

ASSESSING THE CAPACITY OF COMMUNITY HEALTH WORKERS ON THE CURRENT MANAGEMENT OF CHILDHOOD DIARRHEA IN JIGAWA STATE, NIGERIA.

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Abstract

Background: Even though the lives of an estimated three quarters of a million children are being saved each year, over three million children are still dying from readily preventable diarrheal disease and this may partly be due to insufficient knowledge and skills by the healthcare provider to make diagnosis, provide appropriate care and take give major home key messages.

Methods: The study was descriptive cross sectional involving all the Primary Health Care centers in six LGAs of Jigawa State in January 2013. Two health workers from each PHC were assessed using a pre-test self-administered questionnaire. Data was analyzed using SPSS 16.0.

Results: Among 335 interviewed Community health workers, 54.9% were CHOS/CHEWS, 22.1% JCHEWS, 5.7% nurses and others (EHA, CA etc) made up 17.3%. Correct definition, types and key messages of diarrhea was known by 50%. In practice 48% would give an antibiotic combination with ORS. 30% constituted Salt sugar Solution correctly and about 20% would add zinc tablet as an adjunct therapy. Across individuals educational cadre, there was no statistical difference in knowledge and practices in management of diarrhea except in classification of dehydration ($p=0.00$) where CHO/CHEWS performed better and composition of Low ORS ($p=0.00$) were nurses responded better.

Conclusion: The identified gap in this study among these healthcare providers in managing childhood diarrhea at the community is a clarion call for immediate action to improve their knowledge and practice capacity at all levels through series or training and continuous retraining.

Key words: Diarrhea, knowledge, practices, zinc Low osmolarity ORS, health workers

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Introduction

Even though the lives of an estimated three quarters of a million children are being saved each year, over three million children are still dying from readily preventable diarrheal disease.¹ Integrated Management of Childhood Illnesses (IMCI) is a strategy formulated by the World Health organization (WHO) and United Nations Children's Fund (UNICEF) in 1996 that integrates all available measures for disease prevention and health problems during childhood, for early detection and effective treatment.² This strategy is carried out in three ways through improving health workers performance for prevention and treatment of childhood disease such as diarrhea, malaria, pneumonia, organization and operation of health services and involvement of family and community care practices (C-IMCI).

Community health workers are the building block of any health system bringing health services to villages across developing countries and the backbone of the Primary Health Care system in Nigeria. Travis et al⁷ showed that the health system

in many developing countries is too weak and fragile to scale up essential infant and childhood intervention. Various factors may be a challenge however one of the major challenges is the capacity of health care providers to appropriately provide these interventions. Today only 44% of children who have diarrhea receive appropriate assessment and management by a health care giver.³

Diarrhoea which is defined as the passage of three or more loose or liquid stools in a 24 hour period is caused by viruses, bacteria, parasite and fungus with malnutrition and poor hygienic practices being risk factors for its development.^{3,4} In May 2004, WHO and UNICEF issued a joint statement that two life saving but simple interventions could decrease diarrhea associated death; zinc supplementation and Low Osmolarity ORS.⁴ ORT is a simple, cheap and effective method which can be easily taught by knowledgeable health workers to child caregivers. The previous standard ORS used has reduced mortality from diarrhea but not reduce the duration that children suffer from diarrhea resulting in mothers and caregivers using

Antibiotics and other antidiarrhea drugs. However with the introduction of the new low osmolarity ORS, the duration of loose stool decreases by and with zinc supplementation as an adjunct therapy it been shown to decrease the severity and duration of the current episode of diarrhea and prevent reoccurrence in the next 2 to 3 months.⁵

In order to target mother's confusion and lack of understanding about how to recognize diarrhea and its danger signs, the importance of ORT, crucial need for immediate oral fluid replacement with low osmolarity ORS and zinc tablets, correct preparation of home-made sugar salt solution, when to use it and how to use it and when to return when danger signs are lurking, she must come in contact with a community health worker who is equipped with this information.⁶ The correct knowledge and treatment of diarrhea is one of the most powerful tools to reduce mortality.

