

UTILIZATION OF ORAL REHYDRATION THERAPY IN MANAGEMENT OF INFANTILE
DIARRHEA AMONG MOTHERS ATTENDING BULA-BULIN COMPREHENSIVE HEALTHCARE
CENTER, NGURU, YOBE STATE, NIGERIA

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Abstract

Oral Rehydration Therapy (ORT) is a type of fluid replacement therapy used to prevent and treat dehydration. This study assessed Utilization of Oral Rehydration Therapy in management of infantile diarrhea among mothers of attending Bula-Bulin comprehensive healthcare center, Nguru, Yobe State, Nigeria. Descriptive survey research design was used for this study. The study population consisted of 1302 mothers. Simple Random Sampling technique was used to select a sample of 130 respondents for the study. 15-item questionnaire was used as research instrument for data collection. Frequency counts and percentages were used to analyze demographic information of the respondents and to answer the research questions. Finding of the study revealed that majority of the respondents utilize Oral Rehydration Therapy in management of infantile diarrhea. It also revealed that fear of hypernatremia, parental preference, time, misconception and cost are barriers to utilization of ORT among the respondents. It was recommended that Health Education on Oral Rehydration Therapy should be planned and implemented, and that Government should provide free conventional Oral Rehydration Solution to mothers with children passing Acute Watery Diarrhea.

Keywords: Utilization, Oral-Rehydration-Therapy, Infantile Diarrhea and Mothers

Introduction

Oral Rehydration Therapy (ORT) is a type of fluid replacement used to prevent and treat dehydration from diarrhea-related conditions. In this therapy, children are given a solution to make up the salt-water deficits and to replenish lost nutrients. The therapy is usually achieved through the use of Oral rehydration solution (ORS); which is an oral powder-containing mixture of glucose, sodium chloride, potassium chloride, and sodium citrate (United State Agency for International Development, (USAID), 2010). The World Health Organization's (WHO) definition of Oral Rehydration Therapy includes Oral Rehydration Salt (ORS) solution, Recommended Home Fluids (RHF) also known as Salt-Sugar-Solution (SSS) and breastfeeding (Agbolade, Dipeolu & Ajunwu, 2015). It begins at home with home fluids or a home-prepared salt and sugar solution at the first sign of diarrhoea to prevent dehydration. The practice has been in existence in the developing world since late 19th Century. It involves the use of balanced electrolyte solutions with glucose to reverse dehydration and maintain hydration during diarrhea. With increase in understanding the process and effects of diarrhea, establishment of feeding and early nutrition have become an integral part of Oral Hydration Salts (ORS) solution therapy (Sarangi, Mohanty & Kadam, 2019).

Standard ORS solution has 90 mEq/L of sodium, 20 mEq/L of Potassium, 30 mEq/L of bicarbonate or 10 mEq/L of tribasic sodium citrate, 80 mEq/L of chloride and 111 mmol/L of glucose. The citrate ORS has an Osmolarity of 311 mOsm/L²⁴. Measured in grams, the standard ORS solution contains 3.5 gms of sodium chloride, 1.5 gms of Potassium chloride, 2.9 gms of Sodium citrate and 20 gms of anhydrous/Mon hydrous glucose which, when dissolved in one liter of water, gives the desired concentration of solutes (Sarangi, Mohanty & Kadam, 2019). This single formulation was recommended by WHO and UNICEF for more than 44 years to treat and prevent dehydration from diarrhea of any aetiology including cholera and in individuals of any age (Murugaiah, Palasuberniam, Falah, & Al-talib, 2016). Used according to recommended guidelines, with ready access to plain water or breast feeding during oral rehydration, it was proved to be effective in both prevention and treatment of dehydration due to any cause (Sarangi, Mohanty & Kadam, 2019).

Beside the standard ORS, food -based ORS such as rice-based ORS can also be use as rehydration therapy for the management of cholera and other diarrhea-related morbidities. Rice-based ORS contains cooked long-chain rice carbohydrate powder instead of the glucose or combined cooked rice with WHO-ORS is found to be more effective than glucose ORS (Murugaiah, Palasuberniam, Falah, & Al-talib, 2016). Despite the success of Oral Rehydration Therapy (ORT), its proven efficacy and recommendations for use by various organizations, studies show that ORT continues to be underused globally, with higher level of underuse among mothers living in rural areas. A recent report showed that ORT is being delivered to only 20% of the world's children who could benefit and that widespread use could prevent 15% of deaths among children under five years (Agbolade, Dipeolu & Ajunwu, 2015). Postulated reasons for underuse include the fear of inducing iatrogenic hyponatremia, time requirements, questionable efficacy in moderate dehydration, and parental preference (Agbolade, Dipeolu & Ajunwu 2015).

