

Knowledge of prescription of zinc and low-osmolarity ORS for under-five children with diarrhoea by Primary Healthcare Workers in Ibadan, Nigeria

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Abstract

Background: Zinc supplement plus Low Oral Rehydration Salt (Zn+Lo-ORS) solution has been recommended for the management of acute diarrhoea. Studies have shown that it has the potential to reduce diarrhoea-related mortality by up to 88%. Nigeria has adopted the recommended diarrhoeal management policies and although, it is not known how many children with diarrhoea access Lo-ORS, the proportion of children who received zinc supplementation increased from less than 1% in 2008 to over 2% in 2013. Majority of diarrhoea patients in Nigeria are treated with antibiotics by Primary Healthcare Workers (PHCWs) who are the first line of contact for many of these children. However, little is known about the level of knowledge of Zn+LoORS by the PHCWs and their knowledge of prescription of Zn+Lo-ORS, in Ibadan.

Objectives: The objective was to assess the level of knowledge of Zn+Lo-ORS and of its prescription, for under-five children with diarrhoea amongst PHCWs in Ibadan. Factors associated with the level of knowledge of Zn+Lo-ORS and of prescription of Zn+Lo-ORS were also determined.

Subjects and methods: This was a descriptive cross-sectional study among PHCWs in five local government areas of Ibadan. Information from 200 PHCWs, selected via a three-stage sampling technique, was obtained using a self-administered questionnaire. Descriptive statistics, Chi-square and logistic regression tests were utilized in analysing quantitative data with the level of significance set at $P < 0.05$.

Results: The PHCWs were from seven cadres, mean age 40.6 ± 9.90 years, 191 (95.5%) females, and 85 (42.5%) had been on the job for 16-20 years. Only 69.5% had good knowledge of Zn+Lo-ORS and 51.3% had knowledge of correct prescription of Zn+Lo-ORS for the treatment of childhood diarrhoea. Chi-square tests revealed significant association

between respondents' cadre and knowledge of Zn+Lo-ORS ($\chi^2 = 19.33, P < 0.001$); and knowledge of prescription of Zn+Lo-ORS ($\chi^2 = 18.63, P < 0.001$). PHCWs with 1-5 years of working experience were more likely to have good knowledge (OR = 1.65; 95% CI = 0.46-5.84) and those with 6-10 years of working experience were more likely to prescribe (OR = 1.95; 95% CI = 0.78-4.84) Zn+Lo-ORS compared to 16-20 years. Midwives were more likely to have good knowledge (OR = 10.20; 95% CI = 1.75-59.36) and more likely to prescribe (OR = 22.14; 95% CI = 2.35-208.15) Zn+Lo-ORS compared to other cadres of PHCW.

Conclusion/Recommendation: The primary health care workers' level of knowledge and prescription of zinc and Lo-ORS for childhood diarrhoea was sub-optimal. Primary health care workers should be trained periodically on current management guidelines.

Keywords: *Low Osmolarity Oral Rehydration Solution, Zinc, Under-five Children, Diarrhoea, prescription*

Résumé

Contexte : Un supplément de zinc et une solution de sel de réhydratation orale à faible teneur (Zn+Lo-ORS) ont été recommandés pour la prise en charge de la diarrhée aiguë. Des études ont montré qu'il a le potentiel de réduire la mortalité liée à la diarrhée jusqu'à 88 %. Le Nigeria a adopté les politiques de gestion de la diarrhée recommandées et bien que l'on ne sache pas combien d'enfants souffrant de diarrhée ont accès au Lo-ORS, la proportion d'enfants ayant reçu une supplémentation en zinc est passée de moins de 1 % en 2008 à plus de 2 % en 2013. La majorité des patients atteints de diarrhée au Nigeria sont traités avec des antibiotiques par les agents de santé primaires (PHCW) qui sont la première ligne de contact pour bon nombre de ces enfants. Cependant, on sait peu de choses sur le niveau de connaissance du Zn+LoORS par les PHCW et leur connaissance de la prescription de Zn+Lo-ORS, à Ibadan. Objectifs : L'objectif était d'évaluer le niveau de connaissance du Zn+Lo-ORS et de sa prescription, chez les enfants de moins de cinq ans souffrant de diarrhée chez les PHSC à Ibadan. Des facteurs associés au niveau de connaissance de Zn+Lo-ORS et de prescription de Zn+Lo-ORS ont également été déterminés.