Over the years the WHO/UNICEF programs recognized that to improve management of diarrhea, health providers should be educated.³ However, a one time off training is not enough. Thus it is timely to assess capacity of community health workers on the current home management of childhood diseases.

Subjects and Methods:

This was a descriptive cross sectional study involving six LGA'S (Dutse, Gumel, Babura, Kafin Hausa, Miga and Buji) in Jigawa State and carried out in January 2013. Two health workers each from 201 facilities were assessed using a pre-tested self administered questionnaire. Jigawa is located in the North Western region of Nigeria. State projected population from 2006 census at an annual increase of 3% is 5,026,617 with the under five population of 1,005,323. It is a sahelian state with 27 LGAs and shares border with Niger Republic. According to NDHS 2008, the diarrhea prevalence is 34.9%. Statistical analysis was done using SPSS version 16.0. Pearson's chi square and Fischer's exact test was used to test association between categorical variables. Data was represented in tables as frequencies and percentages. Statistical significance was set at $p < 0.05$.

Results

Of 402 health professionals, 335 completed the questionnaires (83.8%). Females were 89 and males 246 giving a F: M ratio of 1:2.7. Years of care of under fives ranged from 1 to 33 with a mean of 10.31 ± 6.48 years. One hundred and ninety one (57.0%) of them had been caring for under five for

less than 10 years, while 144 (43.3%) more than 10 years. Senior Community health extension workers (CHEWs) and Community health Officers (CHOs) constituted 54.9%, Junior CHEW, 22.1%, nurses 5.7% and others like Clinical Assistants, Environmental health assistants made up 17.3% (Fig 1).

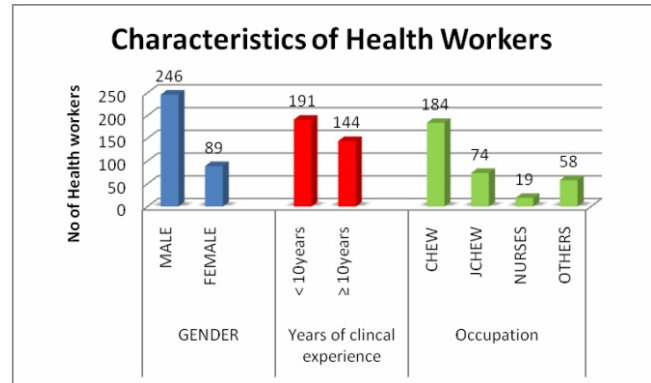


Fig1: Characteristics of health workers interviewed

Clinically defined diarrhea according to WHO of ≥ 3 or more liquid/loose watery stool in a 24 hour period was correct in 52.8% of the workers and incorrect in 46.6%. However, 57.6% were able to give the different types of diarrhoea as acute watery, acute bloody (dysentery) and persistent diarrhoea. Specific organisms such as viruses, bacteria, parasites and fungus were stated as causes of diarrhea in only 18.8% with 55.8% attributing causes to conaminations, poor hygienic practices and poor breastfeeding beliefs. However, 22.1% either did not know the causes or gave an incorrect answer (Table 1).

Two or more complications associated with diarrhea were correctly stated by 157 (46.9%) health professionals, 9% gave incorrect complications and 12.2% did not know any complication resulting from diarrhoea in under fives. In assessing dehydration, a major complication of diarrhea, only 23.3% correctly classified dehydration into no (or mild), some (or moderate) and severe dehydration with 40.3% not able to classify dehydration at all. The composition of new Low Osmolarity ORS is known by only 18 (5.4%) of the health workers. A significant number were able to give at least one correct take home key message on home management of diarrhea, 189 (56.4%) with 46 (13.7%) of them able to give two or more correct key messages.

Practices in managing diarrhea represented in Table 2 shows that 47.2% of the health workers would use antibiotics to treat diarrhea.

