ORIGINAL RESEARCH

Exploration of Barriers to the Recommendation of Oral Rehydration Salts and Zinc Tablets for Acute Diarrhoea by Patent and Proprietary Medicine Vendors in Lagos State, Nigeria

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ABSTRACT

Background: Diarrhoea has remained a global burden and leading cause of morbidity and mortality among under-five children especially in low and middle-income countries in spite of availability of oral rehydration salts and zinc tablets (ORS/Zn,), which are the proven and recommended treatments. This persistent global burden indicates possible barriers in the prescription, recommendation or use of ORS/Zn among stakeholders.
Objective: This study explored the factors that act as barriers to the recommendation of ORS/Zn in the management of childhood acute watery diarrhoea (AWD) by Patent and Proprietary Medicine Vendors (PPMVs) License holders in Lagos State.
Methods: A qualitative study carried out through interviews of PPMVs. A purposive recruitment of 24 PPMVs was done with 18 of them finally participating in the study. Thematic analysis through peer coding was employed to extract the findings of the study presented in themes and subthemes.
Results: Three themes associated with barriers to recommending ORS/Zn emerged: rejection of ORS/Zn by parents of children with AWD, misconception about ORS/Zn and difficulties with ORS/Zn preparation. The enhancement of the taste of ORS was the major theme associated with factors that could facilitate recommendation of ORS/Zn.
Conclusion: This study revealed that PPMVs knew that they should recommend ORS/Zn for AWD but encountered barriers such as rejection of ORS/Zn by parents, misconception of ORS/Zn and difficulties in the preparation of ORS. They opined that enhancement of the taste of ORS may facilitate acceptance by parents.

Keywords: Acute Watery Diarrhoea, AWD, ORS/Zn, Patent and Proprietary Medicine Vendors, PPMVs, Barriers

INTRODUCTION

Diarrhoea remains a leading cause of morbidity and mortality among children under the age of five years in low and middle-income countries[1]. According to World Health Organization (WHO), diarrhoea is responsible for the death of about 525,000 children under the age of five years annually[2]. This global burden of diarrhoea is still a problem that needs urgent intervention. This is particularly true due to

the fact that frequent diarrhoeal episodes in children leads to malnutrition and stunting which can lead to cognitive delay[3,4]. Most of the deaths associated with diarrhoea are as a result of dehydration[2]. Therefore, it is paramount that the lost fluid and electrolytes be replaced promptly.

Rational use of medicine in the management of acute watery diarrhoea (AWD) requires the use of oral rehydration salts (ORS) to reverse dehydration and supplementation with zinc tablets for 10–14 days[5]. Oral rehydration salt (ORS) and zinc supplementation have been shown by several studies to reduce the morbidity and mortality associated with AWD especially in children, reduce the frequency of stooling, and also reduce the severity[2]. However, benefits of this therapy are only gained if treatment is initiated promptly, intake of fluids is increased and feeding of child is continued.

A Patent and Proprietary Medicine Vendors (PPMV) License holder is a person who has undergone apprenticeship under the supervision of a senior colleague and is licensed to sell Over The Counter (OTC) drugs and provide First Aid but does not have a formal training in a Faculty of Pharmacy[6,7]. PPMVs and Community Pharmacists are considered as readily available and accessible sources of supply of drugs. Therefore, they are usually the first port of call in common diseases such as diarrhoea[8]. Being a common first port of call, it is of utmost importance that they are equipped with the right knowledge essential in improving outcomes and reducing complications during diarrhoea. The practices of PPMVs are regulated and supervised by Pharmacists Council of Nigeria that categorized them in three tiers[9]. The National formulary and Essential medicines list have an approved patent medicine list for their practices. Oral rehydration salts and zinc (ORS/Zn) are among the medicines on the list and they are expected to have adequate knowledge of the medicines on the list.

