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Knowledge and Use of Oral Rehydration Solution in the Management of Childhood Diarrhoea among Mothers in a Tertiary Health Facility in Port-Harcourt, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Oral rehydration solution (ORS) has been a life-saving remedy in the home and hospital management of dehydration, particularly in infants and children under the age of five. The improper use has however resulted in morbidity and mortality in children. The purpose of this study is to assess proper use of ORS by mothers in the management of diarrhoea in under-five children.
Methods: A cross-sectional study was conducted over 3 months. Mothers of children under five years of age presenting with diarrhoea at the Diarrhoea Training Unit of a tertiary hospital were interviewed using a pretested structured interviewer-administered questionnaires. Data was analysed using SPSS version 20.0.
Results: A total of 90 mothers were interviewed. 86.7% of respondents were of a high socioeconomic class. 51.1% of children with diarrhoea were between 6-15months of age. (Mean age of 17 $\pm$ 12.3 months). Although 93.3% of mothers were aware of ORS, 64.4% reported using it to treat their children. Only 40 (44.4%) respondents constituted ORS appropriately and discarded unused portions at 24 hours.

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Conclusion: Although mothers of under-five children are aware of the efficacy of ORS in the management of diarrhoea, their knowledge of its proper use is limited. Increased awareness among mothers of under-five children about the proper use of ORS is necessary to avoid debilitating complications such as dehydration, electrolyte imbalance, etc.

Keywords: Oral rehydration solution; diarrhea; under-five; mothers; proper use.

1. INTRODUCTION

Diarrhoea is defined by the World Health Organization (WHO) as the passage of three or more loose stools per day or the passage of stools more frequently than is normal for the individual [1]. Under-five children constitute 63% of the global burden of diarrhoea, accounting for over 500,000 deaths each year [2,3]. Diarrhoea is a leading cause of death among under-five children in Sub-Saharan Africa, and the majority of diarrhoeal deaths are due to dehydration [4]. It has been demonstrated that timely use of oral rehydration therapy (ORT) significantly reduces the mortality associated with diarrheal illnesses [5,6]. The term, Oral rehydration therapy, refers to the administration of the standard WHO oral rehydration solution (ORS), recommended home fluids such as sugar-salt solution, or simply increased fluid intake during a diarrheal illness. The Integrated Management of Childhood Illnesses (IMCI) guidelines recommend the use of ORS, continued feeding and oral zinc for appropriate case management of diarrhoea [7].

Oral rehydration salt solution first came into use following its adoption and distribution by the WHO in 1975 [8]. Prior to that, researchers had identified the critical role of sodium and glucose co-transport in the small intestine, [9-11] paving way for the 1968 development of ORS at the International Centre for Diarrhoeal Diseases Research in Bangladesh [12]. Its use in developing countries was facilitated by WHO, in collaboration with the United Nations Children's Emergency Fund (UNICEF) and the World Bank to assist in addressing the alarming rates of under-five mortality, as a component of the child survival strategies [13].

The lack of awareness and acceptance of ORS has been a significant barrier to its use [14-16]. Oral rehydration solution is inexpensive and readily available in most patent medicine stores and pharmacy shops in Nigeria. The standard WHO ORS solution pack is diluted with one (1) litre of clean water and should be used within twenty-four (24) hours.

Several studies have demonstrated that despite the awareness of the efficacy of ORS, caregivers use it infrequently [4,17]. This gap between the knowledge and use of ORS may be due to a variety of factors, including caregiver ignorance and a desire for rapid resolution of symptoms, which is not always met with the use of ORS. Additionally, some caregivers find ORS difficult to administer because some children do not tolerate it well. Another possible explanation for this know-do gap is limited access to ORS, whereby even when a family agrees to use it, they are unable to obtain it. Mothers are widely recognised to be the primary caregivers for children under the age of five. In majority of cases, mothers are responsible for the overall management of their children's diseases; thus, their level of awareness and proper practise are critical to the successful use of ORS in the care of children with diarrhoea. Thus, the purpose of this study is to ascertain mothers' knowledge and practise regarding the use of ORS for children with diarrhoea.

2. METHODOLOGY

A cross-sectional study was conducted over 3 months (October to December, 2018) among mothers of under-five children with diarrhoea seen at the Diarrheal Training Unit (DTU) of the University of Port Harcourt Teaching Hospital (UPTH), Rivers State. Rivers State is situated in the South-South geopolitical zone of Nigeria. The University of Port Harcourt Teaching Hospital is Rivers State's premier tertiary health care and research facility. It serves as a referral centre for several primary health centres, private hospitals and state-owned general hospitals located throughout Rivers, Bayelsa, and other neighbouring states. It has a capacity of 790 beds and is organised into clinical departments such as Paediatrics, Internal Medicine, Mental health, Surgery, and Obstetrics/Gynaecology.

The Diarrhoea Training Unit has an average of 25 patients daily. The clinic is managed by three consultants, a senior registrar, a registrar and a house officer with the assistance of nurses. The patients are typically between the ages of 2 months and 5 years and are brought in by caregivers, most frequently the child's mother.