Sujets et méthodes : Il s'agissait d'une étude transversale descriptive parmi les PHCW dans cinq zones de gouvernement local d'Ibadan. Les informations de 200 FSSP, sélectionnés via une technique d'échantillonnage à trois degrés, ont été obtenues à l'aide d'un questionnaire auto-administré. Des statistiques descriptives, des tests du Chi carré et de régression logistique ont été utilisés pour analyser les données quantitatives avec un niveau de signification défini à $P < 0,05$. Résultats: Les PHCW appartenaient à sept cadres, âgés en moyenne de $40,6 \pm 9,90$ ans, 191 (95,5%) femmes et 85 (42,5%) étaient en poste depuis 16-20 ans. Seuls 69,5% avaient une bonne connaissance de Zn+Lo-ORS et 51,3% avaient une connaissance de la prescription correcte de Zn+Lo-ORS pour le traitement de la diarrhée infantile. Les tests du chi carré ont révélé une association significative entre le cadre des répondants et la connaissance de Zn + Lo-ORS ($X^2 = 19,33$, $P < 0,001$) ; et connaissance de la prescription de Zn+Lo-ORS ($X^2 = 18,63$, $P < 0,001$). Les professionnels de la santé avec 1 à 5 ans d'expérience de travail étaient plus susceptibles d'avoir de bonnes connaissances (OR = 1,65 ; IC à 95 % = 0,46 à 5,84) et ceux ayant 6 à 10 ans d'expérience de travail étaient plus susceptibles de prescrire (OR = 1,95 ; 95 % IC = 0,78-4,84) Zn+Lo-ORS par rapport à 16-20 ans. Les sages-femmes étaient plus susceptibles d'avoir de bonnes connaissances (OR = 10,20 ; IC à 95 % = 1,75-59,36) et plus susceptibles de prescrire (OR = 22,14 ; IC à 95 % = 2,35 à 208,15) Zn+Lo-ORS par rapport aux autres cadres des SSP.

Conclusion/Recommandation : Le niveau de connaissance des agents de santé primaires et la prescription de zinc et de Lo-ORS pour la diarrhée infantile étaient sous-optimaux. Les agents de soins de santé primaires doivent être formés périodiquement sur les directives de prise en charge actuelles.

Mots clés : *Solution de réhydratation orale à faible osmolarité, Zinc, Enfants de moins de cinq ans, Diarrhée, prescription*

Introduction

Diarrhoea is the passage of three or more loose stools per day (or more frequent passage than is normal for the individual) [1]. The frequent passage of formed stools is not diarrhoea, nor is the passing of loose "pasty" stools by breastfed babies [1,2]. Diarrhoeal illnesses account for about 4.6 million deaths from about 1 billion episodes of diarrhoea every year in children younger than 5 years [3,4].

Oral rehydration solution (ORS) is the 'gold standard' for the management of diarrhoea. In 1969, ORS was first utilized and then appropriated by UNICEF and WHO as the non-marked name for a fair glucose-electrolyte blend presented as a medication for the treatment of dehydration

universally. It was modified in 1984 to improve its stability in hot and humid atmospheres [5]. The modification provided a solution containing 90 mEq/l of sodium with a total osmolarity of 311 mOsm/l and was verified effective without adverse effects [5,6]. In May 2004, WHO and UNICEF endorsed and recommended a lower osmolarity ORS formulation with the introduction of zinc supplementation as a new intervention for the management of diarrhoea [5]. In 2005 zinc was added to WHO's Essential Medicines List, urging nations to include zinc in their national drugs records and well-being spending plans. [5,6]. At that time, the new low osmolarity solution had contributed considerably to the marked global reduction in mortality from diarrhoea [7]. The reduction in osmolarity of the solution was to make it safe and effective for the prevention or treatment of dehydration from all types of diarrhoea by reducing stool output and possible adverse effects of hypertonicity on net fluid absorption [5,7,8]. To reduce ORS osmolarity, the concentration of glucose and salt (NaCl) was decreased to a sodium concentration of 75 mEq/l, glucose concentration of 75 mmol/l, and a total osmolarity to 245 mOsm/l [7]. This recent formulation is now referred to as low-osmolarity oral rehydrated salt (Lo-ORS). Lo-ORS improves overall health outcomes when compared to the previous standard ORS.

The World Health Organization and United Nations Children's Fund (UNICEF) currently recommends the use of a combination of Lo-ORS and Zinc (Zn + Lo-ORS) for the management of diarrhoea and that all children with diarrhoea have access to the new Lo-ORS formula [4,9,10]. Lo-ORS reduces stool output, shortens the duration of diarrhoea, and also reduces the need for intravenous fluids.