Services of PPMVs were approved by the Federal Ministry of Health as necessary to ensure universal access to essential medicines at grass root level[6]. To improve knowledge of ORS/Zn in the management of acute watery diarrhoea among PPMVs in Lagos, Clinton Health Access Initiatives (CHAI) provided trainings for them in partnership with Federal and Lagos State Ministries of Health between 2013 and 2016[10]. They are expected to recommend ORS/Zn for acute watery diarrhoea based on the national treatment guideline.

Despite the benefits of ORS/Zn therapy and the training received, its usage by Patent and Proprietary Medicine Vendors (PPMVs) is still suboptimal[6]. Several studies have shown that irrational use of medicines is prevalent among different cadre of health workers in Nigeria including PPMVs[11-14]. Some other studies confirmed that this population of health providers stock ORS/Zn tablet and have good knowledge of its benefits but do not use it correctly[6]. Only few of these studies have been able to explain why they do not use it correctly and the factors that act as barriers to recommending it[15-17]. This shows there is a gap between the PPMVs' practices and their knowledge of the current treatment guideline in the management of AWD resulting in irrational use of medicines[17]. This study therefore was aimed at investigating the reasons for the knowledge and practice gap demonstrated by PPMVs by exploring the factors that act as barriers to their recommendation of ORS/Zn in the management of AWD. Adequate knowledge of barriers to the use of ORS/Zn from the perspective of PPMVs would yield definitive information necessary for appropriate interventions.

METHODS

Study design

In order to obtain rich information about the various factors that act as barriers to recommending ORS/Zn by PPMVs and to explore their views about the management

of AWD, a qualitative, phenomenological research method was employed. Phenomenological research is a qualitative research approach which focuses on detailed examination of lived experience among a group of people or study population. The fundamental goal of the approach is to arrive at a description of the nature of the particular phenomenon[18]. This study explored the lived experiences of PPMVs with the goal of describing the barriers and challenges to the use of ORS/Zn in their practice.

Study population

The study population consisted of medicine vendors who worked in patent medicine shops duly registered by the Pharmacists Council of Nigeria (PCN). PCN maintains a register of PPMVs as prescribed by the Nigerian law.

Recruitment and sampling

Phenomenological studies require between 5 and 25 interviews[18,19]. Recruitment into the study was challenging because participants feared regulatory sanctions despite provision of information that the study was for research purpose only. Convenience sampling was therefore employed for this study. To overcome the difficulty of recruiting participants into the study a medicine distributor from whom PPMVs source their supplies and seemed to trust was recruited as a research gatekeeper to gain access to study participants. This gatekeeper introduced the study to potential participants assuring them that the study will have no repercussion to them or their practices.

Recruitment, interviews and coding were done concurrently to ensure adequacy of data collection. The first 3 interviews yielded diverse information, which led to recruitment of the next 5 participants. The information began to converge with this addition and 10 more participants were recruited to ascertain the saturation of information. In total, 24 PPMVs were actually recruited with only 18 participating in the study. The other 6 withdrew from participation because they were not convinced there would be no regulatory sanctions after being briefed about the study.

Data collection tool

The data collection tool used for this study was a semi-structured interview guide. The guide was developed based on the objective of the study and literature reviews. The guide covered three domains: experiences in the management of diarrhoea, barriers to recommending ORS/Zn and general thoughts on how to improve recommendation of ORS/Zn by PPMVs.

Interview guide

- Describe your experiences as a patent and proprietary medicine vendor
- Describe your experiences in the management of AWD in patent medicine stores
- Explain what guides your management and selection of medicine for AWD
- Do you manage diarrhoea in children with same approach?
- What is the place of zinc tablet in the management of AWD?
- What are the barriers for not recommending ORS/Zn?
- What are your thoughts about ORS and Zinc in the management of AWD in patent medicine stores in Lagos?

Follow-up questions

- What are the signs that depict weakness in children and adults?
- How do you reconstitute the ORS?
- What do you do if a patient is weak?

The follow-up questions were included after the analysis of the first few interviews. As the data unfolded, it appeared necessary to explore the views of the participants on the follow-up questions. The follow-up interviews were done through phone calls.