Diarrhoeal diseases remain one of the leading causes of preventable death, especially among children aged under-five years in developing countries (Yilgwan and Okolo, 2012). Global mortality estimates from diarrhoea and its complications range from 1.5 to 5.1 million deaths per year for children under the age of five (Karambu, MatiruZ, Kiptoo, & Oundo, 2013). Eight out of ten of these deaths occur in the first two years of life (Mengistie, Berhane & Worku, 2013). On the average, children below years of age in developing countries experience three episodes of diarrhoea each year. In many countries, diarrhoea including cholera is also an important cause of morbidity among older children and adults, (Agbolade, Dipeolu and Ajunwu 2015). Frequent or prolonged diarrhoea can lead to poor nutritional status, and repeated episodes of diarrhoea can also leave children susceptible to other infections. Furthermore, malnutrition can increase the severity, duration, and frequency of bouts of diarrhoea, (Mengistie, Berhane & Worku, 2013).

Management of diarrhea by replenishing the lost body fluid through Oral Rehydration Therapy (ORT) is a simple, affordable, and effective intervention that significantly reduces diarrhea-related mortality and morbidity (Dubey, 2019). In the 1970s, WHO developed a simple, inexpensive iso-osmotic (311 mOsm/L) formulation of glucose-based Oral Rehydration Salts (ORS) to correct dehydration and metabolic acidosis in the setting of acute diarrhea (Dubey, 2019). Since the introduction of ORS, the global annual mortality rate for children suffering acute diarrhea and dehydration has dropped from 5 million to 0.5 million, and ORS remains the cornerstone of therapy for dehydration secondary to acute infectious diarrhea (Binder, 2014). Despite the ready availability of ORS, mortality rates in developing countries still remain relatively high, with 102,813 children <5 years of age reported to have died from diarrhea in 2016, a mortality rate of 4.1 per 1000 live births in a country like India (Binder, 2014). It has been reported that managing diarrhoea at home is quite common among mothers of under-five children especially in the rural areas, however, their level of knowledge on the use of ORT is poor (Ansari, Ibrahim & Shankar, 2012). Few studies carried out on home management of diarrhoea in Nigeria have shown an unsatisfactory level of usage of ORT and poor home management of childhood diarrhoea (Okoh and Alex-Hart, 2014). Therefore, mothers of under-five children's poor use of ORT in the management of diarrhoea are a contributory factor to child morbidity and mortality. Despite universal popularity of Oral Rehydration Solution (ORS) in preventing dehydration due to diarrhoea, its use in practice is very low in rural areas (Ogunrinde, Raji, Owolabi, & Anigo, 2012). Under-utilization is further complicated by incorrect preparation of ORS which is related to lack of mothers' prior experience due to number of births. Unfortunately, millions of children die every year due to failure to replace fluid effectively (Mengistie, Berhane & Worku, 2013).

Postulated reasons for underuse include the fear of inducing iatrogenic hyponatremia, time requirements, questionable efficacy in moderate dehydration, and parental preference (Agbolade, Dipeolu&Ajunwu 2015). A study conducted by Gogoi and Chamuah (2020) on Barriers Towards the Practices of Oral Rehydration Therapy in the Management of Diarrhoea Among the mothers of Under Five Children Pediatric Outpatient Department of Guwahati Medical College and Hospital, Assam, India, revealed that there was a significant difference in barriers to use of Oral Rehydration Therapy among mothers of different parity attending the pediatrics OPD of the hospital. Previous study has reported that mothers have high knowledge of diarrhea but utilization of ORT in the treatment of diarrhea cases was low(Kalu, Jimmy, & Emma, 2016). That therefore indicates that mothers are aware of the effectiveness of ORT in treatment and prevention of diarrhea, but utilization as expected is absent. A cross-sectional study carried out in Enugu State, Nigeria, reported that utilization of ORT in management of diarrhea among mothers varied with parity. It revealed that 65.7% of mothers with used ORS in the treating childhood diarrhea, which was attributed to the number of children they have and previous experience in diarrhea management, (Chudi, Ebube & Chinwe, 2011).