The clinic attends to children with acute diarrhoea lasting less than 14 days. It is open Monday through Friday from 8 am to 4 pm. Children brought in by individuals other than their mothers were excluded from the study, as were children who required immediate medical attention. Only mothers were interviewed.

The study participants were recruited using a convenient sampling technique. Each day, at the start of the clinic session, the researcher gave a brief description of the study's utility to all patients and their parents in the patient waiting area. They were permitted to ask questions, which were answered. After applying the selection criteria, informed consent was obtained from each respondent. To elicit information from mothers, a structured interviewer-administered questionnaire was used. The questionnaire was reviewed by the authors and face-validated by two experts in the field of community paediatrics. The following information was gathered: - sociodemographic characteristics of mother/child pair (age, sex, occupation, level of education), the duration of the diarrhoea and whether ORS was given. Diarrhoea was defined as passing three or more watery or loose stools in a 24-hour period [1]. Among those who administered ORS, specific questions were asked to ascertain how it was constituted. Mothers were required to specify the exact amount of water used to constitute ORS using standard household containers such as 1.5 Litres industrially purified bottled water, 35 Cl- Coca-Cola bottle and 50 cl sachet water. The WHO ORS sachet available in Nigeria is constituted with 1 litre of water, which can be obtained by filling water up to the 1st ring of a 1.5 L bottled water container, a little over three 35-CL Coca-Cola bottles, or two 50cl sachet water bags. Some measuring containers in the unit were also used to help mothers describe the quantity of water used. Additionally, they were asked how long they kept the ORS mixture after constitution. The unused constituted ORS mixture should be discarded after 24 hours.

Participation in the study was voluntary and no form of punitive measures were taken against mothers who declined. All mothers surveyed had children under the age of five who had an episode of diarrhoea occurring in the preceding two weeks. Respondents' information was kept confidential and participants' identity during data collation was completely anonymous. Data were analysed using SPSS version 20.0. Following data collection, all study participants and their children received appropriate clinic care.

3. RESULTS

A total of 90 mothers were interviewed, most of which (86.7%) were of high socioeconomic class. About a half (51.1%) of children with diarrhoea were between 6-15 months of age. There were fifty-two (57.8%) male children and thirty-eight female children (42.2%).

Although more than 90% of mothers were aware of ORS, barely two-thirds (64.4%) reported using it to treat their child's diarrhoea. A majority (84.3%) of respondents heard about ORS from health care workers/ health facilities. The prevalence of use of ORS was 64.4%. Only 40 (44.4%) respondents constituted ORS appropriately and discarded unused portions at 24 hours.

Table 1. Socio-demographic characteristics of the respondents

Variable	Frequency(n=90)	Percent
Age of child (months)		
2-5	8	8.9
6-15	46	51.1
16-25	24	26.7
26-35	4	4.4
36-45	4	4.4
46-55	2	2.2
56-65	2	2.2
Mean-17±12.3		
Sex of child		
Male	52	57.8
Female	38	42.2
Mother's occupation		
Teaching	12	13.3
Petty trading	4	4.4

Variable	Frequency(n=90)	Percent
Trading (shop owner)	18	20.0
Student	4	4.4
Civil servant	28	31.1
Housewife	12	13.3
Hairdresser	4	4.4
Professional	8	8.9
Mother's highest level of education		
Secondary	10	11.1
Tertiary	58	64.4
Post-graduate	22	24.4
Social class		
Upper	78	86.7
Middle	12	13.3
Lower	0	0.0

Table 2a. Respondents' knowledge and treatment of diarrhoeal disease

Variable	Frequency(n=90)	Percent
Does your child have diarrhoea presently?		
Yes	72	80.0
No	18	20.0
For how long has your child had diarrhoea?		
<7 days	80	88.8
7days	6	6.7
14 days	4	4.4
Have you heard about Oral Rehydration Salt?		
Yes	84	93.3
No	6	6.7
If yes, from where/whom?		
Nurse	16	17.7
Health centre	8	8.9
Individual	4	4.6
Media	10	11.1
Pharmacy	4	4.4
Hospital	38	42.2
Doctor	10	11.1
Did you give your child ORS?		
Yes	58	64.4
No	32	35.5

Table 2b. Respondents' knowledge and treatment of diarrhoeal disease

Variable	Frequency	Percent
How do you mix 1 sachet of ORS?		
With 1 litre of water	40	44.4
Others	50	55.6
Duration of use of a single mixture		
24 hours	72	80.0
Others	18	20.0
Do you have questions about the use of ORS?		
Yes	26	28.9
No	64	71.1

Table 3. Relationship between Knowledge of proper use of ORS and socio-economic class

Method of ORS preparation	Social class Upper (n%)	Middle (n%)	p-value
1 L of water	36(46.2)	4(33.3)	0.399
Others	42(53.8)	8(66.7)	

Some respondents reported using as little as 100mls of water to constitute 1 sachet of ORS. When asked the duration of use of constituted mixture, some respondents reported using the mixture for up to 4 days or until the mixture is exhausted.

The major themes in the questions respondents had concerning ORS use were how it is constituted, how it works, its benefits and its effect on the complete cessation of the diarrheal episode.