Data collection procedure

The interviews were conducted in the various offices of the PPMVs. There was a brief overview of the study to ensure voluntary participation and that PPMVs

understood the purpose of the study. The participants signed informed consent forms after agreeing to the interview. The interview lasted between 20 and 60 minutes. Handwritten notes were taken as many participants declined audiotaping. In order to clarify uncertainties, participants were requested to recap their responses. Responses were thereafter read aloud to participants to ascertain correctness. The study was done between April 2018 and January 2019.

Data analysis

The inductive approach was adopted for the purpose of this work and the data analyzed as they unfolded. The research objectives were used as a guide for the grouping of data. During the data collection process, a coding framework was developed from the transcribed data and the analysis started from the first interview and continued throughout the process.

Data analysis proceeded in three phases: Transcription of data during which data collected during interviews were organized into texts; coding and precoding, where the data were further compressed into codes through a peer coding process to create easily understandable concepts and patterns as well as remove the bias of single coding; and extraction of codes from the collected data after which they were merged into themes and sub-themes to answer the research objectives[20]. Only two of the interviews were audiotaped as the other participants objected to audiotaping.

Ethical considerations

Ethical approval was obtained from the Lagos University Teaching Hospital (LUTH) Health Research and Ethics Committee (HREC), with Health Research Committee assigned number: ADM/DCST/HREC/APP/2311.

RESULTS

The aim of this study was to explore the barriers to recommending ORS/Zn in the management of AWD by PPMVs. In the course of exploring the barriers, various factors that might facilitate the recommendation were also explored. The result of this qualitative study is reported in three parts based on the data obtained and analysed from the interviews.

1) Demographic characteristics of study participants
2) Barriers to recommending ORS/Zn by PPMVs in AWD.
3) Facilitators for ORS/Zn recommendation by PPMVs in AWD

Social demographic characteristics of participants

Of the 18 participants, 5 were female and 13, male. Their educational qualification ranged from primary to tertiary; and all but one participant has been practising for more than 10 years (Table 1).

Table 1: Social-demographic characteristics of participants

Variable	Characteristics	Frequency (n=18)
Gender	Male	13
	Female	5
Age range (years)	<20	1
	21-30	1
	31-40	4
	41-50	10
	>50	2
Academic qualification	Primary	2
	Secondary	11
	Tertiary	5
Number of years in practice	5-10	1
	11-20	8
	21- 30	6
	> 30	3

Barriers to recommending ORS/Zn by PPMVs in AWD

Three themes emerged clearly from the data collected for this study as barriers to use of ORS/Zn in practice. The themes for the barriers were: rejection of ORS/Zn by parents, misconceptions about ORS/Zn among PPMVs and difficulties with preparation of ORS/Zn by clients.

Theme 1: Rejection of ORS/Zn by parents of young children with AWD

Almost all the respondents pointed out rejection of ORS/Zn by parents and even adult patients as a major drawback to recommending it. Some of the PPMVs knew that ORS is beneficial and recommend it for AWD but were constrained by rejection of ORS by caregivers and adult patients. The PPMVs would rather offer something that is acceptable to their customers than forfeit them to another vendor. One respondent said:

> *"Before you even offer ORS/Zn, the mothers especially, will remind you that they do not want it"* [Female PPMV 9, 12 years in practice].

Another respondent said:

> *"The parents will even tell you that their children will not take it because of the taste. So, it is better you give them what they will use"* [Female PPMV 3, 9 years in practice].

Two possible explanatory sub themes for ORS/Zn rejection were identified; taste of ORS and request for metronidazole. The participants had the following to say about the taste of ORS.

> *"It even worsens the condition as the child throws up in an attempt to force it on them"* [Female PPMV 3, 9 years in practice].
>
> *"Children do not like the taste"* [Male PPMV 2, 10 years in practice].

Despite the fact that respondents showed high level of awareness on the benefits of ORS/Zn in the management of AWD, the irrational use of metronidazole was still very high. According to the participants, the patients had already decided to buy metronidazole before they came to them.

> *"No matter what you say, they request to buy Flagyl®"* [Male PPMV 16, 8 years in practice].

Not yielding to their request would result to loss of sales and possibly clients.

