

# Knowledge and practice of acute diarrhoeal control in under-five children among primary health care workers in Bende LGA, Abia State, Nigeria

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**Abstract:** Introduction Acute diarrhoea diseases remain a leading cause of preventable death, especially among under-five children in developing countries. This study assessed the knowledge and practice of diarrhoea disease control among primary health care workers in selected facilities in Bende LGA, Abia State. Methods A facility – based cross sectional study carried out from Jan, 6 – 20, 2020. Data were collected using pre-tested, interviewer administered, semi-structured questionnaire in three sections and analyzed with Statistical Packages for Social Sciences (SPSS) version 21. Frequency tables and chi-square test were done with level of significance at  $p \leq 0.05$ . Results A total of 150 questionnaires were analyzed. The mean age of respondents was  $40.22 \pm 8.64$ , with females, 140(93.3%), married 118(78.7%), and had children 114(76.0%). Knowledge of diarrhoea disease was good with overall score  $>80\%$ . Religion and having at least a child showed statistically significant associations with the knowledge of acute diarrhea ( $X^2=15.0$ ; P-value=0.002, and  $X^2=26.0$ ; P-value =0.001 respectively). There was also good promotion of practice of diarrhoea control with score  $>80\%$ . Marital status ( $\chi^2=16.8$ , P-value  $<0.001$ ), having at least a child ( $\chi^2=12.07$ , P-value  $<0.001$ ), religion ( $\chi^2=16.91$ , P-value  $<0.025$ ) and knowledge about acute diarrhoea ( $\chi^2=28.025$ , P-value  $<0.001$ ) showed statistically significant associations with the promotion of practice of acute diarrhoeal control. Conclusion The respondents showed good knowledge of diarrhoea disease and promotion of practice of its control. The major source of information for their knowledge was from workshop trainings. This exemplifies the need for sustained human resource capacity building at the primary health care level.

**Keywords:** Health care workers; knowledge; practice; control; diarrhoea disease.

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## 1. INTRODUCTION

Primary health care is “the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work and constitutes the first element of a continuing health care process”. [1] One of its elements is prevention and control of locally endemic and epidemic

diseases.[1],[2] Acute diarrhoea, being one of such diseases, remains a leading cause of mortality in children under-five years of age worldwide, despite significant progress in reducing child mortality in the last decades. It is defined as passage of loose or watery stools at least three times per day, or more frequently than normal for an individual .[3] Incidence of diarrhoea is highest in the first two years of life and declines as a child grows older. Among this age group, it may be life-threatening, particularly in those who are malnourished or have impaired immunity .[4],[5] The causative organism is faeco-orally transmitted through faecal contamination of water, food, hands, eating and drinking utensils, flies, and dirt under fingernails in poorly hygienic environment .[6] Apart from causing significant mortality and morbidity, diarrhoea is also a leading cause of malnutrition in children under-five years old due to its association with anorexia and poor nutrient absorption. The long-term impacts of diarrhea include growth retardation, substantially impaired physical fitness, diminished cognitive capacity and delayed achievement at school .[7] Therefore, it impacts both child's health, education and the country's economic development .[8]

Though the global under-five mortality from acute diarrhoea has decreased from 4.5 million to 1.8 million annually in the last decade, acute diarrhoea continues to take a huge toll on children's health in developing countries.[9] Acute diarrhoea represents a significant burden on the health system, the household, and the nutritional status of children.[10] It is the second leading killer of children under the age of five, accounting for approximately 15% of under-five child deaths worldwide.[11] An annual estimate of 2.5 billion cases of diarrhoea occur among children under five years of age worldwide with more than half of these cases in Africa and South Asia, where bouts of diarrhoea are more likely to result in death or other severe outcomes [12] The comprehensive Global Burden of Disease Study in 2010 demonstrated that in 1990, diarrhoeal disease was the second overall cause of years of life lost (YLL), whereas in 2010, it was ranked eighth. This represented 626,000 YLLs in 1990 and 117, 00 YLLs in 2010, or an 82% difference. Although over the last decade there has been a decline in the total global mortalities due to diarrhoea, the morbidity from diarrhoea may not have shown a similar decline.[13] These improvements in mortality have been attributed to increased use of oral rehydration therapy (ORT), improved nutrition, increased breastfeeding, better supplemental feeding, female education, measles immunization and improvements in hygiene and sanitation.[14]

According to WHO, in Southeast Asia and Africa, diarrhoea is responsible for as much as 8.5% and 7.7% of all deaths respectively. In Africa, it has been estimated that every child has five episodes of diarrhoea per year and that 800,000 children die each year from diarrhoea and dehydration. [12],[ 15]