Table 1: Knowledge of Community Health workers on Diarrhea

A). Knowledge assessment	Frequency (n=335)	Percentage (%)
Definition of diarrhea		
Correct	177	52.8
Incorrect	156	46.6
Don't know	2	0.6
Types of diarrhea		
Correct	193	57.6
Incorrect	62	18.5
Don't know	80	23.9
Causes of diarrhea		
Specific infectious organisms	63	18.8
Contamination/Poor hygienic practice	187	55.8
Both infectious and poor practices	11	3.3
Incorrect	29	8.7
Don't know	45	13.4
Known complications of diarrhea		
One complication	107	31.9
Two or more complication	157	46.9
Incorrect	30	9.0
Don't know	41	12.2
Classification of dehydration		
<3 categories	42	12.5
3 categories	78	23.3
Incorrect	80	23.9
Don't know	135	40.3
Composition of LoORS		
Correct	19	5.7
Incorrect	118	35.2
Don't know	198	59.1
Key messages on home management of diarrhea		
One message	143	42.7
Two or more messages	46	13.7
Incorrect	96	28.7

Among those using antibiotics metronidazole(41.1%)was the commonest mentioned (not shown).Sixty percent and 63 % of the health workers did not know the dose nor the duration of Zinc tablets to be used with only 23.6% and 20.6 % knowing either the dose or duration of zinc use respectively. Correct zinc dosage and duration of intake for 10 days was seen in only 57 (17.1%).

Table 3 shows the relationship between the educational statuses of these health workers and their knowledge about childhood diarrhea. There was no statistical significant association between the individual's current educational status and the definition of diarrhea ($p=0.13$),types of diarrhea ($p=0.34$),causes($p=0.07$),complications($p=0.06$), and number of key messages known($p=0.30$).However, correct knowledge of composition of Low osmolarity ORS was highest among the nurses and this was of statistical significance ($\chi^2=143.42,df=6, p=0.00$) and more CHOs and senior CHEW were able to properly classify dehydration into one or more categories($\chi^2=56.69, df=6, p=0.00$).

Table 2: Practices of community health workers

Practices	Frequency (n=335)	Percentage (%)
Treatment for diarrhea		
ORS+Antibiotics based combinations	158	47.2
ORS/SSS only	56	16.9
LoORS+Zinc tablets	46	13.7
Zinc Tabs only	24	7.2
Other drugs	1	0.3
Antidiarrheas (diastop,loperamide etc)	50	14.9
Dosage of Zinc Tablets		
Correct	79	23.6
Incorrect	54	16.1
Don't know	202	60.3
Duration for Zinc tabs ingestion		
Correct	69	20.6
Incorrect	55	16.4
Don't know	211	63.0
Constitution of Salt Sugar Solution		
Correct	103	30.7
Incorrect	136	40.6
Don't know	96	28.7