> *"If you refuse to sell Flagyl® and other anti-diarrhoeals to them, they will get it elsewhere"* [Female PPMV 9, 12 years in practice].

The majority of participants acknowledged that they would forfeit the customers to others who were willing to dispense other medications aside ORS/Zn.

Theme 2: Misconceptions about ORS/Zn.

Some study participants believed ORS is not a drug and as such offer other medicines either alone or together with ORS/Zn as an adjunct therapy.

> *"In managing diarrhoea, your priority should be to stop the diarrhoea first, therefore, you give anti-diarrhoeals like Diastop and if the child is weak, you add ORS/Zn"* [Male PPMV 7, 25 years in practice].
>
> *"ORS is used in diarrhoea to restore strength but Flagyl® and Lomotil or Diastop will help stop the stooling"* [Female PPMV 3, 9 years in practice].
>
> *"Flagyl® works faster. ORS takes time"* [Male PPMV 15, 18 years in practice].

This theme of misconception showed that the participants seemed to believe ORS is for children and used only when there are signs and symptoms of weakness. Signs of weakness as identified by the participants are rapid breathing, sunken eyes, fainting, and inability to walk. This belief makes the patient prone to complications of dehydration, which could have been prevented by the use of oral rehydration solution.

Although participants acknowledged that ORS restores strength in AWD, they did not know the exact mechanism of action. They perceived ORS as one of the options that can be used to restore strength.

> *"If the patient is not weak, there is no point giving ORS since it is just for strength. Rather, I advise them to buy Sprite and add Salt to it"* [Male PPMV 10, 13 years in practice]. (Sprite is a colourless, lime and lemon flavoured soft drink popular in Nigeria).

An explanatory subtheme for the misconception about ORS is inadequate or incorrect knowledge about the use of ORS to prevent dehydration, an important goal in the management of AWD. In addition, their

knowledge of the role of zinc in the management of AWD appeared very poor. In response to questions about the role of zinc tablets, one participant said:

"Zinc tablet serves as an antibiotic used when the stooling is caused by germs" [Male PPMV 1, 8 years in practice].

Another participant said:

"The child just finished taking antibiotic, why do you still give him antibiotic?" [Male PPMV 5, 5 years in practice].

Yet other participants responded as follow:

"It is for adults but you can give it to children as well, it is just like a drug used to stop diarrhoea fast" [Male PPMV 10, 13 years in practice].

"Zinc is for adult but can be given to children if the diarrhoea is caused by germs" [Male PPMV 10, 13 years in practice].

"Zinc is the same with ORS, it stops the stooling fast and prevents weakness." [Male PPMV 11, 13 years in practice].

The use of carbonated drinks and concentrated glucose solution was also identified as a barrier to recommending ORS/Zn in AWD. Participants reported the use of carbonated drinks for AWD as normal practice based on the premise that these drinks restore strength. Although some recommended the addition of salt in order to mimic a salt-sugar solution, the osmolarity remains questionable.

"If the child is weak, I tell the mother to buy Sprite or 7up and add salt to it. This also gives strength" [Female PPMV 6, 12 years in practice].

Misconceptions about the role of ORS is a strong barrier to the use of ORS among PPMVs and these barriers might promote complications in the management of AWD.

Theme 3: Difficulties with ORS/Zn preparation among clients

Participants identified the reconstitution process and the bulkiness of the reconstituted product as a barrier to recommending ORS to adult patients who are at work. They claim that finding a one-litre container is not so easy and if they eventually find one, it is too bulky to carry around.

"They find it difficult to mix and carry around i.e. the adults" [Male PPMV 16, 16 years in practice].

Participants identified improper usage by mothers as another factor that discouraged use of ORS.

"Even after illustration, they end up not using it properly" [Male PPMV 15, 18 years in practice].

Participants believed that for such caregivers, recommending ORS will amount to improper usage and as such, other medications become appropriate.

Factors that can facilitate recommendation of ORS/Zn

One major theme emerged with respect to facilitation of recommendation of ORS/Zn: enhancement of the taste of ORS.