In West Africa, it accounts for an estimated 150,000 deaths yearly amongst children under five due to poor hygienic and sanitary practices. [16]The prevalence rate of diarrhoea in Nigeria is 18.8% and is a menace in Sub-Saharan Africa. However, most of these deaths are preventable through improvements in water, sanitation, hygiene, nutrition, breastfeeding, and immunization. [17] It is noteworthy that >90% of cases of acute diarrhoea can be effectively treated with oral rehydration and zinc. Intravenous fluids, and antibiotics in select cases, are used where severe vomiting does not permit oral fluid therapy. [18]There is an 11-fold increase in the risk of infants dying from diarrhoea when they are not exclusively breastfed in their first six months of life. Malnutrition, often caused by inadequate infant feeding practices, can result in a five-to-ten-fold increase in a child's risk of death from diarrhea.[18 ]

Numerous studies have identified poor personal and community hygiene, and health practices as important drivers of acute diarrhoea, making it more compelling for health workers to educate caregivers on diarrhoea prevention through their practice of diarrhea control. Healthy behavior can reduce the risk of diarrhea by 36–48% [19].

Primary health care workers are trained to control and treat acute diarrhoea using WHO-recommended guideline on oral rehydration therapy (ORT) and other measures in rural areas. Improper control of childhood diarrhoea has been shown to be due to lack of knowledge and practice of diarrhoea control among primary health care workers.[20] Filling these gaps in knowledge and practice is imperative to ensure that health workers appropriately educate mothers on preventive measures against acute diarrhoea.[21] This is particularly critical in remote areas where caregivers have limited access to health care and health education. One such area is Bende local government area where inhabitants have access only to primary health care facilities.

This study aimed to assess the knowledge and promotion of practice of diarrhoea disease control among primary health care workers in selected facilities in Bende LGA, Abia State.

## 2. METHODOLOGY

### Study area, study design and study period

This was a cross-sectional facility-based study conducted in Bende Local Government Area of Abia State, Nigeria from January 6 -20, 2020. Bende is one of the 17 local government areas of the state with 13 Ward Health Care Centers accredited for primary health care under one roof and Basic Health Care Provision Fund. Primary Health Care facilities are the only functional sources of health services in the local government.

### Sample size and sampling technique

Ten facilities were purposively selected for meeting eligibility criteria. Inclusion criteria included; being an accredited ward health center with appropriate staff mix, carry out full primary health care services including health education, and have facilities for admission and resident staff. Health facilities that were under staffed and had no provision for patient observation or admission were excluded. All providers of primary health care services in each selected facility were included in the study, giving a total sample size of 168.

### Data collection

Trained research assistants conducted the survey using validated, pre-tested, interviewer-administered, semi-structured questionnaire. The purpose of the study was explained to the health care workers in each facility before they enrolled for the study. The interview consisted of questions on socio-demographics, questions to assess knowledge of diarrhoea, and an assessment of promotion of practice of diarrhoea control. Both the knowledge assessment and the practice of diarrhoea control questionnaire were developed using literature review. The knowledge assessment included questions on the awareness, source of information, definition, cause, transmission, and danger signs of diarrhea, while promotion of practice of diarrhoeal control included questions on breast feeding, complementary feeding, measles immunization, personal and domestic hygiene, use of zinc plus ORS and use of antibiotics. It was pretested on 20 health workers in non-participating facilities to assess sequencing of the questions and the reliability of the instrument. The Cronbach's alpha coefficient was 0.777, demonstrating a high level of internal consistency.

### Scoring

On the knowledge questions, respondents were classified as having poor knowledge/practice if they answered correctly less than 60% of the questions, fair knowledge/practice, 60%–80% or good knowledge/practice, above 80%, based on their overall score and score within each subsection.

### Data management and analysis

Data were entered, cleaned and analyzed using SPSS version 21. In the descriptive analysis, number, percent, mean, and standard deviation were used to describe the variables and chi-square test for calculating differences between proportions. The level of significance was  $p \leq 0.05$ .

### Ethical consideration

The State Primary Health Care Development Agency and Local Government Health Authority secretary gave approval for the study. Written informed consent was obtained from the study participants and the questionnaire did not bear their identities to ensure confidentiality. The interviewers were also not known to the study participants.

