by the health care providers as well as accessibility and convenience to health care. Our study findings corroborate with findings from a 2014 evaluation of patient satisfaction with surgical outpatient services in a smaller hospital located in Southern Nigeria [22] where high satisfaction level was found for interpersonal manner of health care providers. Poor satisfaction with financial aspects of surgical outpatient services care was reported in the other study but this is significantly not comparable to our study mainly because wealth status was not measured by the authors in the latter study. Also, our study showed no significant relationship for financial aspects of malaria as a domain for satisfaction with malaria care. We observed that the level of satisfaction among each of the seven scales of satisfaction derived from the 18 items in PSQ ranged from 63.2 to 89.95% vs 64.55 to 83.80% among pregnant women and mothers of children under 5 years of age respectively (Table 3). This is commendable because these proportions are well over average which indicates that good level of satisfaction for all seven patient satisfaction sub scales which include general satisfaction, technical quality, interpersonal manner, communication, financial aspects, time spent with health care provider, and lastly, accessibility and convenience to health care. Similar positive patients satisfaction level was found when compared to other studies which used the PSQ-18 tool and other data collection tool in assessing other health care service in South Eastern Nigeria [23]; other African geographical settings such as North West Ethiopia [24], Tanzania [25], and Egypt [26].

Multivariate analysis to determine association between some socio demographic characteristics and each of the seven scales for patient satisfaction with malaria care showed some significant relationships. First, we observed that pregnant women with average wealth quintile were more satisfied with convenience and accessibility to malaria care than pregnant women in the wealthiest quintile. Income level as a socio economic factor has been shown to influence decision on convenience and accessibility to malaria care [27]. Also observed in our study was that good satisfaction with the clinical technical quality was among pregnant women with low educational status. This provides empirical evidence for the review by Ricci who suggested that low levels of education leads to low knowledge on malaria due to inability to understand written health education materials, such as posters and flyers [28]. Furthermore, we found that the women pregnant with their first child in our study were seen to be less likely generally satisfied with malaria care, financial aspects of care and time spent with doctor. Marital status was associated with satisfaction with the doctor's interpersonal manner and level of communication; greater odds of satisfaction was seen among the married pregnant women. Positive attitude of multiparous mothers compared to first time mothers has been documented to be associated with expectations based on previous experiences with child delivery [29]. Satisfaction from our study supports findings from recent study conducted to assess antenatal care satisfaction in few northern states in Nigeria revealed that financial cost, health care provider behavior and attitude positively influences maternal satisfaction with health care [30]. The latter study aimed to identify the modifiable factors associated with pregnant women's satisfaction with antenatal care ANC at government health facilities in Nigeria. They found an association between patient satisfaction and both the perceived quality of clinical aspects of care and interpersonal interactions of providers. Important clinical care quality factors were: patients trust in their providers' medical decisions, and the number of clinical examinations patients received. Providers' interpersonal interactions of significance were providers' non-discriminatory behavior regardless of patient's socioeconomic status, their concern for patients' wellbeing (empathy), responsive provision of services (respect for patients' time and privacy) and effective communication at consultation (a component of treatment facilitation). In Kenya, satisfaction of pregnant women with the free maternal healthcare services has been documented [31].

Limitations

Although the PSQ-18 that was used to collect data for this study is a valid, reproducible questionnaire [32], potential limitation to this study was response bias. The responses of individuals recruited at a hospital could be influenced by the health condition that brought them to seek health care. Study participants were recruited based on their self-reported malaria symptoms that influenced them to seek health care.

Conclusion

This study found an above average level of satisfaction for each of the seven sub-scales measuring satisfaction with malaria care interventions. Level of satisfaction with malaria was particularly high for the sub scale on health care provider's interpersonal manner and communication. Low satisfaction was observed for the subscale on technical quality of clinical services as perceived by the study respondents. Patient satisfaction can sometimes be very subjective; however, because of the large sample size and methodical approach of the current study, we recommend that health care providers and stake holders take note of the findings herein. Low satisfaction is indicative of unmet health service delivery in the prevention and treatment of malaria. Clinicians and health service providers need to be more attentive and responsive to the expectations of patients seeking for malaria care. The policy implications of findings from this study emphasizes the need for conscientious effort to improve on health care delivery and on women's socio-economic empowerment programs taking into consideration the roles played by mothers in the malaria control and treatment activities.

Abbreviations

ANC- Antenatal care

CI – Confidence Interval

DHS – Demographic health survey

IPT- Intermittent preventive treatment for pregnant women

IRS - indoor residual spraying

ITNs - Insecticide-treated mosquito nets

LGAs - local government areas

MU5 – Mothers of children less than five years

NMIS - Nigeria Malaria Indicator Survey

OR – Odds ratio

PSQ-18 – Patient Satisfaction

PW – Pregnant women

SD - standard deviation

SPSS - Statistical Package of Social Sciences

Declarations

Ethical approval and consent to participate

The study was approved by the Biomedical Research Ethics Committee, KwaZulu-Natal University, South Africa (BREC-BE199/16) and the Oyo State Ministry of Health Ethics Committee, Nigeria (IRB AD13/479/1035). Only human participants were involved in the study. The participants enrolled in the study voluntarily gave informed consent to participate after gaining an understanding of the purpose and procedure of the study.

Consent to publish

Not applicable

Availability of data and materials

The dataset produced by the current study is available from the corresponding author upon request

Competing interest

The authors, including Prof. Sanni Yaya, an Associate Editor of the BMC Public Health Journal, declare no competing interests.

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Authors' contributions

KEO conceptualized the study, reviewed the literature, wrote the first draft of the manuscript with the data analysis plan. KEO, JJN, SNC, AMA analysed the data, KEO, JMTG, FLMH, SY, DTG critically reviewed the manuscript for its intellectual content. All authors read and approved the final manuscript. KEO had final responsibility to submit the manuscript

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