Zinc has been associated with a reduction in the severity and the duration of an episode of diarrhoea as well as the likelihood of infections for the next 2-3 months [7,11]. Zinc shows a significant role in modulating host resistance to infectious agents and reducing the severity, duration, and risk of diarrhoeal diseases [1,12]. Zinc is critical for health in low-income and middle-income countries, in the developing world, where mild-to-moderate zinc deficiency is highly prevalent [12,13]. However, the proportion of children with diarrhoea who received zinc supplementation increased from less than 1 percent in 2008 to just over 2 percent in 2013 [14]. This small increase falls far short of the UNICEF and WHO recommendations [1,3,6].

It is widely known that breastfeeding for the first 24 months of life or beyond including exclusive breastfeeding (EBF) in the first 6 months is essential for the health of under-five children [15]. It has been

documented that improved breastfeeding among other interventions such as therapy with ORS and the administration of zinc has led to a reduction in diarrhoea mortality from approximately 4.5 million deaths in the 1980s to 1.3 million in 2008 [16,17]. It therefore becomes imperative that children with diarrhoea be managed with Lo-ORS + Zinc at healthcare facilities, one of the major places via which children with diarrhoea present. The healthcare workers in these facilities need to have the knowledge about Lo-ORS +Zinc and its prescription.

Few studies have indicated that quality training of health-care workers will facilitate the appropriate prescription of Lo-ORS and zinc [7,18,19]. In Nigeria, a study conducted in one of the southern states highlighted practices of health-care workers in both primary and secondary health facilities on case-file information from under-five children case records and found the appropriate prescription of Lo-ORS and Zinc according to the current WHO and UNICEF treatment guidelines for diarrhoea; the prescription was only 10.8% of the 370 case records audited [20].

Also, in an on-site assessment of primary health-care workers in a state in north-western Nigeria, 13.7% of 335 community health workers appropriately treated and managed children with Lo-ORS + Zinc tablets while the majority prescribed ORS plus antibiotics based combination [21]. Furthermore, a study conducted in another southern state in Nigeria determined the level of information and utilisation of only zinc supplementation in the management of childhood diarrhoea among 168 health care workers in public primary health care facilities [16].

In the study, thirty-five percent of the health care workers (HCWs) recommended zinc while overseeing childhood diarrhoea [16]. About 84.6% of 168 HCWs prescribed the appropriate dose of zinc while not exactly 50% of them recommend it for the appropriate duration. All except one of the HCWs prescribed zinc notwithstanding ORS following the WHO guideline [16]. Hence, the knowledge of zinc supplementation in the administration of childhood acute diarrhoea was poor among the health care workers [22]. Many cases are treated with antibiotics and other drugs [18,20,23]

The use of Lo-ORS and zinc is an essential tool for the management of children with diarrhoea by healthcare workers especially PHCWs who are usually the first line health care workers with whom the children have contact at the community level. To our knowledge, this is the first study in which the level of knowledge of Zn+Lo-ORS and its knowledge of prescription for under-five children among primary health care workers in Ibadan, Nigeria was assessed.

Methods

Study design

The study design was a descriptive cross-sectional study.

Study area

Ibadan is the capital of Oyo state and is the third-largest city in Nigeria by population (after Lagos and Kano) with a population of 306,79, and the largest by geographical area, covering an area of 128 km² [24]. It is located in south-western Nigeria. The principal inhabitants of the city are the Yoruba-speaking people and minority of ethnic groups. They are mainly traders and artisans. This capital state houses the first academic institution in Nigeria- the University of Ibadan. There are 11 local government areas and about 124 wards in Ibadan [25].

This study was conducted in five Local Government Areas (LGAs) in Ibadan. The LGAs were Ibadan North East, Ibadan South East, Ibadan South West, Egbeda and Lagelu. The health structure in Oyo State is adopted from the minimum standards for Primary Health Care in Nigeria by the National Primary Health Care Development Agency [26]. The types of health facilities in Oyo state are one Tertiary (Tertiary) Hospital, one General Hospital per LGA, one Primary Health Centre per ward, one Primary Health Clinic per group of villages or neighbourhoods with about 2000 – 5000 persons and one Health Post per village or neighbourhood of about 500 persons [26].

Study participants

The study population was made up of healthcare workers working in the Primary health care facilities across five local government areas in Ibadan. They were Nurses, Health Assistance, Community Health Officers (CHOs), Community Health Extension Workers (CHEWS) because they are the predominant health workers in the Primary Health Centres (PHCs). There are about 248 PHCs and 923 health workers in Ibadan with an average of four health workers in each PHC [27].

