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A cross-sectional survey of parental care-seeking behavior for febrile illness among under-five children in Nigeria

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KEYWORDS

Fever;
Child;
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Abstract *Background:* Infections are a common cause of childhood morbidity and mortality in developing countries. Proper management of these conditions in appropriate health facilities provides the best opportunity for survival and reducing disability.
Aims: To evaluate the care-seeking behavior by parents of under-five children with fever in Nigeria and determine household characteristics associated with appropriate care-seeking.
Material and methods: The study is a secondary analysis of 2013 Demographic and Health Survey data for Nigeria, which was a cross-sectional survey conducted nationwide to obtain demographic and health characteristics of the population among 40,680 households selected using a multistage cluster sampling method. Under-five children with fever in the preceding two weeks were selected alongside their mothers. Selected sociodemographic parameters were related to parents seeking care from appropriate health facilities or otherwise. Logistic regression analysis was employed to evaluate the association of these parameters with appropriate care-seeking.
Results: There were 3632 (12.6%) under-five children with fever in the preceding two weeks. Of these, 1142 (31.4%) had been taken to an appropriate health facility for care. Factors associated with appropriate care-seeking were paternal secondary (OR, 95% CI; 1.49, 1.16–1.90), paternal tertiary education (OR, 95% CI; 2.03, 1.49–2.76) and belonging to the Muslim faith (OR, 95% CI; 2.31, 1.86–2.87). Others were age of child < 36 months, being married and working mother.
Conclusion: There is poor care-seeking for fever in under-five children by parents in Nigeria. Improved literacy, women empowerment and health education are strategies that may improve care-seeking behavior. Highlighted regional differences are additional considerations for such interventions.

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1. Introduction

Fever represents a perception of an elevated body temperature and is often considered by parents as a disease rather than a symptom or sign of disease.[1] It is a common symptom/sign in children and accounts for about 61% of visits by children to a pediatric outpatient clinic in Nigeria.[2] Most cases of fever in developing countries, such as Nigeria, result from infectious diseases, such as malaria, septicemia, respiratory and urinary tract infections, among others.[3] The burden of these infectious diseases makes it crucial for children having a fever to have proper evaluation by a healthcare practitioner. Several community and facility based interventions, such as malaria rapid diagnostic testing and use of artemisinin based combination therapies, designed for early diagnosis and appropriate management of these disorders often go under-utilized as parents fail to avail themselves of their use.[4]

Pneumonia, malaria, diarrheal disease, sepsis and other infections accounted for 64.0% (4.9 million) of the 7.6 million deaths of children under five years of age that occurred globally in 2010, with majority of these deaths occurring in developing countries.[5] In Nigeria, these conditions accounted for about 57% of all under-five mortality in 2013.[6] Most of these conditions will present with fever early on in the illness. Thus, early diagnosis and treatment are cardinal aspects of the global strategies for reducing the burden of malaria and pneumonia morbidity and mortality rest crucially on parents recognizing fever early and taking the right decisions for the child to have a near optimal opportunity for treatment and survival.[6,7] Sick children need to get efficacious and appropriate drugs in time. The Roll Back Malaria program set ambitious targets of at least 80% of those suffering from malaria having easy access to appropriate and affordable treatment within 24 h of the onset of symptoms by 2013.[8] Similarly, the global action plan for the prevention and control of pneumonia set targets to achieve 90% access to appropriate pneumonia case management by 2015.[9] Developing effective strategies to improve care-seeking behavior by parents in Nigeria will require a careful examination of those factors that are associated with appropriate care seeking and otherwise. Unfortunately, few studies have examined these on a national scale in relation to febrile illness and as such, there are fundamental gaps in our understanding of the role of sociodemographic and household characteristics in determining appropriate care-seeking. One of such nationwide studies is the 2011 Nigeria multiple indicator cluster survey.[10] The survey explored treatment, such as antimalarials given to febrile children nationwide, but failed to determine whether the treatment was based on seeking care from an appropriate facility.[10] Similarly, the 2010 Nigeria malaria indicator survey reported 35.4% of the 5519 under five children surveyed had fever in the preceding two weeks and 49.1% of them received an antimalarial drug but did not report on their care seeking behavior.[4] On the other hand, several local studies from different parts of Nigeria have reported varying findings as to determinants of care seeking behavior.[11–13] Abdulkadir et al. in North-Central Nigeria reported high social class and ethnic group were significant predictors of parents seeking care early for their febrile children.[11] Interestingly, they found that mothers with secondary school education were less likely to have appropriate care seeking behavior.[11] Onwujekwe et al. in South East Nigeria demonstrated that in one community the most poor were likely to seek medical care early while in another the least poor had the least delay in seeking for medical care for their children suspected to have malaria.[12] Other demographic characteristics, such as religion and household size were either not examined or not significant.[11–13] Extrapolating the findings of these local studies to a National scale is not feasible considering the major differences in terms of culture, education, religion, among others across the country. Thus, knowledge gap exists on the major cross-cultural determinants of care-seeking behavior and how factors such as education, religion, family size, socioeconomic status, among others relate to parents seeking care for their febrile under-five children. Such knowledge may provide insight into how targeted education and other social interventions may provide the critical ingredients that will improve parental use of medical services and appropriate decision making for childhood illnesses.

