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# Careseeking for childhood diarrhoea at the primary level of care in communities in Cross River State, Nigeria



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## KEYWORDS

Care seeking;  
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**Abstract** Risk factors for care-seeking choices for childhood diarrhea in Nigeria are poorly understood. They are essential to the control of childhood illnesses because diarrhea is an important cause of childhood mortality. This study explored the contributors to care-seeking choices in Cross River State, Nigeria. Caregivers of children aged 0–59 months in 1240 randomly selected households in Cross River State were involved in this cross-sectional study. Questionnaires were used to collect information on demographics, knowledge of illness, and care-seeking patterns, and observed associations were explored using logistic regression. Care was given at home (50.4%,  $n = 142$ ; as recommended), at the health center (27%,  $n = 76$ ), and at the local drug store (19.1%,  $n = 54$ ). Main reasons for care sought were health education (31.9%,  $n = 94$ ), treatment cost (18%,  $n = 53$ ), and experiences (16.6%,  $n = 49$ ). Caregivers living in the mainly urban area of Calabar Municipality [Adjusted Odds Ratio (AOR) = 2.81 (1.26–6.26)] and the mainly rural area of Obanliku [AOR = 3.59 (1.94–6.64)], were more likely to give home treatment. Choice of treatment was only associated with area of residence. Influencers of care-seeking behavior, especially for childhood diarrhea, are complex and need to be better understood to encourage enhanced care for young children with diarrhea.

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## 1. Introduction

Globally, the rate of deaths in children below the age of 5 years has reduced, however, the decline is inconsistent, with only five countries (Nigeria, India, Pakistan, Democratic Republic of Congo, and China) [1] being responsible for more than

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50% of these deaths. The heaviest burden of deaths is found in sub-Saharan Africa where one in 12 children die before the age of 5 years [2]. Diarrhea is the second most important cause of deaths in children under 5 years in the countries in sub-Saharan Africa [3] including Nigeria. Although diarrhea incidence in Nigeria has reduced in the past 42 years, the number of deaths of children from diarrheal diseases is still high [4].

In 1978, the fight against diarrheal diseases in Nigeria began with the launch of the global Control of Diarrheal Diseases Program, which has since been through several modifications and is presently delivered through the community directed child survival program, Integrated Maternal, Neonatal and Child Health Program. The emphasis of this intervention was and remains on oral rehydration therapy [5], and was very successful in the 1980s leading to a very effective reduction in the mortality from childhood diarrhea, although there was no change in the incidence of childhood diarrhea especially at the primary level of health care. However, in Nigeria only 26% of children aged <5 years with diarrhea received oral rehydration solution during their illness [6], which is far below the recommended 80% that is required to show optimal use of the intervention to be able to impact on the burden of diarrheal diseases.

Although there was not enough data (at the time of the study) to ascertain the main causes of death in children below the age of 5 years in Cross River State specifically, for every 1000 live births, it was estimated that 250 children die before their fifth birthday, mostly from pneumonia or acute respiratory infections, diarrhea, and malaria, with malnutrition as an underlying factor complicating these causes [7]. An examination of caregiver knowledge of diarrheal disease showed that there was a low level of knowledge of the causes and primary management of the illness at home in northern Nigeria [8]. Further investigation in the southern part of Nigeria showed that although caregivers showed some knowledge of the disease, the use of drugs was more common compared to the recommended use of oral rehydration [9,10].

At the household level, the choice of care given to the young child is mainly determined by the perception of illness by the caregiver [11,12]. Care-seeking patterns may have evolved over the centuries, but it is a complex mix of dynamics that has been the subject of many an enquiry [11,13–17].

These factors include, amongst others, caregiver characteristics like the cultural factors that

influence the perception of illness [14,18], illness severity [19], knowledge of the signs and symptoms [20], their knowledge of the causes of the illness, educational status, and economic power [21]. Other factors like nearness of the household to health-care centers [22] and the supply of drugs [15,23], and the population demographics of the households [15] are also considerations in the patterns that eventually emerge in the care that is sought for the ill child.

In this study, the aim was to explore the burden of the illness and its contributing factors, and the different care-seeking routes used by caregivers at the first indication of illness by their young children and the factors that determine the care that is given during diarrheal illness.