Sampling technique

A multistage sampling technique was used to select the study participants. In the first stage, five out of the 11 local government areas (LGAs) in Ibadan were selected using a simple random sampling technique. In the second stage, 10 PHCs were selected from each of the five selected LGAs by a simple random sampling method using the list of primary healthcare facilities obtained from the District Health Information Department of the Oyo State Ministry of Health as the sampling frame. In the third stage, the average

of PHCWs was selected from each of the PHCs in the five selected local government areas from the staff attendance book by simple random sampling. The estimated sample size was 202. The sample size was calculated with a prevalence of 13.7% of appropriate prescription of current WHO and UNICEF treatment recommended for diarrhoea, using the study by Abdu et al on "Facility-Based Treatment of Under-five Diarrhoea in Cross River State, Nigeria" [21]. A precision of 5% with an allowance of 10% non-response rate was used.

Study instrument

Data collection instrument for the study was adapted from a study on Facility-Based Treatment of Under-five Diarrhoea in Cross River State, Nigeria, questionnaire format, conducted by Abdu et al [21]. This was modified following a pre-test at the Ibadan North Local Government Area of Ibadan.

Data collection

Data was collected using a self-administered, semi-structured interviewer assisted questionnaire. Data was collected by an investigator and a research assistant, the latter a university degree holder. The research assistant was trained over a period of two days on how to obtain informed consent, how to interact with the PHCWs and how to administer the instrument for data collection. The questionnaire was administered in both English and Yoruba language when necessary. Information was collected on socio-demographic characteristics of respondents (age, sex, category of healthcare worker, and years of practice) and level of knowledge and knowledge of prescription of zinc supplement and Lo-ORS by PHCWs. Cadre was categorized as health assistants/auxiliary nurse, senior community health extension worker, junior community health extension worker, nurse, midwife, community health officer, traditional birth attendants, voluntary health workers and health information officer. Knowledge was assessed on questions such as; knowledge on diarrhoea, knowledge of Zn+Lo-ORS and knowledge of prescription of Zn+Lo-ORS.

Study measures

Knowledge was assessed on questions such as; knowledge about old ORS, and knowledge about new ORS (Lo-ORS), knowledge of Lo-ORS concentration, knowledge of zinc supplementation, knowledge of the definition of diarrhoea, knowledge on types of diarrhoea (acute watery diarrhoea, acute bloody diarrhoea, persistent diarrhoea and diarrhoea with severe malnutrition), knowledge of causes of diarrhoea (specific infectious organisms, poor hygienic

practice, contamination), knowledge about dehydration and malnutrition as major complications of diarrhoea and knowledge about the level of dehydration as a consequence of diarrhoea. The prescription was assessed on questions such as; how would you treat a child with diarrhoea, zinc dose appropriate for a child younger than 6 months for 10 days, zinc dose appropriate for a child older than 6 months for 10 days, continuous ORS administration stops diarrhoea, exclusively breastfed child and ORS administration, ORS dose appropriate for a child under 2 years, and ORS dose appropriate for a child over 2 years.

Data analysis

For the quantitative data analysis, data were analysed by computer using the SPSS version 22. A simple proportion was calculated to determine the level of knowledge of zinc and Lo-ORS being categorized as "good and poor" knowledge. Each of the correct answers to the 15 questions on the knowledge of zinc and Lo-ORS for under-five children with diarrhoea was scored one point and the incorrect answer zero. The maximum obtainable score was 15 and the minimum zero. Participants who scored eight points and above were considered to have good knowledge while, those who scored less than eight were categorised as having poor knowledge. Prescription of zinc and Lo-ORS was also assessed by categorizing responses as "correct and incorrect" prescription. Seven questions were used to assess prescription; correct and incorrect answers were scored one and zero respectively. The maximum obtainable score for prescription was seven and the minimum zero with 4 as the average score.

Data were presented on tables and associations between categorical variables assessed using χ^2 tests and logistic regression analysis. And the level of significance was set at $P < 0.05$.

Ethical approval

Ethical approval was obtained from the Oyo State Ethical Review Committee, Department of Planning, Research and Statistics Division, Ministry of Health; and verbal informed consent was sought and obtained from the participants.

Results

Socio-demographic characteristics of respondents

A total of 202 questionnaires were distributed and 200 were returned for analysis giving a response rate of about 99.01%. Socio-demographic characteristics of respondents show the majority (141, 70.5%) of the respondents were older than 35 years of age while

those less than 25 years old were 18 (9.0%). The mean age of the respondents was 40.6 ± 9.9 years. Most (191, 95.5%) of the respondents were females. Few respondents, 30 (15.0%) had between 1 and 5 years of working experience (Table 1).

as one of the types of diarrhoea. Slightly more than half (52.5%) of the respondents knew specific infectious organisms that cause diarrhoea. Few of the respondents (17.0%) knew that dehydration and malnutrition are the major complications of diarrhoea.