Gao, Yan, Wang and Dang (2013), also reported in their study that about 34.6% of nursing mothers, who have more than two children, utilized ORS at home with high level of perfection. An intervention study carried out in Mexico showed that about 66% of mothers have more than two children and used Rice-based gruel effectively in managing infantile diarrhea, (Martinez, Bojalil, & Guiscafr, (2013). A household survey in Guinea-Bissau also observed that mothers had good knowledge of ORS and only 58% of diarrhoea episodes were treated with ORS. The high utilization rate was attributable to level of mothers' education, marital status and number of births given (Saurabh, Shidam, Sinnakirouchenan, Subair, Hou, & Roy, 2014). It is therefore against this background that this study assessed Utilization of Oral Rehydration Therapy in Management of Infantile Diarrhea among Mothers Attending Bula-bulin Comprehensive Healthcare Center, Nguru, Yobe State, Nigeria.

Research Objectives

The objectives of this study are to assess:

- i. Utilization of Oral Rehydration Therapy in Management of Infantile Diarrhea among Mothers of different Parity Attending Bula-Bulin Comprehensive Healthcare Center, Nguru, Yobe State, Nigeria.
- ii. Barriers to Utilization of Oral Rehydration Therapy in Management of Infantile Diarrhea among Mothers Attending Bula-Bulin Comprehensive Healthcare Center, Nguru, Yobe State, Nigeria.

Research Questions

The following research questions were answered:

- i. Do Mothers Attending Bula-Bulin Comprehensive Healthcare Center, Nguru, Yobe State, Utilize Oral Rehydration Therapy in Management of Infantile Diarrhea?
- ii. Are there Barriers to Utilization of Oral Rehydration Therapy in Management of Infantile Diarrhea among Mothers Attending Bula-Bulin Comprehensive Healthcare Center, Nguru, Yobe State, Nigeria?

Methodology

Descriptive survey research design was used for this study. The design deals with the study of a group of people by collecting and analyzing data from only few people considered to be representative of the entire group (Krosnick, 2015). The design was suitable for the study because it allowed for sampling and making inference. This study was conducted at Bula-Bulin, Comprehensive Healthcare center, Nguru, Yobe State, Nigeria. The facility is situated within Bula-Bulin ward in Nguru Metropolis of Yobe State, Nigeria. It offers healthcare services to residents of Nguru and environs. The study population consisted of 1302 mothers (513 mothers that come for Antenatal Care (ANC) and 789 mothers that come for Postnatal Care (PNC) and Expanded Programme on Immunization (EPI)) services of the facility. Simple Random Sampling technique was used to select a sample of 130 (10%) mothers (comprising 51 mothers that come for ANC and 79 mothers that come for PNC and EPI for the study. Research instrument used for this study was a 15-item self-developed and categorical questionnaire. The questionnaire was divided into three (3) sections: section A sought data on demographic characteristics of the respondents; section B sought data on utilization of Oral Rehydration Therapy in Management of Infantile Diarrhea, while section C covered data on barriers to practicing Oral Rehydration Therapy in Management of Infantile Diarrhea among the respondents. Data were collected by the researchers with the help of research assistant. Respondents who could not read and write were asked questions and allowed to respond as appropriate, while literate respondents were assisted with interpretation, where necessary, and allowed to select the right options. Data on socio-demographic characteristics of the respondents, Utilization of and barriers to Oral Rehydration Therapy in Management of Infantile Diarrhea were analyzed using frequency counts and percentages.