## 3. RESULTS

### Socio-demographic profile of respondents

A total of 150 health care workers out of 168 who participated in the study returned correctly filled questionnaire giving a response rate of 89.3% ( $150/168 \times 100$ ). One hundred and forty (93.3%) respondents were females, 118 (78.7%) married, and 114 (76.0%) had at least a child. Majority of the respondents, (93.3%) were of Christian denomination while 10 (6.7%) were of other faith. The mean age of the respondents was 40.2 years (SD 8.64 years) as shown in Table 1.

TABLE 1. Socio- demographic characteristics of participants

VARIABLES	FREQUENCY (N=150)	PERCENT
<b>Age group (years)</b>		
21 – 30	34	22.7
31 – 40	49	32.7
41 – 50	47	31.3
51 – 60	20	13.3
<b>Mean± SD</b>	<b>40.20 ± 8.64</b>	
<b>Sex</b>		
Male	10	6.7
Female	140	93.3
<b>Current Marital status</b>		
Married	118	78.7
Single	32	21.3
<b>Have any child/children</b>		
Yes	114	76.0
No	36	24.0
<b>Religion</b>		
Christianity	140	93.3
Others	10	6.7

### Knowledge of acute diarrhea

Out of 150 respondents, 135(90.0%) were totally aware of acute diarrhoea disease. Majority of the respondents, 130(86.7%), sourced their information through workshop training, while 14(9.3%) and 6(4.0%) from colleagues and other sources respectively. One hundred and forty (93.3%) respondents defined acute diarrhoea correctly; 138(92.0%) correctly answered the mode of transmission; 135(90.0%) knew danger signs of acute diarrhoea, while 130(80.7%) knew the causes of acute diarrhoea. Table 2, shows the respondents' knowledge about acute diarrhoea. According to overall knowledge score, majority, 135 (90.0%) had good knowledge with >80% score, while 15 (10.0%) respondents had poor knowledge with <60% score. Among the socio-demographic variables, Religion and having at least a child showed statistically significant association with the knowledge status on acute diarrhoea,  $X^2 = 15.0$ ; P-value=0.002, and  $X^2 = 26.0$ ; P-value =0.001 respectively as shown in Table 3.

TABLE 2: Responses to knowledge questions about acute diarrhoeal diseases among primary health care workers

Questions	Responses	Frequency (%)
<b>Have you ever heard about acute diarrhoeal Diseases?</b>	Yes	135 (90.0)
	No	15 (10.0)
<b>What is your source of information?</b>	Workshop training	130(86.7)
	Colleagues	14(9.3)
	Others	6 (4.0)
<b>Define diarrhoea</b>	Correct	140 (93.3)
	Incorrect	10 (6.7)
<b>What are the causes of acute diarrhoea?</b>	Correct	130(86.7)
	Incorrect	20(13.3)
<b>What is the mode of transmission?</b>	Correct	138(92.0)
	Incorrect	12(8.0)
<b>What are danger signs of acute diarrhoea?</b>	Correct	135(90.0)
	Incorrect	15(10.0)

**Table 3. Association between socio-demographic variables and respondents' knowledge about acute diarrhoea.**

Variables	Knowledgeable (%)	Not Knowledgeable (%)	X <sup>2</sup> (P-value)
<b>Age group</b>			
21-30	23(67.6)	11(32.4)	
31-40	43(87.8)	6(12.2)	
41-50	38(80.9)	9(19.1)	1.89(0.48)
>50	18(90.0)	2(10.0)	
<b>Sex</b>			
Male	8(80.0)	2(20.0)	
Female	122(87.1)	18(12.9)	0.06(0.80)
<b>Marital status</b>			
Married	98(83.1)	20(16.9)	
Unmarried	24(75.0)	8(25.0)	1.18(0.59)
<b>Have any child/children</b>			
Yes	106(93.0)	8(7.0)	
No	29(80.6)	7(19.4)	26.0(0.001)*
<b>Religion</b>			
Christianity	131(93.6)	9(6.4)	
Others	7(70.0)	3(30.0)	15.0(0.002)*

\*Statistically significant

#### Promotion of practice of acute diarrhoea control

The respondents practiced; promotion of exclusive breast feeding, improved complementary feeding at six month, immunization against measles, promotion of personal and domestic hygiene and use of Zinc+ORS;136( 90.0%), 130(86.7%), 135( 90.0%),135( 90.0%) and 140( 93.3%) respectively. Only 8(5.3%) respondents admitted to advising on antibiotic use in acute diarrhoea as shown in Table 4. Overall, majority of the respondents (90.8%) demonstrated good practice of promotion of diarrhoeal control as they scored above 80% on the practice score. Among the socio-demographic variables, marital status ( $\chi^2 = 16.8$ , P-value < 0.001), having at least a child ( $\chi^2 = 12.07$ , P-value < 0.001) and religion ( $\chi^2 = 16.91$ , P-value < 0.025) had a statistically significant association with the promotion of practice of acute diarrhoea control. Additionally, knowledge about acute diarrhoea showed a statistically significant association with the practice of acute diarrhoeal control ( $\chi^2 = 28.025$ , P-value < 0.001) as shown in Table 5.