- **Enhancement of taste**

  Some of the responses obtained showed that if there were an enhancement in taste, it would facilitate the use of ORS since one of the major reasons for rejecting it is due to the unpleasant taste. More than 90% of the participants identified taste as one of the barriers to recommending ORS/Zinc.

  "If the taste is pleasant, I believe mothers will not reject it when given" [Male PPMV 15, 18 years in practice].

  "If they produce it to have a pleasant taste, a lot of us will have no problem recommending it because it is even cheap and affordable" [Female PPMV 11, 18 years in practice].

  Findings from this study suggest that the level of awareness of ORS among participants and their clients is relatively adequate, and acceptance level might increase with enhanced taste of ORS. Therefore, if the barrier of taste were addressed, it would become easier for PPMVs to recommend ORS/Zn when the need arises.

DISCUSSION

The information obtained from this study show that PPMVs have an appreciable knowledge of ORS use in the management of acute watery diarrhoea (AWD) but do not always recommend it; and this indicates dissonance between their espoused theory and their theory-in-use. The implication of low recommendation is slow progress in awareness and utilization of ORS among patrons of PPMVs. This finding is in agreement with that observed in Enugu state by Aguwa and colleagues where majority of PPMVs knew that ORS should be use in AWD cases[17]. Our study shows that PPMVs in Lagos State are limited by barriers such as rejection of ORS by parents of children who have AWD and adult patients as well due to the unpleasant taste of ORS; and the high rate at which patients request for antibiotics (Flagyl®) amongst other barriers. Although some of the participants answered correctly to the use of ORS for AWD, they preferred to dispense antibiotics and antidiarrhoeals due to the barriers encountered. This suggests that if the reasons for rejecting ORS by caregivers and the patients are eliminated, ORS use in AWD will increase in the absence of other barriers.

The participants had varying degrees of misconceptions about ORS use in AWD. Majority of PPMVs believed ORS is an adjunct therapy in diarrhoea, used symptomatically when there are signs of weakness. The consequences of this is that the patient would have suffered some degree of dehydration and its complications before rehydration is initiated. This further points to the fact that they do not have adequate knowledge about complications of diarrhoea. Since prevention of dehydration is the goal of therapy with ORS in AWD, it is important that health providers are well equipped with the right knowledge and approach in preventing dehydration using ORS/Zn[21].

Findings from this study also show that rejection of ORS by parents of children who have AWD and adult patients appears to be the most encountered barrier to recommending ORS. Many of the participants who encountered this barrier were willing to dispense ORS in accordance with the current treatment guideline but were limited by clients' rejection. They therefore resorted to other practices in order not to forfeit their customers. Reasons for rejection such as taste, are product-related factors which can only be improved on by the manufacturers. Other reasons for rejection related to either the PPMVs lack of knowledge and caregivers' misconceptions of ORS would require proper and continuous orientation of both stakeholders to improve acceptance.

Metronidazole, popularly known with the brand name Flagyl®, a Prescription Only Medicine not recommended for diarrhoea was discovered to be wrongly used by almost all the participants as the drug of choice in AWD. The clinical implications of this include risk of developing antimicrobial resistance and unnecessary exposure of the child to drug therapy problems such as exposure to unnecessary drugs and adverse drug reactions. This finding is in line with several other studies, thereby reflecting weak regulatory actions and lack of reinforcement amongst this group of health providers[11,17,22]. Necessary steps should be taken to ensure that PPMVs do not go beyond their scope in the use of certain drugs, and good referral practices should be reinforced. Information obtained also show that the drug metronidazole is being regarded as the norm in the treatment of AWD. This is a reflection of earlier findings from Clinton Health Access Initiative (CHAI), which showed that the request to buy Flagyl® and antidiarrhoeal agents by patients who have AWD in Nigeria is high despite the level of awareness on the dangers of self medication[23]. Grassroot sensitization at the community level and mass media can help to halt the already escalating trend in the irrational use of metronidazole in AWD.

Very few participants pointed out inconvenience of reconstitution and bulkiness as barriers to recommending ORS.