Table 1: Socio-demographic characteristics of respondents

Variable (n=200)	Frequency	Percentage %
<i>Age (years)</i>		
<25	18	9.0
25-35	41	20.5
>35	141	70.5
<i>Sex</i>		
Male	9	4.5
Female	191	95.5
<i>Years of Work</i>		
1-5	30	15.0
6-10	40	20.0
11-15	45	22.5
16-20	85	42.5
<i>Cadre</i>		
Health Assistants/Auxiliary Nurse	26	13.0
Senior Community Health Extension Worker	64	32.0
Junior Community Health Extension Worker	22	11.0
Nurse	10	5.0
Midwife	31	15.5
Community Health officer	37	18.5
Others*	10	5.0

Knowledge about diarrhoea

More than eighty percent (81.0%) of the respondents poorly defined diarrhoea, while 19.0% defined diarrhoea correctly. Only 16% knew acute diarrhoea

More than half (98.0%) knew old ORS while 41.5% knew the new ORS (Lo-ORS). Only 2.5% knew zinc supplementation. The knowledge score showed

Table 2: Knowledge about diarrhoea

Items	Correct (%)	Incorrect (%)
Definition Diarrhoea	38 (19.0%)	162 (81.0%)
Definition of acute watery diarrhoea	32 (16.0%)	168 (84.0%)
Acute bloody diarrhoea as a type of diarrhoea.	131 (65.5%)	69 (34.5%)
Persistent diarrhoea as a type of diarrhoea.	84 (42.0%)	116 (58.0%)
Chronic diarrhoea as a type of diarrhoea	188 (94.0%)	12 (6.0%)
Diarrhoea with severe malnutrition as a type of diarrhoea.	119 (59.5%)	81 (40.5%)
Specific infectious organisms as part of the causes of diarrhoea.	105 (52.5%)	95 (47.5%)
Poor hygienic practice as one of the causes of diarrhoea.	46 (23.0%)	154 (77.0%)
Contamination as one of the causes of diarrhoea.	33 (16.5%)	167 (83.5)
Dehydration and malnutrition as major complications of diarrhoea.	34 (17.0%)	166 (83.0%)
Classification of dehydration	106 (53.0%)	94 (47.0%)
Knowledge about oral rehydration salt	196 (98.0%)	4 (2.0%)
Knowledge about the new oral rehydrated salt (Lo-ORS)	83 (41.5%)	117 (58.5%)
Knowledge about ORS with 311 mOsm/L	177 (88.5%)	23 (11.5%)
Knowledge about Zinc supplementation in the treatment of Diarrhoea?	5 (2.5%)	195 (97.5%)

that 69.5% of the respondents had good knowledge of the management of diarrhoea (Table 2).

Association between socio-demographic variables of respondents' and knowledge of zinc and Lo-ORS for the management of diarrhoea

The association between socio-demographic variables (age, gender, cadre, and years of experience) of respondents' and their knowledge of zinc and Lo-ORS was assessed using Chi-square tests with the level of significance set at 0.05. Findings showed that only the cadre of respondents' had a significant association with knowledge of zinc and Lo-ORS (Table 3).

than half (46.5%) of the respondents indicated the correct zinc dose for a child <6 months for 10days. Slightly more than half (51.0%) indicated the correct zinc dose for a child >6 months for 10 days. 96.0% indicated continuous giving of ORS until diarrhoea stops; while more than half (61.3%) showed ORS is appropriate for a child exclusively breastfed. Less than half (28.0%) indicated the ORS dose appropriate for a child <2 years. And only 32.0% highlighted the appropriate prescription for a child >2 years (Table 4).

Table 3: Association between socio-demographic variables of respondents' and knowledge of zinc and Lo-ORS

Variables	Good knowledge (n=139) Freq. (%)	Poor knowledge (n= 61) Freq. (%)	χ^2 - value	P-value
<i>Age (yrs)</i>			0.76	0.684
<25	11 (61.1%)	7 (38.9%)		
25-35	28 (68.3%)	13 (31.7%)		
>35	100 (70.9%)	41 (29.1%)		
<i>Gender</i>			1.000	
Male	6 (66.7%)	3 (33.3%)		
Female	133 (69.6%)	58 (30.4%)		
<i>Cadre</i>			19.33	<0.001
Health/Auxiliary nurse	15 (57.7%)	11 (42.3%)		
SCHEW* ¹	36 (56.3%)	28 (43.8%)		
JCHEW* ²	16 (72.7%)	6 (27.3%)		
Nurse	8 (80.0%)	2 (20.0%)		
Midwife	28 (90.3%)	3 (9.7%)		
CHO* ³	31 (83.8%)	6 (16.2%)		
Others*	5 (50.0%)	5 (50.0%)		
<i>Years of experience</i>			2.23	0.525
1-5	19 (63.3%)	11 (36.7%)		
6-10	28 (70.0%)	12 (30.0%)		
11-15	35 (77.8%)	10 (22.2%)		
16-20	57 (67.1%)	28 (32.9%)		

