



Research

Assessment of Mothers' Knowledge and use of Oral Rehydration Therapy for Diarrhoea in Children under 5 Years in Ife, Nigeria

¹Oruikor GJ, ²Durotoye MP

¹University of Parakou, Republic of Benin: Department of medicine, faculty of medicine; Institute of Health Science, Research and Administration of Nigeria: Department of Research.

²Institute of Health Science Research and Administration: Department of Research

Corresponding author: Oruikor Gabriel Jeremiah, University of Parakou, Republic of Benin: Department of medicine, faculty of medicine; Institute of Health Science, Research and Administration of Nigeria: Department of Research.; oruikorgabriel@gmail.com; +2348132030519

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Abstract

Background: Diarrhoea disease is the second leading cause of death in children under 5 years old, and is responsible for killing about 300, 000 children annually in Nigeria. Oral rehydration therapy (ORT) is the preferred treatment for fluid and electrolyte losses due to diarrhoea in children with mild to moderate dehydration. This study aimed to assess the knowledge and use of ORT in the management of diarrhoea in children under 5 years at Seventh Day Adventist Hospital (SDAH, Ife).

Method: A structured questionnaire was adopted for this study design and data was collected using a self-structured questionnaire both self-administered and interviewer administered.

Results: Of 80 participants, 44 (55%) of the respondents had heard of ORT before this study, while 36 (45%) had not. 48 (60%) responded that they use oral rehydration solution while 32 (40%) of mothers said they had not used ORT. There was significant difference in both outcomes. The result revealed that there was significant difference in morbidity and mortality between mothers who use ORT and those who do not. But there was no significant difference between the knowledge of ORT compared with its use.

Conclusion: Appropriate knowledge of the therapy will positively influence its use which will drastically prevent morbidity associated with diarrhoea as well as contain the incidence of mortality.

Keywords: Mother, Child, ORT, Knowledge, Diarrhea, Dehydration, Management, Acceptance

Introduction

Diarrhoea is one of the major causes of infant and young children morbidity and mortality globally. It is characterized by passing of more than 3 watery stools within 24 hours which is accompanied by loss of body fluids and electrolytes leading to dehydration and death if not treated.¹

Brunner and Suddart² defined diarrhoea as an increased amount of stool (more than 200g/day) and altered consistency (i.e. increased liquidity of stool). Diarrhoea is a disease of the gastrointestinal tract, characterized by abdominal fluidity and frequently of fecal evacuation, three or more or at least one bloody stool in a 24 hours' period. It is not unusual to also find mucus in the stool.² 1.8 million Child deaths recorded annually are of diarrhoea related diseases.³ In Nigeria about 300,000 children were recorded annually and majority of the death are of diarrhoea related diseases. Therefore, diarrhoea is considered as 3rd leading cause of death of children below the age of five making up to 16% of child mortality recorded annually in the country.⁴ Studies had revealed every episode of diarrhoea recorded to be accompanied by deprivation of body's nutritional status and predispose a child to malnutrition and nutritional deficiencies related diseases.⁵

Diarrhoea can be classified based on duration and pathophysiology. According to Ashley⁶ diarrhoea can be caused by a number of factors. The most common cause of diarrhoea includes: infection, osmotic diarrhoea and secretory diarrhoea.

Mustapha⁷ describes the pathophysiology when causative organisms gain entrance into the gastrointestinal tract; they irritate or even inflame the tract. The toxin produced by these organisms irritates the nerve endings in the mucosal leading to mild or severe abdominal cramp makes the child restless. The irritation of the gastric mucosa by the bacteria and toxin may cause vomiting while the inflammation of the intestinal mucosa, the bacteria enterotoxin cause release of excessive amount of fluid and electrolytes by the small intestine leading to frequent passage of explosive watery offensive stool called diarrhoea. Large volumes of water are normally secreted into the small intestinal lumen, but a large majority of this water is efficiently absorbed before reaching the large intestine. Diarrhoea occurs when secretion of water into the intestinal lumen exceeds absorption.