The results of this study can be useful in strengthening the delivery of diarrheal disease interventions through the Integrated Maternal Neonatal and Childhood Health Program.

## 2. Materials and methods

### 2.1. Study area

Cross River State is situated in the south geopolitical zone of Nigeria and has a total population of 2,892,988 people (2006 census) of which 372,909 are below the age of 5 years. Spread out over its 18 local government areas (Fig. 1), the State is ethnically diverse. The health services in the State provide care at three levels; primary, secondary, and tertiary care. The primary level of care is the first point of contact at the community level and the different local government councils in the state are responsible for primary health care in their areas.

### 2.2. Study design

A cross-sectional study was carried out in randomly selected communities in five local government areas in Cross River State, Nigeria. The local government areas chosen were the mainly urban Calabar South and Calabar Municipal areas in the southern part of the State, the mainly rural Abi area in the central part of the State, and Obanliku and Yala areas in the northern part of the State (Fig. 1).

Using a two-stage cluster design, communities were selected from these local government areas. With a relatively high proportion of riverine communities, especially in the creeks, some of the selected communities were situated in the riverine areas while others were in nonriverine areas.

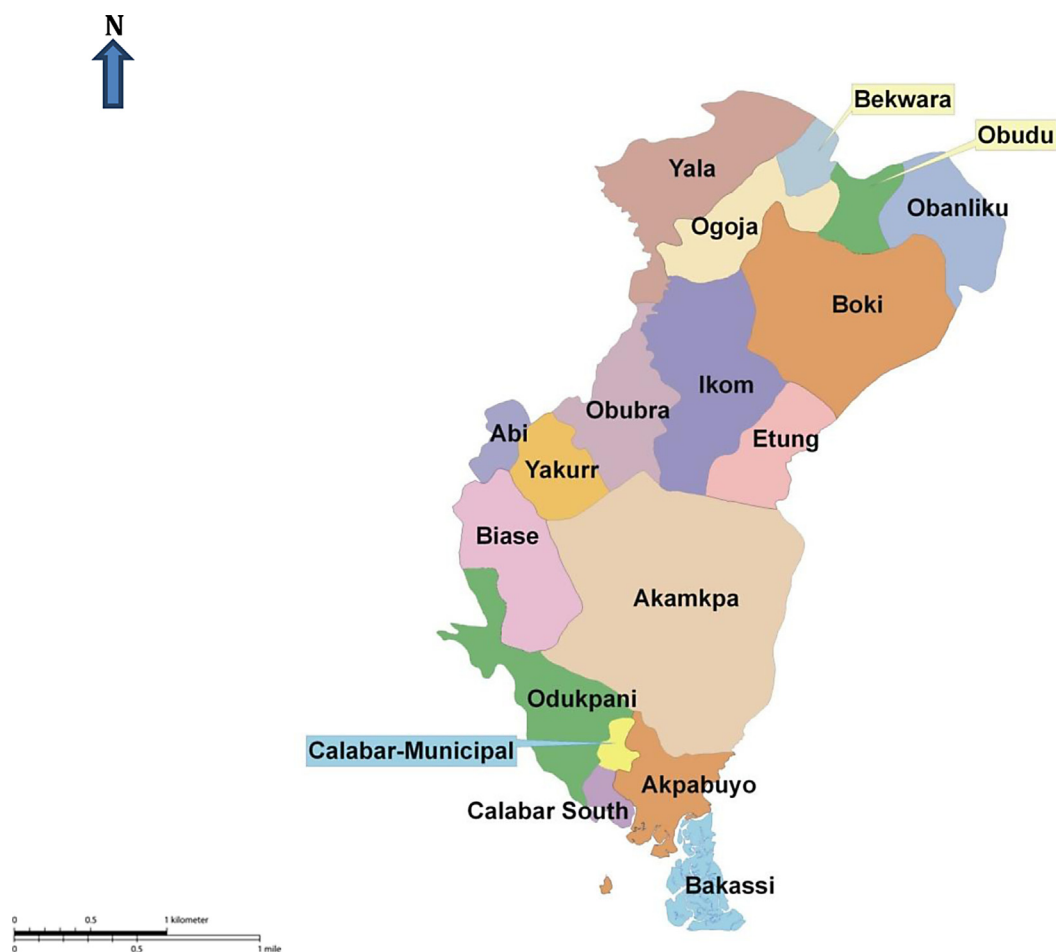


Fig. 1 Map of Cross River State, Nigeria showing local government areas.