Thus, the study seeks to ascertain the proportion of febrile under-five children who receive appropriate care in Nigeria and the role of child and household characteristics in determining appropriate care-seeking behavior for febrile under-five children.

2. Materials and methods

2.1. Study design

The study utilizes the dataset of the 2013 Nigeria Demographic and Health Survey (NDHS), conducted by the National Population Commission which is available for use to researchers. Written approval was obtained for use of the data from DHS program and ICF International after submitting a brief proposal on the topic. A detailed description of the study design, participants and study instruments has been previously published by National Population Commission.[14] The study received ethical approval from the National Health Research Ethics Committee. Written informed consent was a stringent prerequisite for every participating respondent and was obtained. The survey was conducted nationwide using a stratified three-stage cluster design.[14] In the first stage, 893 localities were selected across the country using probability sampling with probability of selection being proportional to size. Enumeration areas with clear geographical boundaries were delineated across the country (defined from population census in 2006) and at least one enumeration area was selected randomly from each of the 893 localities resulting in 904 enumeration areas. In a few of the larger localities more than one enumeration area was selected.[14] A listing of households in each selected enumeration area was made and 45 households were selected using systematic probability sampling with the sampling frame being the list of households in each enumeration area.[14] This resulted in selection of 40,680 households that were surveyed for the demographic and health survey. A standard demographic and health survey questionnaire developed by the DHS program with some country adaptation was administered to members of the household, including mothers.[15] Questionnaires covered a wide range of topics including household characteristics, health of children and care-seeking behavior, among others.[14,15]

2.2. Inclusion criteria/definition of terms

Children aged 0–59 months that had fever in the two week period before the survey were included in the analysis along with their parents. Appropriate care-seeking was defined as seeking care from all public or private hospitals, health centers or posts, private doctors and community health workers and excludes no medical care, pharmacies, shops and traditional practitioners.[16,17]