**TABLE 4. Respondents' responses to questions on promotion of practice of acute diarrhoeal control among healthcare workers**

Questions	Responses	Frequencies (%)
Ever explained exclusive breast feeding?	Yes	136(90.7)
	No	14(9.3)
Ever advised on complementary feeding at 6 months?	Yes	130 (86.7)
	No	20 (13.3)
Ever asked about immunization against Measles?	Yes	140(93.3)
	No	10 (6.7)
Do you advise on personal and domestic hygiene?	Yes	135 (90.0)
	No	15 (10.0)
Do you promote Zinc + ORS use in diarrhoea?	Yes	140(93.3)
	No	10 ( 6.7)
Do you recommend antibiotics for acute diarrhoea?	Yes	8(5.3)
	No	142(94.7)

**Table 5. Association between socio-demographic variables with knowledge about diarrhoea and promotion of practice of acute diarrhoeal control.**

Variables	Promote practice of diarrhoeal control (%)	Do not promote practice of diarrhoeal control (%)	X <sup>2</sup> (P-value)
<b>Age group</b>			
20-30	22(64.7)	12(35.3)	0.38(0.91)
31-40	42(85.7)	7(14.3)	
41-50	36(76.6)	11(23.4)	
>50	17(85.0)	3(15.0)	
<b>Sex</b>			
Male	7(70.0)	3(30.0)	1.98(0.28)
Female	120(85.7)	20(14.3)	
<b>Marital status</b>			
Married	95(80.5)	23(19.5)	16.8(0.001)*
Unmarried	22(68.8)	10(31.2)	
<b>Have any child/children</b>			
Yes	102(89.5)	12(10.5)	12.07(0.001)*
No	25(69.4)	11(30.6)	
<b>Religion</b>			
Christianity	128(91.4)	12(8.6)	16.91(0.025)*
Others	5(50.0)	5(50.0)	
<b>Knowledge</b>			
Knowledgeable	107	28	28.025(0.001)*
Not knowledgeable	5	10	

\*Statistically significant

#### 4. DISCUSSION

This is the first facility-level study on this topic in the study area among primary health care workers, particularly underpinning current dearth of data on outcomes of capacity building among this group. Since these providers work in the rural areas with limited health care facilities, hence, are the only health educators to the mothers; it is critical to assess their knowledge and promotion of practice of diarrhoea control so that intervention programs may be better targeted if necessary.

Majority of respondents were females (93.3%). This is not uncommon in Nigeria where females dominate this cadre of health workers (Midwife, Nurse, CHEW, JCHEW etc). Majority of them were also married (78.7%) with at least a child (76.0%). These agree with the age range of respondents (31-40 years) in the study area within which most women would have been married and possibly have children. Majority, 93.3% were Christians in keeping with the dominant religion in the study area.

In this study, the respondents showed an overall good knowledge of acute diarrhoea with the vast majority (90.0%) scoring >80%. This finding is in keeping with a study in Benin-City where 86.5% of respondents scored above 80%. [22] However, an Indian study reported a lower knowledge score of 74.6% among health workers. [23] There is a possible reason for this difference. This study showed that the major (86.7%) source of information was continuous trainings at workshops. This is particularly so because the participating facilities are parts of the new paradigm in primary health care; primary healthcare under one roof. One of the pillars is continuing human resources capacity building in the delivery of health services.[24] This is not uncommon and is known to be true even in high-income countries. The correlation we observed in our study of workshop as a major source of information enhancing higher knowledge scores is consistent with the literature. Training workshops for health care workers offer a great opportunity to deepen their knowledge and understanding of the basic diarrhoeal control strategies in addition to current WHO guidelines.[25] This is, indeed, most important for primary health care workers who constitute the first level of contact with individuals and community and should be veritable frontline educators of mothers and caregivers on the control of acute diarrhoea.