### 2.3. Participants

A total of 1240 caregivers of children aged <5 years (adults with primary responsibility for the index child at the time of the study) were surveyed from 13 communities in five local government areas. All of the caregivers (100% response rate) aged between 18 years and 50 years in selected communities agreed to participate in the study, and only the youngest child was selected for the study if a family had more than one child in this age category who had presented symptoms of diarrhea in the 2-week period preceding the study. Informed consent was obtained from mothers or caregivers after they had received an explanation about the study's objective and method. The study protocol was reviewed and approved by the Ethical Committee of the Cross River State Ministry of Health, Calabar, Nigeria.

### 2.4. Data collection

In this study, diarrhea was defined as the passage of three or more loose stools or defecation

frequency of three or more loose/liquid stools in a day.

Data collection was done in three phases: (1) informal interviews: information on the protocol of management of childhood diarrhea was collected from care providers in the health care units at the local government areas selected; (2) training of interviewers: volunteers selected for their local experience in carrying out house to house visits for community child health were trained and supervised using a training guide and the data collection tools (questionnaire and flash cards); and (3) interview of caregivers: information was collected on sociodemographic factors of the family, knowledge of causes and symptoms of diarrhea, description of care provided during illness, and risk factors of diarrheal illness including breastfeeding, immunization, water sources and treatment of water, household hand washing arrangements, mother's knowledge of hand washing techniques, toilet facilities, and stool disposal methods.

Information collected using a semistructured questionnaire was validated using flashcards and interviewer's observation of household hand

washing arrangements and techniques, toilet facilities, and child's immunization records.

## 2.5. Recommended management of childhood diarrhea

Informal interviews with primary health-care coordinators supervising health care at the district level indicated the care information given to caregivers of young children. For children younger than 2 months presenting with diarrhea, mothers were advised to seek care at the health care facility. However, the care to be given to older children was based on the classification of the illness or the presenting symptoms (see [Table A1](#)). Caregivers received training on recognition of symptoms in order to be able to provide appropriate care during the diarrheal illness.

## 2.6. Statistical analysis

To show that at least 50% of caregivers adopted appropriate care seeking for diarrhea in their children, a study sample size of 1140 caregivers assuming a confidence interval (CI) of  $\pm 5\%$  and a confidence level of 95% was estimated.

Study data was coded and entered into Windows Microsoft Access 2013, Washington, United States of America IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp., which was then imported into SPSS version 20 where analysis was done.

Variables like maternal age, education, occupation, child's age, sex of child, area of living, and breastfeeding and immunization practices that had a  $p$  value  $< 0.05$  based on bivariate analysis by logistic regression testing, were considered as potential confounders. Adjusted odds ratios with 95% CI were used to assess factors that determined the care seeking choices of caregivers.

## 3. Results

### 3.1. Summary of participants

In summarizing the characteristics of caregivers in this study by local areas ([Table 1](#)), most caregivers who participated in this study were aged between 25 years and 50 years (59%,  $n = 124$  in Calabar South area to 83.9%,  $n = 120$  in Calabar Municipality area) with a higher proportion between 25 years and 34 years (44.7%,  $n = 102$  in Obanliku area to 74.1%,  $n = 106$  in Calabar Municipality area). All eligible caregivers participated in the study with a response rate of 100%.

Most caregivers had received some education, with the highest proportion of educated caregivers in the mainly urban Calabar Municipality area (97.9%,  $n = 140$ ) and the lowest proportion in the mainly rural Yala area (87.3%,  $n = 145$ ). Of the caregivers employed in the private and public sector jobs, there was a high proportion of farmers in the mainly rural Obanliku (34.8%,  $n = 80$ ) and Yala (34.9%,  $n = 58$ ) areas. Unemployed caregivers were either students or housewives and made up a higher proportion (41.8%,  $n = 197$ ) of respondents in the riverine mainly rural Abi area.