Clinical Manifestation including cramping, abdominal pain, bloating, nausea, urgent need to use the restroom, dehydration, incontinence, weight loss, dry, sticky mouth, high fever, loss of appetite for liquid, frequent vomiting and extreme thirst.

Diarrhoea disease may have a negative impact on both physical fitness and mental development. Diarrhoea can cause electrolyte imbalances, renal impairment, dehydration, and defective immune system responses.⁸ Some of the factors that have been identified as risk factor for diarrhoea are: personal hygiene by care givers, environmental hygiene, age, early weaning, seasonal patterns, low maternal education, lack of piped water supply, young maternal age, medication etc.⁹

Prevention of Diarrhoea may include: Proper breast-feeding introduction and exclusive breastfeeding, personal hygiene and environmental sanitation, food hygiene, washing of hands before and after defecation, Proper child health education of mothers and health care givers, early detection and diagnosis of signs and symptoms of diarrhoea and simple treatment medication and immunization.

However, it is pertinent to know that diarrhoea can be prevented and treated as well if the incident happens. Oral rehydration therapy (ORT) is a medical treatment of childhood diarrhea; it is a solution containing salt and sugar solution and it is made to replace the body's fluids lost during diarrhea because the main effect of diarrhea fluid and electrolyte loss resulting in dehydration and even death.¹⁰

ORT consist of two treatment which include oral rehydration solution (ORS) and salt sugar solution which play a vital role in retarding and regulating electrolyte imbalance and as well prevent the aforementioned complications and co-morbidities associated with diarrhea and severe dehydration.^{11,12} Diarrhoea is not lethal itself, the improper knowledge, poor practice and negative attitudes of mothers and their misdirected approach towards its management and prevention leads to high degree of severe dehydration and lastly death.^{13,14}

A previous studies conducted in northern and southern part of Nigeria indicated a wide bridge on knowledge and ORT usage in the management of childhood diarrhoea among mothers and caregivers.^{15,16,17}

Therefore, the current study was conducted to assess the knowledge and usage of ORT in the management of childhood diarrhoea among mothers of under 5years old children resident in Ile Ife; a suburb of Osun state Nigeria.

The Health Belief Model (HBM) is a tool used in this study as the conceptual framework; to try and predict health behaviors. It is a model based on the theory that a person's willingness to change their health behaviors is primarily due perceived susceptibility, perceived severity, perceived benefits and perceived barriers.

In related empirical studies, it was revealed that more than average of the population was knowledgeable about the therapy as indicated by describing the treatment correctly, recognizing the packet or reciting the home recipe, although areas of knowledge deficits include prevention of dehydration and where the ORT packets could be purchased.¹ Another study revealed that all the mothers had adequate knowledge and awareness on ORT. Areas of knowledge deficit was on the preparation of ORS.¹⁸

Method

The setting: This descriptive cross-sectional study was conducted in Seventh Day Adventist Hospital (SDAH), Ife, Osun State Nigeria. "Ife (Yoruba: Ife, also Ilé-Ife) is an ancient Yoruba city in south-western Nigeria. The current population of Nigeria in 2023 is 220,720,053 as of Friday, May 12, 2023. Ife is within the population of over 500,000 people, which is the highest in Osun State. Founded in 1940, the Seventh-day Adventist Hospital Ile-Ife, Ile-Ife, Osun State, Nigeria has about 155 patient beds. The hospital has given birth to the SDA School of Nursing, the midwifery school and the SDA College of Health Technology. The latter was established and commissioned on January 1, 2020, and started with four departments: (a) Community Health, (b) Pharmacy Technicians, (c) Health Information Management, and (d) Medical Laboratory Science Technicians. The new institution is located on the campus of the Seventh-day Adventist Hospital, Ile-Ife, Osun State, Nigeria.

Design: This study is a descriptive cross-sectional methodology carried out by random selection from the study population.