*¹ SCHEW- Senior Community Health Extension Worker

*²JCHEW- Junior Community Health Extension Worker

*³CHO- Community Health Officer

* include Traditional Birth Attendants, Voluntary Health workers, Health Information Officer

Knowledge of prescription of zinc and Lo-ORS for under-five children

The knowledge score indicated that only 51.3% of the respondents had the correct knowledge of prescription of zinc and Lo-ORS on the management of diarrhoea. As shown in table 4, More than half (68.5%) of the respondents would administer zinc plus Lo-ORS correctly to a child with diarrhoea. Less

Association between socio-demographic variables of respondents' and knowledge of prescription of zinc and Lo-ORS

There was no significant association between the knowledge of prescription of zinc and the socio-demographics ($P > 0.05$) except among cadre of health workers ($P < 0.05$). However, correct and incorrect knowledge of prescriptions tend to increase

Table 4: Knowledge of prescription of zinc and Lo-ORS for under-five children

Items on knowledge	Correct Knowledge of Prescription	Incorrect Knowledge of Prescription
Knowledge of appropriate prescription of Zn+Lo-ORS for an under-five child	137 (68.5%)	63 (31.5%)
Appropriate Zinc dosage for a child younger than 6 months	93 (46.5%)	107 (53.5%)
Appropriate Zinc dosage for a child older than 6 months	102 (51.0%)	98 (49.0%)
Duration of ORS administration for an episode of diarrhoea	192 (96.0%)	8 (4.0%)
Administration of ORS to an exclusively breast fed child	122 (61.3%)	77 (38.7%)
Appropriate dosage of ORS after each loose stool for a child under 2 years of age	56 (28.0%)	144 (72.0%)
Appropriate dosage of ORS after each loose stool for a child over 2 years of age	64 (32.0%)	136 (68.0%)

as age increased. There was no much difference in knowledge of prescription within gender and years of experience (Table 5). 95% CI= 0.16-2.51). Male respondents were less likely to be knowledgeable of Zn+Lo-ORS compared to females (OR= 0.75; 95% CI= 0.15-3.73).

Table 5: Association between socio-demographic variables of respondents' and knowledge of prescription of zinc and Lo-ORS

Characteristics	Correct knowledge of prescription (n= 102) Freq.	Incorrect knowledge of prescription (n= 97) Freq.	χ^2 - value	P-value
<i>Age</i>			2.01	0.366
<25	7 (38.9%)	11 (61.1%)		
25-35	19 (46.3%)	22 (53.7%)		
>35	76 (54.3%)	64 (45.7%)		
<i>Gender</i>			0.74	
Male	4 (44.4%)	5 (55.6%)		
Female	98 (51.6%)	92 (48.4%)		
<i>Cadre</i>			18.63	<0.001
Health assistance/Auxiliary Nurse	10 (38.5%)	16 (61.5%)		
SCHEW* ¹	30 (46.9%)	34 (53.1%)		
JCHEW* ²	9 (40.9%)	13 (59.1%)		
Nurse	6 (60.0%)	4 (40.0%)		
Midwife	23 (62.2%)	14 (37.8%)		
CHO* ³	23 (62.2%)	14 (37.8%)		
Others*	1 (11.1%)	8 (88.9%)		
<i>Years of practice</i>			3.82	0.281
1-5	11 (36.7%)	19 (63.3%)		
6-10	24 (60.0%)	16 (40.0%)		
11-15	23 (23.1%)	22 (21.9%)		
16-20	44 (52.4%)	40 (47.6%)		

*¹ SCHEW- Senior Community Health Extension Worker

*² JCHEW- Junior Community Health Extension Worker

*³ CHO- Community Health Officer

* include Traditional Birth Attendants, Voluntary Health workers, Health Information Officer

Effect of socio demographic variables on knowledge of Zn+Lo-ORS

The result in table 6 shows that respondents aged <25 years were less likely to be knowledgeable of Zn+Lo-ORS than those aged >35 years (OR= 0.63;