There was an almost equal male to female ratio amongst the index children (51.8%,  $n = 632$  to 48.2%,  $n = 588$ ). Although almost all of the children were breastfed, (70.9%,  $n = 163$  in the Obanliku area and 100%,  $n = 166$  in the Yala area), a higher proportion of children had incomplete immunization records (56.5%,  $n = 130$  in the Obanliku area to 95.1%,  $n = 136$  in the Calabar Municipal area) as was demonstrated by either having lost the child's immunization card or the observation of incomplete immunizations on cards sighted by the interviewers (see [Table 2](#)).

### 3.2. Burden of childhood diarrhea illness

There were 294 children who received care for diarrhea in the 2 weeks preceding the study and these children were mostly in the mainly rural areas of Abi (137), Obanliku (50), and Yala (40) areas.

Logistic regression analysis showed that factors that influenced diarrheal illness in the 2 weeks before the study were mother's age and education, the age of the child, and the sources of water supply with the treatment of water ([Table 3](#)). Unexpectedly, the child's immunization status was found to be positively associated with the odds of childhood diarrhea. These findings will be discussed in the next section.

### 3.3. Care for childhood diarrhea

Unlike the local recommended management (see [Table A1](#)), at the beginning of the illness most children (73%) received care outside the home, at the health-care facility (50.4%), at the local drug store (19.1%), and at the traditional healers (3.5%). Only 27% of the ill children received initial care at home as advised in the care protocol (see [Table A1](#)).

When care was received at home, the most common form of rehydration given was the government recommended salt sugar solution (43.6%) prepared at home using readily available salt, sugar, clean water, and oral rehydration solution (36.6%)

**Table 1** Summary of caregivers by local government areas.

Biodemographic variables		AB <sup>a</sup>	CM <sup>a</sup>	CS <sup>a</sup>	OB <sup>a</sup>	YL <sup>a</sup>
Maternal age (y) <sup>b</sup>	15–24	123 (26.1)	23 (16.1)	86 (41)	93 (40.8)	27 (16.3)
	25–34	272 (57.7)	106 (74.1)	111 (52.9)	102 (44.7)	97 (58.4)
	35–50	76 (16.1)	14 (9.8)	13 (6.2)	33 (14.5)	42 (25.3)
Maternal education	None	25 (5.3)	3 (2.1)	3 (1.4)	17 (7.4)	21 (12.7)
	Primary	140 (29.7)	27 (18.9)	42 (20)	94 (40.9)	61 (36.7)
	Secondary and higher	306 (65)	113 (79)	165 (78.6)	119(51.7)	84 (50.6)
Maternal religion	Others	13 (2.8)	2 (1.4)	–	1 (0.4)	1 (0.4)
	Christianity	458 (97.2)	141 (98.6)	210 (100)	229 (99.6)	165 (99.4)
Maternal occupation	Public sector jobs	59 (12.5)	20 (14)	41 (19.5)	11 (4.8)	12 (7.2)
	Private sector jobs	141 (29.9)	76 (53.1)	98 (46.7)	50 (21.7)	51 (30.7)
	Farmers	74 (15.7)	–	7 (3.3)	80 (34.8)	58 (34.9)
	Unemployed	197 (41.8)	47 (32.9)	64 (30.5)	89 (38.7)	45 (27.1)
Parity of mother <sup>c</sup>	1/2 Children	331 (70.6)	68 (55.7)	146 (69.5)	91 (41.9)	55 (34)
	≥ 3 Children	138 (29.4)	54 (44.3)	64 (30.5)	126 (58.1)	107 (66)
Living with spouse	No	73 (15.5)	35 (24.5)	71 (33.8)	81 (35.2)	43 (25.9)
	Yes	398 (84.5)	108 (75.5)	139 (66.2)	149 (64.8)	123 (74.1)

Data are presented as *n* (%).

AB = Abi; CM = Calabar Municipality; CS = Calabar South; OB = Obanliku; YL = Yala.

<sup>a</sup> Local government areas.

<sup>b</sup> Two mothers in the Obanliku area were not able to give their ages.

<sup>c</sup> Information on the parity of 40 interviewed mothers distributed in Abi, Calabar Municipality, Obanliku, and Yala areas could not be verified.