However, considering the production of smaller packages may help reduce the excuse of bulkiness thereby improving recommendation and acceptance level. The reconstitution of ORS was also identified to be a limiting factor as some of the participants stated that they were constrained by the fact that the patient may not get the reconstitution right. In view of the participants' suggestion and opinion, having an already reconstituted ORS will improve usage of ORS.

Zinc supplementation on the other hand has not gained awareness like ORS as most of the participants did not know the function of zinc nor its pharmacological use. In contrast to the findings of CHAI, most of the participants seemed not to understand the place of zinc in AWD treatmemt[23]. This is an indication that the dissemination of information about zinc and its uses is yet to be established among PPMVs.

A very grave misconception about the use of ORS only when the patient is weak calls for reorientation of PPMVs, and more public health campaigns on the benefits of ORS. Weakness indicates that the patient is already prone to complications of dehydration which could be fatal. Substitution with different carbonated flavoured drinks with or without the addition of salt is also of great concern because the sugar content of these drinks is already very high and might increase diarrhoea.

The barriers raised from the analysis of this research are mainly related to acceptability of ORS/Zn by both PPMVs and patients than lack of knowledge about its use. Also, the issue of antidiarrhoeals and antibiotics being more effective and faster in action than ORS/Zn as claimed by some of the respondents is very worrisome since these classes of medicines have no benefit in rehydration which is the goal of diarrhoeal therapy[5]. This study also identified regulatory lapses as a major barrier to recommending ORS/Zn by PPMVs. Although some of the respondents reported that they are willing to recommend ORS when the patients request for antidiarrhoeals and antibiotics, the fear of losing the customer to another vendor usually makes them dispense as requested. If there is reinforcement of standard treatment guideline in this sector, it will go a long way to improve rational dispensing.

The factors that could facilitate the recommendation of ORS in AWD as pointed out by some of the participants are worthy of note. Various strategies should be established to increase awareness and also reinforce rationale prescribing and dispensing. With reference to literature review and the findings from this study, more awareness needs to be created on the mechanism of action of ORS/Zn and the consequences of AWD as the study has revealed that most of the PPMVs are not well equipped with knowledge on the mechanism of action of ORS/Zn which led to irrational dispensing. The years of practice by PPMVs seemed not to have had any effect on the findings of this study. This shows the need for PPMVs to be properly trained in the service which they are purportedly providing.

CONCLUSION

This study has shown that PPMVs in Lagos State have an appreciable awareness about the use and benefits of ORS/Zn for AWD, but are hindered by client factors such as rejection of ORS/Zn by parents, misconception of ORS/Zn and difficulties in preparation of ORS. They suggested that enhancement of the taste of ORS may facilitate acceptance by parents of young children.

REFERENCES

1. Walker CLF, Rudan I, Liu L, Nair H, Theodoratou E, Bhutta ZA, *et al*. Global Burden of Childhood Pnemonia and Diarrhoea. Lancet, 2013; 381(9875): 1405-1416.doi:10. 1016/S0140-6736(13)60222-6.
2. World Health Organization. Diarrhoeal disease. [Online]