4. DISCUSSION

Oral rehydration therapy is a cost-effective life-saving intervention for children with diarrhoea. The purpose of this study was to determine mothers' knowledge and practise regarding the use of oral rehydration solution for children with diarrhoea. Mothers in this study were aware of ORS (93.3%) but their appropriate use was low. This is consistent with the report from studies [4,17,18] conducted in Low- and Middle-income Countries. The high awareness of ORS among mothers in this study can be attributed to the study group's high literacy level, as many of them held a tertiary degree. Earlier research has established a link between maternal literacy and the adoption of child survival strategies [19-21]. Additionally, because this study was conducted in an urban tertiary facility, hospital attendees are more likely to have heard about ORS from health care professionals, the media and other spheres of life.

The prevalence of ORS use was 64.4% in this study. This compares to 61.8% in a military barrack in Ibadan, Nigeria, [18] 61% in Kenya [22] and 58.2% in Assela Town, Ethiopia [23]. One possible explanation for this similarity is that all the studies were conducted in urban areas with readily available health care and information, and a sizable population of educated mothers. The prevalence of ORS use in this study was however higher than the report of 37.6% in a study in Kano, Nigeria [24] and 34.6% in Western China [25]. These studies were conducted in typical rural settings where the majority of residents are illiterate or semi-literate. This may account for the lower prevalence of ORS use.

Despite widespread knowledge, the low level of utilisation serves as a signal to further investigate the possible reasons why mothers do not give their children ORS when they have diarrhoea. A popular, but incorrect, belief is that antibiotics are the preferred treatment for diarrhoea in all situations. While antibiotics may be used to treat certain types of diarrhoea, they are not intended to treat all types of diarrhoea because most of the time, the causative agent of diarrhoea is a virus called the Rotavirus [26,27]. Another reason for preferring alternative remedies is the desire to see immediate results in terms of diarrhoeal illness resolution. Regrettably, ORS does not always significantly shorten the duration of diarrheal illness, hence the frequent use of anti-motility medications. ORS works by replacing lost fluid and preventing severe dehydration-related morbidity and mortality. It is responsible for maintaining intravascular volume throughout the course of the disease. It is occasionally associated with an increase in stool volume passed. This is typically interpreted by mothers as a worsening of symptoms, dissuading them from using the medication [28]. Adjunct therapies, such as oral zinc can shorten the duration of illness, reduce the frequency of passage of loose stools increase the interval before another diarrheal illness occurs and repair the intestinal walls [29]. A systematic review of literature by Lenters et al, revealed that the administration of ORS with zinc was associated with a higher uptake of ORS [30].

Only 44.4% of respondents in this study had good knowledge of the proper way to constitute and use ORS. This is comparable to the findings of Okoh and Alex Hart, [31] and Adimora et al, [32] who discovered that only 33.8% and 39.4% of their respondents, respectively, could manage diarrhoea correctly at home. The prevalence of incorrect practice noted in this study is concerning, given the high literacy level of the mothers and the report of receiving their information from health workers. Another possible explanation for this disparity may be the father's influence on decision-making in the home. This effect of which may outweigh the impact of maternal literacy [19].

Majority of mothers (84.3%) in this study learned about ORS from a health care worker or health facility. This is consistent with the findings of Omole et al, [33] who conducted a similar study in Kaduna state, Nigeria, among 350 mothers. This data is critical for future health awareness planning. Assuring that health care workers are strategically positioned to provide accurate information at all times will result in improved caregiver practise. Creating 'oral rehydration corners' in hospitals is one way to increase awareness and proper practise. A location where all pertinent information about the use of ORS is disseminated and practical demonstrations are conducted. Additionally, caregivers are educated about the potentially harmful effects of inappropriate ORS use [34]. This has been implemented in a few hospitals and has resulted in an increase in proper ORS administration.

In general, this study found out that mothers were aware of ORS, used it moderately, and mostly inappropriately.

5. CONCLUSION

Mothers' knowledge of proper usage of ORS is deficient. This is unfortunate given that oral rehydration therapy has been proven to be effective for more than 30 years. Health care workers are the ideal primary source of information and are critical for future public health interventions aimed at addressing the know-do gap in the practise of oral rehydration therapy. Continuous advocacy by health care providers, the use of adjunctive therapies such as oral zinc, and the establishment of ORS teaching corners in health facilities are all measures that have the potential to increase ORS utilization.

LIMITATIONS OF STUDY

The study limitations include a small sample size and a tendency for respondents to provide socially desirable responses owing to the interviewer-administered approach used to collect data. Additionally, a community-based study may provide additional information, as a large proportion of uncomplicated diarrheal illnesses are likely to be managed at home by mothers in a low- and middle-income country like Nigeria.

DISCLAIMER

The products used for this research are commonly and predominantly used products in our area of research and country. This research is conducted not as an avenue for litigation but for the advancement of knowledge. Also, no funding for this research was obtained from the producing company rather it was funded by the personal efforts of the authors.

CONSENT

Informed consent was obtained from respondents. The mothers were assured of strict confidentiality of the information given.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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