**Table 2** Summary of child characteristics by local government areas.

Variables	Local government areas <sup>a</sup>				
	AB	CM	CS	OB	YL
<i>Sex of child</i>					
Male	251 (53.3)	67 (46.9)	116 (55.2)	116 (50.4)	82 (49.4)
Female	220 (46.7)	76 (53.1)	94 (44.8)	114 (49.6)	84 (50.6)
<i>Age of child (mo)</i>					
≤1	62 (13.2)	7 (4.9)	29 (13.9)	12 (5.2)	28 (16.9)
2–5	53 (11.3)	17 (11.9)	46 (21.9)	24 (10.4)	14 (8.4)
6–11	102 (21.7)	18 (12.6)	42 (20)	23 (10)	19 (11.4)
12–18	43 (9.1)	12 (8.4)	20 (9.5)	29 (12.6)	13 (7.8)
19–24	42 (8.9)	15 (10.5)	22 (10.5)	22 (9.6)	17 (10.2)
25–36	69 (14.6)	36 (25.2)	22 (10.5)	47 (20.4)	40 (24.1)
37–59	100 (21.2)	38 (26.6)	29 (13.8)	73 (31.7)	35 (21.1)
<i>Breastfed</i>					
Yes	469 (99.6)	139 (97.2)	203 (96.7)	163 (70.9)	166 (100)
No	2 (0.4)	4 (2.8)	7 (3.3)	67 (29.1)	–
<i>Immunization</i>					
Complete	176 (37.4)	7 (4.9)	34 (16.2)	100 (43.5)	71 (42.8)
Incomplete	295 (62.6)	136 (95.1)	176 (83.8)	130 (56.5)	95 (57.2)

Data are presented as *n* (%).

AB = Abi; CM = Calabar Municipality; CS = Calabar South; OB = Obanliku; YL = Yala.

<sup>a</sup> Local government areas.

**Table 3** Summary of environmental factors by local government areas.

Environmental factors	AB	CM	CS	OB	YL
<i>Sources of drinking water</i>					
Open sources	242 (53.7)	89 (63.6)	161 (76.7)	229 (100)	166 (100)
Closed sources	209 (46.3)	51 (36.4)	49 (23.3)	—	—
<i>Sources of household water</i>					
Open sources	270 (59.7)	92 (65.7)	162 (77.1)	229 (100)	166 (100)
Closed sources	182 (40.3)	48 (34.3)	48 (22.9)	—	—
<i>Water treatment</i>					
No treatment	139 (29.5)	112 (78.3)	168 (80.4)	30 (13.1)	14 (8.4)
Treatment of water	332 (70.5)	31 (21.7)	41 (19.6)	199 (86.9)	152 (91.6)
<i>Household hand washing arrangements</i>					
No arrangements	120 (25.6)	4 (2.8)	—	118 (51.3)	7 (4.2)
Some arrangements	140 (29.9)	26 (18.3)	58 (27.6)	58 (25.2)	103 (62)
Adequate arrangements	208 (44.4)	112 (78.9)	152 (72.4)	54 (23.5)	56 (33.7)
<i>Hand washing-when?</i>					
None	115 (24.4)	10 (7.1)	—	56 (24.5)	34 (20.6)
After work	16 (3.4)	1 (0.7)	2 (1)	43 (18.8)	13 (7.9)
After toilet/child stool disposal	283 (60.1)	114 (80.9)	161 (76.7)	59 (25.8)	104 (63)
Before food preparation	57 (12.1)	16 (11.3)	47 (22.4)	71 (31)	14 (8.5)
<i>Hand washing technique</i>					
Know some steps	345 (73.4)	120 (84.5)	205 (98.1)	222 (96.9)	117 (70.5)
Know all steps	125 (26.6)	22 (15.5)	4 (1.9)	7 (3.1)	49 (29.5)
<i>Toilet facilities</i>					
Open defecation	187 (40.6)	—	—	99 (43.4)	110 (67.1)
Pit latrine/ventilated improved pit latrine	211 (45.8)	68 (47.6)	159 (76.1)	123 (53.9)	29 (17.7)
Flush system toilet	63 (13.7)	75 (52.4)	50 (23.9)	6 (2.6)	25 (15.2)
<i>Child stool disposal</i>					
Open/buried/covered in sand	37 (8.1)	—	—	57 (30.3)	82 (50)
Into garbage/gutter	250 (54.7)	10 (7.1)	31 (14.8)	57 (30.3)	32 (19.5)
Into the toilet	170 (37.2)	131 (92.9)	179 (85.2)	74 (39.4)	50 (30.5)

Data are presented as *n* (%).