https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease [Accessed: 3 January 2019].
3. Checkly W, Buckley G, Gilman RH, Assis AM, Guerrant RL, Morris SS, *et al*. Multi-Country Analysis of the Effects of Diarrhoea on Childhood Stunting. International Journal of Epidemiology, 2008;37:816-830.
4. Walson JL and Berkley JA. The impact of malnutrition on childhood infections. Current Opinion in Infectious Diseases, 2018; 31(3):231-236. doi:10.1097/QCO000000000000448
5. World Health Organization/United Nations Children's Fund. WHO / UNICEF Joint Statement Clinical Management of Acute Diarrhoea. [Online] www.unicef.org/publication/files/ENAcute_Diarrhoea_reprint.pdf [Accessed: 2 July 2017]
6. Bayeler N, Liu J and Sieverding MA. Systematic Review of the Role of Proprietary and Patent Medicine Vendors in Healthcare Provision in Nigeria. PLOS One, 2015;10(1): e0117165Doi: 10.1371/journal.pone.0117165.
7. Durowade KA, Bolarinwa OA, Fenenga CJ and Akande TM. Operations and roles of patent and proprietary medicine vendors in selected rural communities in Edu Local Government Area, Kwara State, north-central Nigeria. Journal of Community Medicine and Primary Health Care, 2018;30(2),75-89.
8. Treleaven E, Liu J, Prach LM and Isiguzo C. Management of Paediatric Illnesses by Patent and Proprietary Medicine Vendors in Nigeria. Malaria Journal, 2015;14(232).doi: 10.1186/s12936-015-0747-7.
9. Punch Newspapers. FG Classifies Patent Medicine Vendors into Three Tiers [Online] https://punchng.com/fg-classifies-patent-medicine-vendors-into-three-tiers/ [Accessed 9 May 2020]
10. Clinton Health Access Initiative. Shaping Local Markets to Scale Up Zinc and ORS in Nigeria. [Online] http://clintonhealthaccess.org [Accessed 7 May, 2020].
11. Uzochukwu BSC, Onwujekwe OE, Okwuosa C and Ibe OP. Patent Medicine Dealers and Irrational Use of Medicines in Children: The Economic Cost and Implications for Reducing Childhood Mortality in Southeast Nigeria. PLOS One, 2014;9(3):e91667. doi:10.1371/journal.pone.0091667.
12. Olusegun A and Adeniyi A. Irrational Use and Non-prescription Sale of Antibiotics in Nigeria: A Need for Change. Journal of scientific and innovative Research, 2014;3(2):251-257.
13. Ogbo PU, Aina BA and Aderemi-Williams RI. Management of acute diarrhoea in children by community pharmacists in Lagos, Nigeria. Pharmacy Practice, 2014; 12(1), 1–6. doi.org/http://dx.doi.org/10.4321/s1886-36552014000100002.
14. Ogbo PU, Soremekun RO, Oyetunde OO and Aina BA. Prescribing Practices in the Management of Childhood Diarrhoea in Primary Health Care Centres in a Sub-urban Community in Nigeria. Journal of Community Medicine and Primary Health Care, 2019;31(1):32-39.
15. Oyetunde O and Williams V. Community pharmacists' views of the use of oral rehydration salt in Nigeria. International Journal of Clinical Pharmacy, 2018;40:659-67.
16. Ekanem EE, Akinwumi F, Umejiego CN, Ikeagwu, GO and Anidima T. Risk Factors, Pre-presentation Management and Clinical State of Children with Diarrhoea Presenting in a Community Cottage Hospital. Nigeria Journal of Paediatrics, 2017; 444.163. 10.4314/njp.v44i3.7.
17. Aguwa EN, Aniebue PN and Obi IE. Management of Childhood Diarrhoea by Patent Medicine Vendors in Enugu North Local Government Area, South-East Nigeria. International Journal of

Medicine and Medical Sciences, 2010;2(3):88-93.
18. Creswell JW. Research Design. (J. W. Creswell, Ed.), *SAGE* (4th ed., Vol. 91). Thousand Oaks, Carlifornia; 2014
19. Morse JM. Determining Sample Size. Qualitative Health Research, 2000;10(1),3-5.
20. Wester F and Peters V. Qualitative Analysis: Phases, Techniques and Computer use. Studies in Qualitative Methodology, 2001; 6. 139-164. 10.1016/S1042-3192(00)80026-9.
21. United Nations Children's Fund/World Health Organization. Diarrhoea: Why Children are Still Dying and What can Be Done. (L. Jensen, Ed.). New York; 2009.
22. Nkeokelonye A. Formative Research on Pediatric Diarhhoea Management Report in Abia, Benue and Nassarawa states, Nigeria. Abt Associates Inc. – SHOPS/USAID; 2013
23. Clinton Health Access Initiative. Report of the WHO Expert Committee, 2015 (Including the 19th WHO Model List of Essential Medicines and the 5th WHO Model List of Essential Medicines for Children).