Midwives were more likely to be knowledgeable of Zn+Lo-ORS compared to others (OR= 10.20; 95% CI= 1.75-59.36). Respondents with 11-15 years of working experience were more likely to be

knowledgeable of Zn+Lo-ORS compared to those with 16-20 years of experience (OR= 1.65; 95% CI= 0.46-5.84).

the risk factors and prevention is treatment with oral rehydrated therapy, zinc, and continued feeding including breastfeeding (2,15,22,26-28). UNICEF

Table 6: Effect of socio-demographic variables on knowledge of Zinc+Lo-ORS

Background characteristics	Knowledge of Zn+Lo-ORS	
	Odds ratio	95.0% CI
<i>Age</i>		
<25	0.63	0.16-2.51
25-35	1.13	0.46-2.74
>35 (Ref)		
<i>Gender</i>		
Male	0.75	0.15-3.73
Female (Ref)		
<i>Cadre</i>		
Health assistance/Auxiliary Nurse	1.15	0.25-5.35
SCHEW* ¹	1.19	0.29-4.87
JCHEW* ²	2.19	0.41-11.66
Nurse	3.48	0.42-28.78
Midwife	10.20	1.75-59.36
CHO* ³	5.73	1.21-27.13
Others* (Ref)		
<i>Years of practice</i>		
1-5	1.65	0.46-5.84
6-10	1.70	0.64-4.52
11-15	2.48	0.97-6.36
16-20 (Ref)		

*¹ SCHEW- Senior Community Health Extension Worker

*² JCHEW- Junior Community Health Extension Worker

*³ CHO- Community Health Officer

* include Traditional Birth Attendants, Voluntary Health workers, Health Information Officer

Effect of socio demographic variables on knowledge of prescription of Zn+Lo-ORS

Respondents age <25 years were less likely to correctly prescribe Zn+Lo-ORS than those aged >35 (OR= 0.81; 95% CI= 0.21-3.06). Also, male respondents were less likely to prescribe Zn+Lo-ORS than female respondents (OR= 0.73; 95% CI= 0.16-3.24). Midwives were more likely to prescribe Zn+Lo-ORS compared to others (OR= 22.14; 95% CI= 2.35-208.15). Participants with 6-10 years of experience were less likely to prescribe Zn+Lo-ORS compared to those with 16-20 years of experience (OR= 1.95; 95% CI= 0.78-4.84). This is shown in table 7.

Discussion

Diarrhoea continues to be the main cause of childhood morbidity and mortality in developing countries including Nigeria. One of the key interventions to mitigate the burden of childhood diarrhoea besides

and WHO recommend Lo-ORS+Zinc for all children who have diarrhoea, and this proposal is being effectively promoted in Nigeria.

In the present study, the knowledge about Lo-ORS+Zinc was a little above average and higher than findings reported in some previous work in Cross River State [20] and Jigawa State [21] of Nigeria but similar to a study conducted in Benin-City, Nigeria [16]. The difference observed between studies could probably be due to the intensity of training programs on diarrhoea management, the nature of the health facilities, location, and tools for data collection; this indicates that the of Zn+Lo-ORS for under-five children is sub-optimal and there is a need for consistent intervention.

Good knowledge about Lo-ORS+Zinc amongst the health workers increased as age increased but these were not statistically significant. The majority of the participants that were above 35 years had appropriate knowledge about Zn+Lo-ORS

Table 7: Effect of socio demographic variables on knowledge of prescription of Zn+Lo-ORS

Background characteristics	Knowledge of prescription of Zn+Lo-ORS	
	Odds ratio	95.0% CI
Age		
<25	0.81	0.21-3.06
25-35	0.85	0.37-1.94
>35 (Ref)		
Gender		
Male	0.73	0.16-3.24
Female (Ref)		
Cadre		
Health assistance/Auxiliary Nurse	4.42	0.46-41.88
SCHEW* ¹	6.92	0.79-60.25
JCHEW* ²	4.92	0.49-49.27
Nurse	12.86	1.03-159.84
Midwife	22.14	2.35-208.15
CHO* ³	13.14	1.46-117.80
Others (Ref)		
Years of practice		
1-5	0.77	0.23-0.60
6-10	1.95	0.78-4.84
11-15	1.26	0.55-2.86
16-20 (Ref)		

*¹ SCHEW- Senior Community Health Extension Worker

*²JCHEW- Junior Community Health Extension Worker

*³CHO- Community Health Officer

*include Traditional Birth Attendants, Voluntary Health workers, Health Information Officer

given to children with diarrhoea episodes compared to other age groups. Assuming that older age corresponds with longer years in the practice of a job, this finding could be due to the exposure to knowledge of diarrhoea management and experience acquired over time. Although not statistically significant, correct prescription of Zn+Lo-ORS increased among the respondents as years of practice increased. However, this result shows that correct prescription for under-five children with diarrhoea is a major issue in our community and necessitates major intervention such as training. Within the cadre of PHCWs, the knowledge of zinc and Lo-ORS was more among nurses, community health officers, and midwives because a high proportion of them had good knowledge. This suggests that cadre positively influences good knowledge.