AB = Abi; CM = Calabar Municipality; CS = Calabar South; OB = Obanliku; YL = Yala.

purchased at the local drug stores or health care centers (see [Tables 4–6](#)).

Maternal characteristics of age, education, and knowledge of diarrhea causes and symptoms were not significantly associated with the choices of care for diarrheal illness. However, living in Abi (95% CI = 1.34–2.97) and Calabar South (95% CI = 1.97–6.73) was associated with increased odds of using the health facility, while living in Calabar Municipality (95% CI = 1.63–6.25) and Obanliku areas (95% CI = 1.74–5.14) was associated with giving care for childhood diarrhea at home.

## 4. Discussion

### 4.1. Determinants of diarrheal illness

In this study, children of educated older mothers aged between 25 years and 50 years were less likely

to present with diarrhea. Similar to the Vietnamese study in rural communities [24] and the Saudi Arabian study in an urban city [25], the younger caregivers had a lower level of understanding of the causes and symptoms of diarrhea and so their children are at a higher risk of illness. These observations were also usually linked with low educational levels.

Educational status is a determinant of the socioeconomic influences on the health status of the child through the economic potential of the mother. This is a good indicator of the available health care that can be used for childcare as demonstrated by the effect of education irrespective of level-primary or secondary-being protective for childhood diarrhea. The enlightenment received by the mother influences all care decisions including health-care decisions that are made by the mother [26]. A more literate mother is likely

**Table 4** Caregiver factors influencing childhood diarrhea.

Influencing factors (caregiver, child, environmental)	Children without diarrhea <i>n</i> (%)	Children with diarrhea <i>n</i> (%)	Odds ratio (95% CI)
<i>Maternal age (y)</i>			
15–24 <sup>a</sup>	249 (26.9)	103 (35)	Reference
25–34 <sup>b</sup>	531 (57.5)	157 (53.4)	0.63 (0.44–0.90)
35–50 <sup>b</sup>	144 (15.6)	34 (11.6)	0.42 (0.25–0.71)
<i>Maternal education</i>			
No education <sup>a</sup>	43 (4.6)	26 (8.9)	Reference
Primary education <sup>b</sup>	274 (29.6)	90 (30.7)	0.41 (0.22–0.75)
Secondary education <sup>b</sup>	609 (65.8)	177 (60.4)	0.37 (0.20–0.67)
<i>Living with spouse</i>			
Not living with spouse <sup>a</sup>	218 (23.5)	85 (28.9)	Reference
Living with spouse <sup>b</sup>	708 (76.5)	209 (71.1)	0.68 (0.48–0.97)
<i>Age of child</i>			
≤1 <sup>a</sup>	122 (13.2)	16 (5.4)	Reference
2–5 <sup>c</sup>	117 (12.6)	36 (12.2)	2.77 (1.41–5.42)
6–11 <sup>c</sup>	134 (14.5)	70 (23.8)	4.75 (2.52–8.92)
12–18 <sup>c</sup>	93 (10.1)	42 (14.3)	4.41 (2.21–8.82)
19–24 <sup>c</sup>	80 (8.6)	38 (12.9)	4.01 (2.01–8.02)
25–36 <sup>c</sup>	154 (16.6)	42 (14.3)	2.79 (1.45–5.37)
37–59	225 (24.3)	50 (17)	2.08 (1.09–3.97)
<i>Immunized</i>			
Complete <sup>c</sup>	269 (29.1)	119 (40.6)	1.43 (1.05–1.93)
Incomplete <sup>a</sup>	656 (70.9)	174 (59.4)	Reference
<i>Sources of drinking water</i>			
Open sources <sup>b</sup>	708 (78.2)	179 (61.5)	0.31 (0.15–0.64)
Closed sources <sup>a</sup>	197 (21.8)	112 (38.5)	Reference
<i>Water treatment</i>			
No treatment <sup>a</sup>	362 (39.2)	101 (34.4)	Reference
Treatment of water <sup>b</sup>	562 (60.8)	193 (65.6)	0.63 (0.42–0.94)

CI = confidence interval.