Table3: Knowledge related to educational status of community health workers

Knowledge parameters	Highest educational status n(%)				χ ²	df	P
	CHO/CHEW n= 184 (%)	JCHEW n =74 (%)	Nurses n=19(%)	Others n=58(%)			
Definition of diarrhea							
Correct	99(53.8)	39(52.7)	8(42.1)	31(53.4)			
Incorrect	85(46.2)	34(45.9)	10(52.6)	27(46.6)	9.6	6	0.13
Don't know	0(0.0)	1(1.4)	1(5.3)	0(0.0)			
Types of diarrhea							
Correct	104(56.5)	46(62.2)	9(47.4)	34(58.6)			
Incorrect	30(16.3)	13(17.6)	7(36.8)	12(20.7)	6.78	6	0.34
Don't know	50(27.2)	15(20.3)	3(15.8)	12(20.7)			
Causes of diarrhea							
Specific infectious organisms	30(16.3)	16(21.6)	4(21.1)	13(22.8)			
Contamination /Poor hygienic practices	107(58.2)	36(48.6)	12(63.2)	32(56.1)			
Both infectious and poor practices	6(3.3)	1(1.4)	0(0.0)	4(7.0)			
Incorrect	11(37.9)	12(16.2)	3(15.8)	3(5.3)			
Don't know	30(68.2)	9(12.2)	0(0.0)	5(8.8)	19.3	12	0.07
Known complications of diarrhea							
One complication	57(53.3)	21(19.6)	5(4.7)	24(22.4)			
≥2 complications	93(59.2)	28(17.8)	10(6.4)	26(16.6)			
Incorrect	15(50.0)	8(26.7)	2(6.7)	5(16.7)			
Don't know	19(47.5)	17(42.5)	2(5.0)	2(5.0)	16.14	9	0.06
Classification of dehydration							
<3 categories	92(50.0)	12(16.2)	2(10.5)	9(15.5)			
3 categories	44(23.9)	14(18.9)	9(47.4)	16(27.6)			
Incorrect	48(26.1)	48(64.9)	8(42.1)	33(56.9)	59.69	6	0.00*
Composition of LoORS							
Correct	3(1.6)	1(1.4)	12(63.2)	3(5.2)			
Incorrect	61(33.2)	22(29.7)	5(26.3)	30(51.7)			
Don't know	120(65.2)	51(68.9)	2(10.5)	25(50.0)	143.42	6	0.00*
Key messages on home management of diarrhea							
One message	79(42.9)	32(43.8)	9(47.4)	23(40.4)			
Two or more messages	27(14.7)	4(5.5)	3(15.8)	12(21.1)			
Incorrect	50(27.2)	26(35.6)	3(15.8)	17(29.8)			
Don't know	28(15.2)	11(15.1)	4(21.1)	5(8.8)	10.60	9	0.30

*statistically significant

In table 4, irrespective of the educational status over 40% would give an antibiotic combination to treat diarrhea. More Nurses gave low osmolarity ORS and Zinc then CHOs and CHEWS, while the least group to give low osmolarity ORS and Zinc or Zinc tablets alone were the Junior CHEWs. No statistical significance was seen ($p=0.14$).No significant difference in practice of zinc tablets given in terms of dosage ($p=0.09$) or duration ($p=0.06$) and constitution of SSS by education($p=.0.36$).

Table4: Educational status related to practices of community health workers

Practices parameters	Highest Educational status n(%)				χ ²	df	P
	CHO/CHEW n= 184 (%)	JCHEW n =74 (%)	Nurses n=19(%)	Others n=58(%)			
Treatment for diarrhea							
ORS+ Antibiotics based combinations	89(48.4)	36(48.6)	10(52.6)	23(40.4)			
ORS/SSS only	28(15.2)	16(21.6)	1(5.3)	11(19.3)			
LoORS+Zinc tablets	28(15.2)	3(4.1)	4(21.1)	11(19.3)			
Zinc Tabs only	16(8.7)	2(2.7)	2(10.5)	4(7.0)			
Other drugs	0(0.0)	1(1.4)	0(0.0)	0(0.0)			
Ant diarrhea (diastop,loperamide etc)	23(12.5)	16(21.6)	2(10.5)	8(14.0)	20.86	15	0.14
Dosage of Zinc Tablets							
Correct	39(21.2)	13(17.6)	5(26.3)	22(38.6)			
Incorrect	32(17.4)	10(13.5)	4(21.1)	8(14.0)			
Don't know	113(61.4)	51(69.0)	10(52.6)	27(47.4)	10.7	6	0.09
Duration of Zinc tabs ingestion							
Correct	36(19.6)	10(13.5)	4(21.1)	19(33.3)			
Incorrect	29(15.8)	10(13.5)	5(26.3)	11(19.3)			
Don't know	119(64.7)	54(73.0)	10(52.6)	27(47.4)	12.00	6	0.06
Constitution of Salt Sugar Solution							
Correct	59(32.1)	16(20.6)	6(31.6)	22(38.6)			
Incorrect	76(41.3)	30(40.5)	8(42.1)	22(38.6)			
Don't know	49(26.6)	28(37.8)	5(26.3)	13(22.8)	6.50	6	0.36

Discussion

The result of this study indicates that community health workers in Jigawa state have identifiable gaps in their knowledge and skills in managing diarrhea in children less than five years. Nearly half (46.6%) of them may fail to recognize early, the episodes of diarrhea. Ande et al⁸ in Oyo Nigeria among Village health workers noted that only 22% VHWs and 21% of TBAs also gave a correct account of the major way to recognize diarrhea.