Exclusive breastfeeding (EBF) is an essential component of UNICEF's GOBI-FFF program of four relatively simple and inexpensive approaches that empower stakeholders and parents to save millions

of dying children from diarrhoea [15,28]. EBF cannot be left out when it comes to diarrhoea management in under-five children. In this study, 61.3% of primary healthcare workers indicated that it is appropriate to exclusively breastfeed a child with ORS in addition to breast milk. This implied that respondents were knowledgeable of the importance of EBF of breast-milk which is very nutritious and very hygienic, and can ensure that children have some degree of immunity from common infections during the first six months of life.

The level of knowledge of prescription for the treatment of diarrhoea disease for under-fives by PHCWs, when compared to the current World Health Organization (WHO) treatment guidelines, showed that only 68% of the primary health care workers had prescription knowledge of Lo-ORS with oral zinc for children under-five. Community health officers, nurses, midwives, and senior community health extension workers had better age-appropriate knowledge of prescription of Lo-ORS with oral zinc

for children under-five (that is, 10mg per day of oral zinc for a child less than 6 months old for 10 days, 20mg per day of oral zinc for a child more than 6 months old for 10 days, 50-100ml of Lo-ORS for a child less than 2 years and 100-200ml of Lo-ORS for a child more than 2 years after each loose stool) [18].

The overall knowledge of prescription of Lo-ORS in this study is low compared to the findings in Uganda [29] and India [30] and may be because in those studies, the assessment of prescription was based on ORS prescription and it was not well specified if it was Lo-ORS. In the present study, the overall prescription of oral zinc was high among the PHCWs which was similar to that reported in the Indian study whilst Zinc was not prescribed at all in the Ugandan study [29,30]. The lower level of knowledge of prescription of Lo-ORS in the treatment of childhood diarrhoea observed in our study may indicate a suboptimal knowledge of the current WHO diarrhoea treatment guidelines among the PHCWs. The translation of knowledge into clinical practice is another factor that may have contributed to the poor utilisation of this life-saving intervention. Strategies on behavioural change communication will enable promotion of utilisation of evidence-based health interventions.

Few PHCWs' knowledge of prescription of zinc in addition to the Lo-ORS (i.e. Zn+Lo-ORS), is in line with the WHO/UNICEF guideline for the management of childhood diarrhoea. This is contrary to the findings in the Benin Republic where the majority of healthcare workers prescribed an antibiotic in adjunct to zinc [12]. One plausible reason for this could be a difference in policy and programmes on the treatment and management of diarrhoea in children amongst African countries.

The PHCWs with longer years of working experience were more likely to be more knowledgeable and to prescribe Zn+Lo-ORS than others. This finding differs from those obtained in studies carried out in southern and north-western states of Nigeria, and Benin Republic [16,18,20–22]. This could be due to difference in characteristics of the study population, aims and objectives, and as well as study area of the studies.

Amongst the various cadres of PHCWs, midwives were more likely to be more knowledgeable and to prescribe Zn+Lo-ORS compared to other cadres of PHCWs. Perhaps there are aspects of the current midwifery training, pre and post qualification, that serve as a

motivation for acquiring more knowledge that will impact child health beyond the new born period.

Conclusion/Recommendation

Overall, it was found in this study that primary healthcare workers' level of knowledge and knowledge of prescription of zinc and Lo-ORS for childhood diarrhoea was suboptimal. The primary healthcare workers' cadre was observed to contribute significantly to the knowledge of prescription of Zn+Lo-ORS among other factors. Respondents with longer years of working experience were more likely to have the correct knowledge of prescription of Zn+Lo-ORS. We suggest that massive campaigns in promoting the use of Zinc+Lo-ORS in the clinical management of diarrhoea for under-five children should be embarked upon. Primary healthcare workers should be engaged in periodic training on the current management of diarrhoea.

Limitation

This study being a cross-sectional study, a causal relationship between specific variables and the use of zinc supplementation cannot be inferred. It is also possible that some answers or responses might have been affected by recall bias. An attempt was made to minimise the by providing few options with appropriate and inappropriate responses for the questions. This study also did not include the general medical practitioners in the PHCs.

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