Results

Results of this study are presented Below:

Table 1: Demographic Characteristics of Respondents

S/N	Variable	Frequency	Percentage
1.	Age (in years)		
	a) 15 -25	28	21.5
	b) 25-35	60	46.2
	c) 35-45	42	32.3
2.	Educational Qualification		
	a) None	46	35.4
	b) Quranic	20	15.4
	c) PSLC	14	10.8
	d) SSCE	16	12.3

	e) Tertiary School Certificate	34		26.2
3.	Occupation			
	a) House wife	72		55.4
	b) Trader/businesswoman	47	36.2	
	c) Civil servants	9	6.9	
	d) Others	2	1.5	
4.	Parity			
	a) 1-3	52	40	
	b) 4-6	50	38.5	
	c) Above 6	28	21.5	
5	Marital Status			
	a) Single	9	6.9	
	b) Married	102	78.5	
	c) divorced	12	9.2	
	d) widowed	7	5.4	

Table 1 above contains demographic information of the respondents. The table indicates 28(21.3%) respondents were between the age range of 15-25 years, 60(46.2%) respondents were within the age range of 25-35 years, and 42(32.3%) respondents were within the age range of 35-45 years. This therefore indicates that majority of the respondents were within the age range of 25-35 years. The table also indicates that 46(35.4%) respondents do not have any sort of educational qualification, 20(15.4%) respondents attended Qur'anic school, 14(10.8%) respondents had Primary School Leaving Certificates, 16(12.3%) respondents had Secondary School Certificates, and 34(26.2%) respondents have tertiary School Certificates. This therefore shows that majority of the respondents attended Quranic schools. It further indicates that 72(55.4%) respondents were housewives, 47(36.2%) respondents were traders/businesswomen, 9(6.9%) respondents were civil servants and 2(1.5%) respondents were into other occupations. This indicates that majority of the respondents were housewives. Furthermore, the table reveals that 52(40%) respondents had 1-3 number of births, 50(38.5%) respondents had 4-6 number of children, and 28(21.5%) respondents had more than 6 number of children. This implies that majority of the respondents had 1-3 number of children. The table also reveals that 9(6.9%) respondents were single, 102(78.5%) respondents were married, 12(9.2%) respondents were divorced, and 7(5.4%) respondents were widowed. This therefore shows that majority of the respondents were married.

Research Question 1: Do Mothers Attending Bula-Bulin Comprehensive Healthcare Center, Nguru, Yobe State, Nigeria Utilize Oral Rehydration Therapy in Management of Infantile Diarrhea?

Table 2: Utilization of Oral Rehydration Therapy (ORT) in Management of Infantile Diarrhea

S/N	Responses	Variables	
		Agreed	Disagreed
1.	ORT commences immediately diarrhea is noticed in infants	123(93.9%)	7(5.3%)
2.	One liter of water per measure of SSS or ORS is used for ORT	124(94.7%)	6(4.6%)
3.	ORT is used to provide sugar and salt needed to prevent dehydration due to diarrhea	126(96.2)	4(3.1)
4.	ORT is used to replace lost electrolytes due to diarrhea in children	118(90.1%)	12(9.2%)
5.	ORT is administered after every stool in managing infantile Diarrhea	90(68.7%)	40(30.5%)

Table 2 contains information on utilization of Oral Rehydration Therapy by the respondents. It shows that 123(93.9%) respondents agreed that ORT commences immediately diarrhea is noticed in infants while 7(5.3%) respondents disagreed. It also shows that 124(94.7%) respondents agreed that one liter of water per measure of Sugar-Salt-Solution or ORS is used for ORT while 6(4.6%). It further reveals that 126(96.2) respondents agreed that ORT is used to provide sugar and salt needed to prevent dehydration due to diarrhea while 4(3.1) respondents disagreed. Furthermore, the table indicates that 118(90.1%) respondents agreed that ORT is used in replacing lost electrolytes due to diarrhea in children while 12(9.2%) respondents disagreed. The table also indicates 90(68.7%) respondents agreed that ORT is administered after every stool in managing infantile diarrhea while 40(30.5%) respondents disagreed. This therefore implies that majority of the respondents utilizes ORT properly.

Research Question 2: Are there Barriers to Utilization of Oral Rehydration Therapy in Management of Infantile Diarrhea among Mothers Attending Bula-Bulin Comprehensive Healthcare Center, Nguru, Yobe State, Nigeria?