2.3. Data analyses

Data analyses were performed using SPSS version 20 software package. Weights built into the database to account for bias in sampling within some enumeration areas were utilized in the final analysis as recommended by the DHS program.[18] Sampling weights are correction factors utilized in tabulations to adjust for differences in probability of selection and interview between cases in a sample, due to either design or happenstance.[18,19] To eliminate this potential sampling bias, sampling weights are provided that must be multiplied by the recorded frequency of events to provide the real number of individuals that would have been selected if bias in sampling was not present.[18] Weighted data were used for generation of frequencies, proportions, mean, median and the univariate analyses. Unweighted data were used for the regression analyses. Weighting data for regression analyses often introduce heteroskedasticity and increase the standard error of the variables, especially when weighting was performed on independent variables as in DHS data.[18,19] Thus, most reviews recommend the use of unweighted data for regression analyses as they provide a more accurate and true measure of effect without being distorted by the change in distribution imposed by sample selection bias.[18,19] Socioeconomic status of the respondents was determined using the quintiles generated for the wealth index by methods as described by Rutstein and Johnson.[20] Frequency distribution tables and cross-tabulation of variables were generated. Mean and standard deviation for quantitative variables and proportion for qualitative variables were provided. Basic tests of statistical significance such as chi-square and Student's *t*-tests were utilized. Maternal, household, socioeconomic, education and child factors were compared individually to care-seeking categories in a univariate analysis. Factors that were significant ($p \leqslant 0.05$) on a univariate analysis were built into a binary logistic regression model that was used to identify significant predictors of appropriate care-seeking behavior. Unweighted data were used for the regression analysis as recommended by the demographic and health survey program.[18] Odds ratio and *p*-value were used to determine significance of associations. A *p-value* of $\leqslant 0.05$ was considered significant.

3. Results

Among the 40,680 households, there were 28,950 children under five years of age. The mean (SD) age of the children was 28.14 (17.33) with a range of 0–59 months and median (25th–75th percentiles) of 27 (13–43) months. There were 14,509 males (50.1%) and 14,440 females (49.9%).

Of the 28,950 under-five children, there were valid responses on presence of fever in the last two weeks for 28,776 children (99.4% response rate). There were 3632 (12.6%) under-five children who had fever within the two week period before the survey. Of this number, there were 1867 (51.4%) males and 1765 females (48.6%). The mean (SD) age of the children with fever was 26.16 (15.86) months with a range of 0–59 months and median (25th–75th percentiles) of 24.0 (13–39) months. The commonest age group affected was between the ages of 12 and 23 months with 1028 (28.7%) children having fever. Others are as in Table 1.

Among the 3632 under-five children with fever, 1142 (31.4%) parents sought for care at an appropriate site. The mean age of children with fever who had been taken to appropriate care sites was significantly lower than that of those who had been taken to inappropriate sites for care ($p = 0.015$) (Table 1). Among parents who sought for appropriate care, 50.0% of the fathers had secondary school education or more as against 37.4% of those who sought for inappropriate care ($p = 0.001$) (Table 1). Current marital status, maternal educational status, total duration of maternal education, maternal age, age of the child, religion, wealth index, having health insurance, geopolitical region of residence, place of residence and current working status of mother were significantly associated with appropriate care-seeking practice during recent febrile illness on univariate analyses (all $p < 0.05$) (Table 1). The variables listed above were put into a binomial regression model. The model was significant and predicted 68.8% of care-seeking behavior with a specificity of 92.0% and sensitivity of 22.0%. Age of child less than 36 months increased the odds of seeking appropriate care (Table 2). The infant had a 1.5 greater chance of being taken to a health facility when having fever compared to the child aged 48–59 months (95% CI 1.14–1.96) (Table 2). Secondary and tertiary level paternal education were associated with a 1.5 (95% CI 1.16–1.90) and 2.0 (95% CI 1.49–2.76) fold increase in the chances of seeking appropriate care respectively. Similarly, a mother belonging to the Islamic faith was associated with a 1.5-fold increase in the odds of seeking appropriate care (95% CI 1.18–2.01) (Table 2). Factors that were significantly associated with decreased likelihood of seeking appropriate care were being married and residence in the North-East, South-East and South-South regions (Table 2).