<sup>a</sup> Reference group.<sup>b</sup> Reduced odds of reporting symptoms of diarrhea in the 2 weeks preceding the study.<sup>c</sup> Increased odds of reporting symptoms of diarrhea in the 2 weeks preceding the study.

to be more receptive of health education messages, translating them to enhance the health of household members including the young child. Unlike other similar studies [27,28] that have not been able to show a significant association between maternal education and the risk of childhood diarrhea, this study demonstrated the importance of maternal education in determining the risk of disease in this population subgroup.

The significantly increased risk of diarrheal illness in children between the ages of 2 months and 36 months is due to the protective effect of breastfeeding in younger infants. Breastfeeding has been shown to be protective against infectious disease more so when the children are exclusively breastfed [29]. Older children are more readily influenced by negative environmental influences

compared to younger children (<2 months of age). In this study, the different types of toilet facilities for eight out of 10 households were either open defecation or pit latrines, which are propagators of diarrheal illnesses (Table 3). This is an important finding because it reinforces the need for environmental modification in the health awareness intervention that is a major part of diarrhea control at the primary level of health care. Pit latrines and open defecation methods of fecal disposal are associated with environmental contamination and this in addition to the increased mobility of children at this age, who are either crawling or walking, increases the risk of infection and thus diarrheal illness. This finding, like the Lagos study by Ekanem et al. [9] and the Ibadan study by Olorunfoba et al. [30], which also showed a



**Table 5** Characteristics of primary care given for childhood diarrhea.

Characteristics of primary care		<i>n</i>	%
Primary care given	Health facility	142	50.4
	Home	76	27
	Drug store	54	19.1
	Traditional treatment	10	3.5
Reason for primary treatment	Health education	94	31.9
	Low cost	53	18
	Previous experience	49	16.6
	Easy access	45	15.3
	'Normal'	35	11.9
	No reason	19	6.4
Oral rehydration treatment given <sup>a</sup>	Salt sugar solution (SSS)	88	43.6
	Oral rehydration solution (ORS)	74	36.6
	Herbal remedies/traditional drugs	28	13.9
	Water only	12	5.9
Frequency of meals during illness	Less than usual	192	67.8
	Same as usual	83	29.3
	More than usual	8	2.8
Success of primary care	Child got better	152	52.1
	Child's symptoms got worse	140	47.9
Recognition of danger signs <sup>b</sup>	Signs of dehydration	—	—
	Increased frequency of stools	111	79.3
	Restlessness	11	7.9
	Stopped eating	16	11.4
	Body weakness	53	37.9
	Vomiting	14	10

ORS = oral rehydration solution; SSS = salt sugar solution.

<sup>a</sup> 69% (*n* = 202) of children with diarrhea received any kind of rehydration therapy.

<sup>b</sup> Proportion of caregivers who gave further care after recognizing danger signs of diarrhea as listed.

**Table 6** Adjusted factors influencing care seeking choices.

Variables	Home treatment <i>n</i> (%)	Odds ratio (home treatment) (95% CI)	Health facility treatment <i>n</i> (%)	Odds ratio (health facility treatment) (95% CI)
<i>Area of residence</i>				
Abi	20 (26.3) <sup>a</sup>	0.44 (0.27–0.71)	81 (57) <sup>b</sup>	2.00 (1.34–2.97)
Calabar Municipal	15 (19.7) <sup>b</sup>	3.19 (1.63–6.25)	7 (4.9) <sup>a</sup>	0.48 (0.23–1.00)
Calabar South	4 (5.3) <sup>a</sup>	0.28 (0.12–0.67)	29 (20.4) <sup>b</sup>	3.64 (1.97–6.73)
Obanliku	27 (35.5) <sup>b</sup>	2.99 (1.74–5.14)	10 (7) <sup>a</sup>	0.35 (0.19–0.64)
Yala	10 (13.2)	0.85 (0.45–1.62)	15 (10.6)	0.83 (0.46–1.48)

CI = confidence interval.

<sup>a</sup> Reduced odds of using home treatment or health facility treatment.

<sup>b</sup> Increased odds of using home treatment or health facility treatment.

significant association between the use of unimproved toilet facilities and the occurrence of childhood diarrhea in younger children, illustrates the importance of improving sanitation in the prevention of diarrheal illness.