Table 3: Barriers to Oral Rehydration Therapy (ORT) in Management of Infantile Diarrhea

S/N	Variables	Responses	
		Agreed	Disagreed
16.	Fear of induced hypernatremia deter the use of ORT	71(54.2%)	59(45.0)
17.	Parental preference deters me from using ORT	83(63.4%)	47(35.9%)
18.	Time requirement for preparation of ORS hinders the use of ORT	80(61.1%)	50(38.2)
19.	Misconception deters using ORT in management of infantile diarrhea	94(71.8%)	36(37.5%)
20.	Cost is the main factor that discourages the use of ORT	55(42%)	75(57.3%)

Table 3 contains information on barriers to ORT among the respondents. It shows that 71(54.2%) respondents agreed that fear of induced hypernatremia deter the use of ORT in management of infantile diarrhea while 59(45.0) respondents disagreed. It also indicates that 83(63.4%) respondents agreed that parental preference deters them from using ORT while 47(35.9%) respondents disagreed. The table further reveals that 80(61.1%) respondents agreed that time requirement for preparation of ORS hinders using ORT in management of infantile diarrhea while 50(38.2) respondents disagreed. Furthermore, it reveals that 94(71.8%) respondents agreed that misconception deters them from using ORT in management of infantile diarrhea while 36(37.5%) respondents disagreed. The table further indicates that cost is the main factor that discourages the use of ORT in management of infantile diarrhea. This therefore indicates that fear of inducing hypernatremia, parental preference, time required in preparation of ORS, misconception and cost are the main barriers to Oral Rehydration Therapy in management of infantile diarrhea by mothers in the study area.

Discussion

This study was conducted to assessed utilization of Oral Rehydration Therapy in Management of Infantile Diarrhea among Mothers Attending Bula-Bulin Comprehensive Healthcare Center, Nguru, Yobe State, Nigeria. Finding of the study revealed that majority of the respondents were within the age range of 25-35 years, attended Quranic schools, were housewives, had 1-3 number of children and were married. It revealed that majority of mothers attending the healthcare facility employ Oral Rehydration Therapy immediately diarrhea is noticed in infants, use one liter of water per measure of Sugar-Salt-Solution or ORS used for ORT, utilize ORT to replace lost electrolytes due to diarrhea in children, and administer ORT after every stool in managing infantile diarrhea. That is to say, mothers attending the clinic utilize Oral Rehydration Therapy in management of infantile diarrhea properly. This finding is in line with a cross-sectional study carried by Chudi, Ebube and Chinwe, (2011) in Enugu State, Nigeria, which revealed that mothers demonstrated better utilization of ORT and ORS in management of infantile diarrhea; which was attributed to previous experience. It also corroborates that of an intervention study carried by Martinez, Bojalil, & Guiscafr (2013) in Mexico which revealed utilization of Rice-based gruel (ORT) for management infantile diarrhea was properly employed by mothers in combatting dehydration due to diarrhea. It was also in line with opinions of Saurabh, Shidam, Sinnakirouchenan, Subair, Hou, & Roy, (2014) that high utilization rate of ORT in management of infantile diarrhea is attributable to level of mothers' education, marital status and number of births given.

Furthermore, finding of this study revealed that fear of induced hypernatremia, parental preference, time requirement for preparation of ORS, misconception and cost are the main barriers to ORT in management of infantile diarrhea. This finding supports that of a study conducted by Gogoi and Chamuah (2020) on Barriers Towards the Practices of Oral Rehydration Therapy in the Management of Diarrhoea Among the Mothers of Under Five Children Pediatric Outpatient Department of Guwahati Medical College and Hospital, Assam, India, which revealed that common barriers to utilization of Oral Rehydration Therapy among mothers attending the pediatrics Outpatient Department of the hospital are cost, accessibility, time and preference. Also, the finding was in line with the opinions of Agbolade, Dipeolu&Ajunwu (2015) that barriers to utilization of Oral Rehydration Therapy such as access and knowledge exist among mothers, but is commonly influenced by number of supportive network present.

Conclusion

Based on findings of the study, it was concluded that majority of mothers of children under the age of five years attending Bula-Bulin comprehensive healthcare center in Nguru metropolis of Yobe state, utilize Oral Rehydration Therapy properly in managing infantile diarrhea; and that fear of induced hypernatremia, parental preference, time requirement for preparation of ORS, misconception and cost are barriers utilization of ORT.

Recommendations

Based on findings of the study, the following recommendations were made:

- i. Health Education on preparation, uses and effectiveness of Oral Rehydration solution used for ORT should be planned and implemented by stakeholders in health programme working at the study area.
- ii. Government should provide free conventional Oral Rehydration Solution to mother of children under the age of five years that reported cases of infantile diarrhea.

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