4. Discussion

The study sought to determine those household level characteristics that influence decision making on care-seeking for febrile under-five children. While several studies on care-seeking behavior of Nigerian parents for childhood illness exist, few have examined truly nationwide data. The 2013 Demographic and Health Survey provided such a nationwide data, providing an opportunity to examine how family characteristics influence care-seeking.[14]

Care-seeking for fever in under-five children was poor throughout the country with only 31% of parents seeking for care from health facilities. This is far lower than the set targets of the national malaria program of 80% by 2013.[9] A similar study in Malawi reported only 28% of parents seeking for care from health facilities.[21] Another older study in Ilorin of under-five children with fever seen in a tertiary hospital reported that 57% of parents had sought for competent care for their febrile children within 24 h of onset.[11] Traditional practitioners, chemists, drug vendors and other inappropriate

Table 1 Weighted frequencies and percentages of determinants of appropriate care-seeking behavior.

Variables	Appropriate[a]	Inappropriate[a]	*p* Value[*]
Age of child, months mean (SD)	25.11 (15.41)	26.63 (16.03)	**0.008**
Age of mother, years mean (SD)	29.73 (6.98)	29.13 (7.04)	**0.019**
Age of husband/partner, years mean (SD)	39.58 (9.56)	39.31 (9.89)	0.446
Number of children under five in household	2.18 (1.23)	2.26 (1.18)	0.052
Age grouping of children, months	*n* = 1143 (%)	*n* = 2310 (%)	
0–11	265 (23.2)	462 (20.0)	**0.045**
12–23	328 (28.7)	655 (28.4)	
24–35	231 (20.2)	463 (20.0)	
36–47	184 (16.1)	381 (16.5)	
48–59	135 (11.8)	349 (15.1)	
Sex of child	*n* = 1142 (%)	*n* = 2310 (%)	0.542
Male	593 (51.9)	1174 (50.7)	
Female	549 (48.1)	1136 (49.3)	
Place of residence	*n* = 1143 (%)	*n* = 2309 (%)	**0.001**
Urban	461 (40.3)	758 (32.8)	
Rural	682 (59.7)	1551 (67.2)	
Highest maternal educational level	*n* = 1143 (%)	*n* = 2310 (%)	**0.001**
None	479 (41.9)	1140 (49.4)	
Primary	209 (18.3)	472 (20.4)	
Secondary	336 (29.4)	608 (26.3)	
Tertiary	119 (10.4)	90 (3.9)	
Mean (SD) duration of mother education (years)	5.66 (5.65)	4.41 (5.05)	**0.001**
Mother's religion	*n* = 1137 (%)	*n* = 2284 (%)	**0.005**
Christianity	410 (36.1)	955 (41.8)	
Islam	719 (63.2)	1311 (57.4)	
Traditionalist	8 (0.7)	18 (0.8)	
Highest paternal educational level	*n* = 1106 (%)	*n* = 2216 (%)	**0.001**
None	359 (32.5)	929 (41.9)	
Primary	194 (17.6)	460 (20.8)	
Secondary	332 (30.0)	636 (28.7)	
Tertiary	221 (20.0)	191 (8.6)	
Wealth index	*n* = 1144(%)	*n* = 2310(%)	**0.001**
Poorest	227 (19.8)	618 (26.8)	
Poorer	244 (21.3)	548 (23.7)	
Middle	227 (19.8)	493 (21.3)	
Richer	216 (18.9)	371 (16.1)	
Richest	230 (20.1)	280 (12.1)	
Mother currently working	*n* = 1139 (%)	*n* = 2304 (%)	**0.001**
Yes	817 (71.7)	1487 (64.5)	
No	322 (28.3)	817 (35.5)	
Covered by health insurance	*n* = 1138 (%)	*n* = 2302 (%)	0.057
Yes	24 (2.1)	29 (1.3)	
No	1114 (97.9)	2273 (98.7)	
Decision maker regarding health of mother	*n* = 1077 (%)	*n* = 2151 (%)	0.244
Mother alone	70 (6.4)	147 (6.8)	
Mother and husband/partner	351 (32.0)	640 (29.8)	
Husband/partner alone	672 (61.3)	1362 (63.3)	
Others	4 (0.4)	2 (0.1)	
Current marital status	*n* = 1123 (%)	*n* = 2310 (%)	**0.001**
Never married	15 (1.3)	59 (2.5)	
Married	1080 (94.5)	2076 (89.9)	
Living with partner	18 (1.6)	85 (3.7)	
Widowed/separated/divorced	30 (2.6)	90 (3.9)	
Geopolitical region of residence	*n* = 1178(%)	*n* = 2338(%)	0.001
North-Central	127 (10.8)	161 (6.9)	
North-East	347 (29.5)	856 (36.6)	