Studies have shown that diarrhea is mainly caused by viruses and few non-invasive bacteria and treatment with fluids alone rather than medications would improve the outcome.^{9,10} The inability of the community health workers to identify that most childhood diarrheas are viral in nature is probably the reason why many are known to give antibiotics even when specific signs (bloody diarrhea) and systemic illness were not reported. This practice is clearly seen in the response of the participants in this study on how they treat diarrhea, with over 40% of them admitting to prescribing antibiotics along with ORS. A significant number these health workers use anti diarrheals such as diastop, loperamide and kaolin across all cadres of care (14.9%). These are contraindicated in children due to their toxicities.^{9,12}

Similarly, Okora and Jones¹¹ reported in Nigeria that the prescribing patterns in childhood diarrhea revealed oral fluids (100%), antimicrobials (40.3%) anti- protozoals (24.6%) and anti-diarrhoeals. The duration of most diarrheas are mild self-limiting and this frequent use of antimicrobial would lead to increased cost, drug resistance and worsening of the diarrhea through antimicrobial side effect

The main goal in the management of acute diarrhea is to prevent dehydration (if there are no signs of dehydration) or treat it when signs are present. This can be achieved with the oral rehydration therapy. More nurses (48%) are able to correctly classify dehydration compared to CHEWS and JCHEWS. In all cultures, treatment of diarrhea begins at home and many make homemade solutions like salt sugar solution (SSS) however, serious errors can occur resulting in worsening of the diarrhea and death if the mothers are not taught how to properly constitute the SSS. Most mothers are taught how to constitute home fluids by frontline health personnel. Only between 20 to 30% of community health workers in this study were able to properly constitute the SSS. In view of this WHO recommends encouraging families to have a supply of LoORS at home at all times.^{3,4} Early administration of ORS leads to fewer emergency visits, lower hospitalization and deaths.^{13,14}

In 1975 WHO and UNICEF agreed to promote a single ORS containing (in mmol/L) Sodium 90,potassium 20,chloride,80,base30, glucose 111 and a total osmolarity of 311mOsmol/L which has been used for over 25 years. It has been safe and effective for rehydration however has not significantly reduced stool volume and duration. Subsequent clinical research supported an adoption of a reduced osmolarity ORS in May 2002 by WHO with decreased sodium (75mmol/L),glucose (75mmol/L) and osmolarity of 245 mOsm/L that has been associated with less volume, less stool output and reduced need for unscheduled intravenous fluid when compared with the standard ORS.⁵ Zinc supplementation is a critical new intervention for treating diarrheal episodes in children. Recent studies suggest that administration of zinc along with new low osmolarity oral rehydration solutions / salts (ORS) can reduce the duration and severity of diarrheal episodes for up to three months. The World Health Organization (WHO) and UNICEF recommend daily 20 mg zinc supplements for 10-14 days for children with acute diarrhea, and 10 mg per day for infants under six months old. Many countries have changed diarrhea management policies to include low osmolarity ORS and zinc, but there is a gap between policy change and effective program implementation such as capacity building of health workers, with very few children currently being appropriately treated.

The WHO states that quality training of community health workers has the potential to accelerate uptake, ensure zinc is used correctly, increase Low ORS use, decrease unnecessary antibiotic use, increase referrals and thus decrease morbidity and mortality.³ Flores et al¹⁵ showed that distance learning with tutoring improves some aspect of diarrhea case management in frontline health workers in Guatemala. Community health workers such as the JCHEW, CHEW, CHO and nurses are the frontline practitioners who come in contact with the caregivers and children on daily basis at the community level and need to receive periodic trainings and supervision on child hood illnesses like diarrhea.

Conclusion:

In order to achieve the Millennium development goals 4 and 6 by 2015, there is an urgent need to revitalize, maintain and enhance the skills of community-health workers in assessing and managing children with diarrhea through periodic re-fresher and update courses.

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