Population: The study population comprised of 150 mothers with children who had come for consultation at SDAH, Ife; within the study duration of two weeks. All mothers who came to seventh days Adventist Hospital Ife with children having diarrhoea under five years during the study period; were included in this study. Mothers with children who did not fit these criteria were excluded from the study.

Sample size: A sample of 80 respondents were drawn randomly to represent the entire population study.

Sample methodology: The respondents were selected by simple random sampling method of the mothers of under 5years children with diarrhoea who attended the paediatric unit of SDAH ile-ife within a period of two weeks, which was the duration of the survey.

Study variables: The questionnaire was divided into four sections for ease of administration namely socio-demographic characteristics, knowledge of ORT, level of use and non-use of ORT including the reasons for

non-use of ORT and outcomes and consequences of the use and non-use of ORT in under 5 years children. Prior to its administration, the questionnaire was field-tested to assess clarity of the questions and respondents' ability to understand them.

Study instruments: A self-structured questionnaire was developed and used by the researcher. The questionnaire was both self-administered and interviewer administered.

Data collection: Collection of data was carried out by a biological science student of St. Monica University Buea Cameroon. Responses on the questionnaire were recorded and entered into MS Excel version 2016 for analysis. The questions were based on "yes or no, and specify/explain to establish the significant relationship between knowledge and use of Oral Rehydration Therapy of mothers in the management of diarrhea in children under 5years in SDAH, Ife. Descriptive statistics of socio-demographic variable, knowledge, use of ORT were presented as percentages. Other information for this research were gotten from thesis, journals, and the internet.

Data analysis: Data collected from respondents were analyzed using data frequency table to show distribution of scores as well as their percentages. Chi square was used for the predicate of ORT use and knowledge.

Ethics and permission: The researcher presented an informed consent form to the hospital management, precisely the Human Resource Department; to obtain permission in order to carry out the study. Same was signed by a staff in the mentioned department, on the 27th of May, 2023 and this served as ethical approval and permission to carry out the study. The respondents were given full information about the study of which the researcher sought and got verbal consents from the respondents before engaging them in the research.

Results

The data gathered are presented as simple percentages while the chi square test was adopted to test the research hypothesis.

Socio demographic data reveal the educational level of the respondents to be 5 (6.25%) with no formal educational background, 14 (17.5%) were Primary level holders, 27 (33.75%) were Secondary level holders and. 30 (37.5%) were Tertiary level holders. 4 (5.0%) had other type of educational qualifications. This implies that larger percentage of respondents are literates who could read and understand the content of the questionnaires before adopting a response.

Occupation of the respondents used for this study were reported to be 5 (6.25%) in farmer occupation, 26

(32.5%) were traders, 39 (48.75%) were civil servants while 10 (12.5%) have other type of occupations. None was reported to be in business.

Socio demographic data also show that the religion of the respondents were 41 (51.25%) Christians, 36 (45.0%) Islam and 3 (3.75%) are traditional Religion. Only 1 (1.25%) represented other religions.

Ethnicity of respondents used for the study revealed to be 8 (72.5%) Yorubas, 17 (21.25%) were Igbos, 2 (2.5%) of the population under study were Hausas while 2 (2.5%) were Fulanis. The age range distribution of the mothers were: 27 (33.75%) within the age the range of 20-30years. 33 (41.25%) respondents were between 31-40years. 13 (16.25%) between 41-50years, 5 (6.25%) were between 51-60years and 2 (2.5%) respondents were above 60years.

The age distribution of children was revealed to be 19 (23.75%) within the range of 0-1 years. 35 (43.75%) within the range of 2-3 years and 26 (32.5%) were of 4years.

As far as knowledge of mothers regarding knowledge of oral rehydration solution was concerned, of 80 mothers; 44 (55%) responded that they had heard of oral rehydration solution while 36 (45%) of mothers said they had not heard of ORT.