Table 1 (*continued*)

Variables	Appropriate[a]	Inappropriate[a]	*p* Value[*]
North-West	312 (26.5)	512 (21.9)	
South-East	133 (11.3)	351 (15.0)	
South-South	128 (10.9)	335 (14.3)	
South-West	131 (11.1)	123 (5.3)	

[a] Weighted data to account for probability of selection. May not add up to total numbers seeking appropriate or inappropriate care because of non-response.
[*] Statistically significant values are bolded.

Table 2 Determinants of appropriate care-seeking for children with fever (unweighted data).

Variable	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	*p*-Value[*]
Age group of child, months			
0–11	1.44 (1.12–1.85)	**1.49 (1.14–1.96)**	**0.004**
12–23	1.31(1.03–1.67)	**1.30 (1.01–1.68)**	**0.047**
24–35	1.40 (1.05–1.75)	**1.36 (1.04–1.78)**	**0.027**
36–47	1.22 (0.93–1.59)	1.25 (0.94–1.65)	0.129
48–59	1.00	1.00	
Mean age (SD) of mother, years	1.00 (1.00–1.02)	1.01 (1.00–1.02)	0.051
Mean (SD) duration of education, years	1.06 (1.04–1.07)	1.05 (0.98–1.12)	0.210
Place of residence			
Urban	1.00	1.00	
Rural	0.67 (0.58–0.78)	1.05 (0.86–1.29)	0.623
Religion			
Christianity	1.00	1.00	
Islam	1.14 (0.99–1.32)	**1.54 (1.18–2.01)**	**0.002**
Traditionalist	0.91 (0.42–2.01)	1.34 (0.58–3.06)	0.493
Highest maternal educational level			
None	1.00	1.00	
Primary	1.20 (0.99–1.45)	1.05 (0.69–1.59)	0.817
Secondary	1.52 (1.28–1.80)	1.09 (0.51–2.35)	0.820
Tertiary	3.64 (2.68–4.92)	1.55 (0.52–4.61)	0.427
Highest paternal educational level			
None	1.00	1.00	
Primary	1.16 (0.95–1.42)	1.26 (0.99–1.60)	0.063
Secondary	1.59 (1.33–1.90)	**1.49 (1.16–1.90)**	**0.002**
Tertiary	3.08 (2.46–3.86)	**2.03 (1.49–2.76)**	**0.001**
Household wealth index quintiles			
Poorest	1.00	1.00	
Poorer	1.31 (1.06–1.62)	1.18 (0.94–1.47)	0.164
Middle	1.59 (1.28–1.97)	**1.32 (1.02–1.71)**	**0.038**
Richer	1.92 (1.53–2.40)	1.32 (0.96–1.81)	0.083
Richest	2.70 (2.11–3.45)	1.26 (0.85–1.87)	0.249
Marital status			
Not married	1.00	1.00	
Married	1.74 (1.05–2.90)	**1.54 (1.21–1.84)**	**0.004**
Living with partner	0.84 (0.43–1.66)	**0.53 (0.32–0.87)**	**0.013**
Widowed/separated/Divorced	1.14 (0.60–2.16)	0.73 (0.47–1.13)	0.161
Covered by health insurance			
No	1.00	1.00	
Yes	0.33 (0.32–0.61)	1.35 (0.75–2.41)	0.316
Mother currently working			
No	1.00	1.00	
Yes	0.76 (0.65–0.88)	**1.24 (1.05–1.47)**	**0.011**