Unexpectedly, children who had completed immunization for their ages were at a higher risk of illness. Information on completeness of immunization was collected using the sighting of immunization cards, which was not always present

even when caregivers reported that children had completed immunizations for age. This may have underestimated the number of children who had completed their immunizations for age.

#### 4.2. Gaps in care provisions for diarrhea

At the primary level, recommended care for children who presented with diarrheal illness was variable depending on the presenting symptoms and signs as outlined in the protocol of management, however, the majority of caregivers accessed care outside the home mainly because of their perception of the health education messages they had received. The ability of caregivers to recognize symptoms and signs of disease has been highlighted in timely care seeking, however in this study, caregivers were not able to recognize danger symptoms of dehydration that would encourage treatment to be given appropriately.

Although other studies [14,31,32] have argued that the caregiver's perception of the cause of illness is a major determinant of the choice of care sought, in this study, the knowledge of causes or symptoms of diarrhea was not significantly associated with care seeking avenues used. The observed difference from one area to another may be due to local variations in the delivery of health care interventions at the local level; however, the delivery of interventions (health education and awareness drive) was outside the scope of this investigation. The examination of determinants of care is an important consideration because it underscores the fact that recommended care will have to be modified to local factors influencing the choice of care for childhood diarrhea. These factors include, but are not limited to cultural interactions, differ-

ential income generation, and the relative availability of alternative health care providers like local drug store, traditional healers and the religious organizations. Integrating care at the local level to include these alternative care providers requires the recognition and standardization of the care offered for child health and this can be done at the local level. This will strengthen the health care system for the provision of child health care services to improve the delivery of care for childhood diarrhea.

Unlike the investigation of health care seeking in a hospital based cohort in Shagamu, Nigeria [33], maternal factors of age and education were not found to significantly influence the care seeking pattern of caregivers. This is observed even though the majority (73%) of the respondents sought care outside the home at the onset of the illness, mainly because the health education messages they perceived directed them to do this.

#### 5. Conclusion

Popular health-care seeking models have, in the past, considered care sought outside the home as the standard for appropriate care, even in childhood diarrhea where care at home is increasingly advocated [34]. This study shows the care-seeking behavior for childhood diarrhea in children aged <5 years in communities in Cross River State, Nigeria, where the primary care recommended is home care with rehydration using recommended fluids. Assuming that the health-care team at the primary level of care has been able to deliver the health education messages for the appropriate care of children with diarrhea, the predominant care given

**Table A1** Protocol of management for diarrhea in children between 2 months and 59 months.

Diarrhea classification	Symptoms	Management
Mild	<ul style="list-style-type: none"> <li>No symptoms</li> <li>Passage of 3 or more loose stools in 24 h</li> </ul>	<ul style="list-style-type: none"> <li>Management at home</li> <li>Rehydration with SSS/reconstituted ORS with every loose stool and when child is thirsty</li> <li>Continue feeding (including breastfeeding)</li> <li>Maintain good hygiene</li> <li>Sanitary disposal of feces</li> <li>Keep child warm and watch for stooling frequency</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>Thirst</li> <li>Weakness</li> </ul>	<ul style="list-style-type: none"> <li>Same as above</li> </ul>
Severe	<ul style="list-style-type: none"> <li>Signs of dehydration with irritability, reduced skin elasticity, sunken eyes</li> <li>Persistent passage of loose stools</li> <li>Signs of shock with low urine output, cold extremities</li> </ul>	<ul style="list-style-type: none"> <li>Seek care at health facility</li> </ul>

ORS = oral rehydration solution; SSS = salt sugar solution.

is not indicative of this protocol of treatment in order to minimize the effect of the illness.

While the results of this study have shown that more work needs to be done in establishing determinants of care-seeking behavior for childhood diarrhea, consideration should be given to the adaptation of the health-care interventions to local needs and health-care provisions. This has the potential to improve care seeking behavior, thus removing barriers to health-care provision for childhood diarrhea.

There is also an increasing need to continue to encourage the education of girls as future mothers whose interpretation of health education will improve their care-seeking behavior and through this, the health status of their young children.

## Conflicts of interest

All contributing authors declare no conflicts of interest.

## Appendix A.

See [Table A1](#).

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