This study revealed that majority of the respondents practiced promotion of practice of diarrhoeal control, especially in subsections on breastfeeding, measles immunization, personal hygiene and use of Zinc+ORS. A previous study in Trinidad reported low use of ORS in the management of acute diarrhea.[26] In that study, although 39.3% agreed to the use of ORT alone for the management of acute diarrhea, 15% did so in actual practice. Sixty per cent reported recommending ORT only, while 2% were observed to do so.[26] The behavior observed in that study was not as a result of lack of knowledge. Many health professionals know that they should be recommending more ORT and fewer medicines for childhood diarrhea. The opposition to the use of ORT alone in the treatment of acute diarrhea in children by 54.4% of pharmacists shows disregard to the guideline stipulated by WHO. This low recommendation of ORT shows that there is still need to renew the campaign on the use of ORT amongst physicians, pharmacists, other health care professionals and the entire community.

However, only few, 8(5.3%), respondents reported promotion of antibiotics use in the management of acute diarrhoeal disease in this study. This is at variance with a study carried out in Enugu, Nigeria, to determine the knowledge attitude and practice of ORT among private medical practitioners, which showed that, though they were aware of ORT, there was still a high rate of inappropriate medicine use and a deficiency in in-depth knowledge and practice of ORT.[27] A similar study done in the northern part of Nigeria showed a vast difference between what pharmacists and medicine sellers claimed they did and their actual practice. The study revealed that almost all the respondents recommended medicines only, although fewer than 29% reported doing so. It was noted that more pharmacists (85%) recommended antibiotics, antimicrobials, adsorbents and antispasmodics alone or in combination with ORT. The decision to treat acute diarrhea with antimicrobial therapy should be made on patient by patient basis, after investigations. The reason for low antibiotic use among primary health care workers in our study could be explained on the basis of workshop training objectives which de-emphasized antibiotic use among this cadre of health workers.

The finding of a correlation between knowledge and promotion of practice of diarrhoeal control is consistent with other studies. Higher knowledge levels have been shown to be associated with promotion of hand washing practices[28] and lower incidence of diarrhoea.[29] However, this result is inconsistent with earlier studies done in Thailand[30], Midi-Pyrénées region[31], Pakistan[32] and other parts of Nigeria.[26],[27] which reported a discrepancy between knowledge and actual practice in evaluation of diarrhoeal control. A Trinidad study of the management of acute diarrhea by community pharmacists revealed that proper management was done more in children (68.4%) than in adults (44.1%).[33] In evaluation, 92.6% enquired about duration of diarrhea, consistency of stool, frequency of stooling and presence of mucus and blood in stool. This could have been a direct result of the knowledge acquired from a booklet published by World Health Organization titled 'Treatment of Acute Diarrhea- Information for Pharmacists' and distributed to all pharmacies in Trinidad. The booklet emphasized the promotion of the use of oral rehydration therapy by pharmacists.[26]

The correlation we observed in our study between older married providers, childbirth and promotion of practice of diarrhoeal control is consistent with the literature. In rural Uganda, Isingoma et al demonstrated that younger mothers lack nutritional knowledge for young children.[34] Similarly, in Iran, caregiver knowledge of diarrhea in children under 5 years of age has been shown to have significantly increased in older caregivers.[35] The explanation for the result in our study could be that the personal experiences of the providers as caregivers would have enriched their knowledge from training as health care workers to enhance their promotion of practice of acute diarrhoeal control.

There are some limitations to this study. First, there may be recall bias when respondents were giving responses. Their responses were not corroborated with medical records or other sources. Second, there may be response bias especially when answering questions about specific promotion of practice of diarrhoeal control. It is possible that they answered in a way that they thought they should respond because they were being watched based on previous education they had received, not how they actually behave ( Hawthorne effect). Third, this study was cross sectional; therefore, it is not amenable to cause-effect relationship. One cannot aver that the high knowledge and practice scores were solely due to the workshop training. Finally; Interviewing and administering questionnaire appear not to be reliable ways to measure professional prescribing behavior. Observation of actual practice or review of prescribing records is essential.

## **5. CONCLUSION**

In this study, we found that most health care workers in the eligible facilities had good knowledge of diarrhoea and promote practice of diarrhoea control. Their knowledge base was enhanced through regularly organized training workshops. The study also showed that diarrhoea prevention knowledge was positively correlated with higher promotion of practice of diarrhoea control overall scores. That diarrhoea remains a leading cause of death among children around the

world, particularly in the low and medium income countries, underscores the urgency of reinvigorating efforts to strengthen primary health care facilities and improve human resource development. This study highlights the importance of health care provider training and identifies a need to extend training to other primary health care facilities not captured in the new paradigm of Primary health care under one roof and basic health care provision fund of the Federal Government. With more facilities effectively managing diarrhoeal diseases through improved staff training, deaths and complications arising from diarrhoea will be mitigated.

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#### CONFLICT OF INTEREST

The authors declare no conflict of interest.

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