(*continued on next page*)

Table 2 (*continued*)

Variable	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	*p*-Value*
Geopolitical region of residence			
North-Central	1.00	1.00	
North-East	0.51 (0.40–0.67)	**0.68 (0.51–0.93)**	**0.014**
North-West	0.77 (0.59–1.01)	1.07 (0.78–1.47)	0.668
South-East	0.48 (0.35–0.65)	**0.49 (0.34–0.71)**	**0.001**
South-South	0.48 (0.36–0.66)	**0.52 (0.36–0.75)**	**0.001**
South-West	1.35 (0.96–1.89)	1.09 (0.74–1.59)	0.674

* Statistically significant values are bolded.

sources of care are generally preferred by parents.[11,22] Several factors have been implicated as to why these facilities are attractive to parents. Some of these include culture, teaching by parents/neighbors, unavailability and perceived cost of orthodox health care, among others.[11,16,21,22]

The younger child (age less than 36 months) was more likely to be taken to a health facility. This perception that younger children should receive appropriate care has been documented by other authors and may be related to parents perceiving these children as being especially "delicate".[23] Household characteristics have also been implicated in care-seeking behavior. The current study found that secondary and tertiary paternal education increased the chances of seeking care from appropriate sources by between 1.5 and 2.0 fold. Similar findings were reported in Malawi by Kazembe et al.[21] Paternal education undoubtedly improves understanding of illness and ability of parents to afford orthodox treatment. This finding strengthens the need to improve literacy rates in Nigeria as a proxy to improving care-seeking behavior. Interestingly, maternal education status was not significantly associated with care-seeking behavior. This contrasts with the findings of other smaller studies where maternal education was prominently associated with care-seeking.[11,16] This probably reflects the dominance of men in traditional Nigerian society in the decision making process. This is further exemplified by the finding in this study that decision making regarding the health of the mother was by the husband alone or others in 63% of respondents studied. This is similar to reports from DHS data in Malawi.[21] Efforts at women empowerment are strengthened by the finding in this study that women who were currently working were 1.2 times more likely to seek appropriate care.

Geographical area of residence significantly influenced care seeking behavior in this study. Compared to the North-Central region, residences in the South-East, South-South and North-East were associated with reduced chances of seeking appropriate care. This finding was independent of educational status, social status and religion of respondents. This is probably related to cultural differences in perception of health and disease. Kazembe et al. in Uganda reported similar geographical variations in care-seeking behavior among parents.[21] Ethnic reasons were partly implicated in the work of Kazembe et al. as being responsible for this finding.[21] This was not explored in the current study because of the immense cultural diversity from over 250 different ethnic groups in Nigeria.[14] Also, issues of access to health care in the different regions, such as availability and distance to health care facilities, which were not explored in this study may explain the observed influence of geographical area of residence on care seeking behavior. Religion was another factor associated with appropriate care-seeking. The basis of the relationship with religion is unclear. This may reflect the influence of so-called faith homes a practice commonly associated with the Christian faith as a prominent alternative to care-seeking in appropriate health facilities.[13]

The study has highlighted some variables that are crucial in determining how parents would react to febrile ill health in their children. Thus, it appears that efforts to improve care-seeking behavior should focus on improving literacy, empowering women to make decisions regarding health care, providing targeted education at special groups including the uneducated, members of the Christian faith and married unemployed women. The demonstrated geographical differences in care seeking behavior must also be taken into account in designing such intervention programs.

5. Conclusion

Care-seeking by parents for fever in their under-five children in Nigeria is poor and determinants of appropriate care-seeking include paternal education, religion, geographical region of residence, child age, and female empowerment.

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Conflict of interests

The authors declare no conflict of interest.

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