Table 1: Distribution of the Study Population based on their Knowledge on ORT

Do you know what ORT is?	Frequency (N=80)	Percentage (%)
Yes	44	55
No	36	45
Total	80	100

In calculation, X^2 was 4.64 at df 1 of p value 0.05 and critical value was 3.84. The alternative hypothesis was accepted. That is, there is significant difference between mothers who have the knowledge of ORT compared to mothers who do not have the knowledge.

The result for the use and non-use of ORT of oral rehydration solution, of 80 mothers; 48 (60%) responded that they use oral rehydration solution while 32 (40%) of mothers said they had not ORT.

Table 2: Distribution based on the use of ORT

Do you use ORT for your under 5 years children with diarrhoea?	Frequency N=80	Percentage (%)
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Yes	48	60
No	32	40
Total	80	100

X^2 calculated is 6.56 of df 1 at p value 0.05 and critical value of 3.84. Therefore, the alternative hypothesis was accepted. Thus, there is significant difference between mothers who use ORT compared to mothers who do not use therapy.

Concerning the outcome and consequences of use or non-use of ORT in the management of diarrhoea in children under 5years; Out of the 80 participants in which 48 respondents used ORT, 38 exhibited various morbidity such as severe weight loss 7 (18.42%), worsened malnutrition 6 (15.79%) and various other impact was reported to be 25 (50%); which included hospitalization. Out of the 38 participants; 30 (78.95%) children were hospitalized and confined for 0-7 days while 8 (21.05%) were confined for 8-14 days. Mortality was reported as 2 (20%) on arrival while 8 (80%) died while on hospitalization.

For the outcome and consequence of non-use of ORT, out of 32 participants that did not accept the use of ORT; 8 participants (25%) reportedly had worsened malnutrition, severe weight loss was reported for 6 (18.75%) while other outcome was 6 (6.5%) of the respondents. Hospital stay of 0-7 days was reported for 6 (37.5%) out of 16 participants. 10 (37.5%) of the 16 reportedly died. Mortality was reported to be 2 (12.5%) for death at home and 4 (25%) was reported to have died on arrival while 10 (62.5%) died in the hospital.

Table 3: Distribution of the study population based on the outcome and consequences of the use and non-use of ORT

	Freq.	Percent (%)
Morbidity as consequence of the use of ORT		
Coma	0	0
Severe weight loss	7	18.42
Worsened malnutrition	6	15.79
Others	25	65.79
Total	38	100
Mortality as consequence of the use of ORT		
Died at home	0	0
Died on arrival	2	20
Died in the hospital	8	80
Total	10	100
Grand total	48	
Morbidity as consequence of non-use of ORT		

Coma	0	0
Severe weight loss	6	18.75
Worsened malnutrition	8	25.00
Others	6	6.25
Total	24	100

Mortality as consequence of non-use of ORT		
Died at home	2	12.50
Dead on arrival	4	25.00
Died in the hospital	10	62.50
Total	16	100
Grand total	32	

Table 4: Cross tabulation for use and non-use of ORT and the consequences of morbidity and mortality

	Mortality	Morbidity	Total	X ²	df	p-value 0.05
Use of ORT	10	38	48			
Non-Use of ORT	16	24	40			
Total	26	62	88	33.76	1	3.84

X² 33.76 df 1 p value 0.05 and critical value of 3.84. Therefore, the alternative hypothesis is accepted which means that there is significant difference in Morbidity and mortality between mother who use ORT and those who do not.

Table 5: Cross tabulation of knowledge of mothers on ORT and the use of ORT

	Yes	No	Total	X ²	df	p-value 0.05
Knowledge of ORT	44	36	80			
Use of ORT	48	32	80			
Total	92	68	160	0.41	2	0.05

X² is 0.41 df 1 with p value 0.05 and critical value 3.84. Therefore, accept the null hypothesis that there is no significant difference between the knowledge of ORT compared with its use.

Discussion

This study reveals that 55% of the study population had knowledge about Oral Rehydration Therapy. This is consistent with a research study on mother's knowledge of ORT and its usage in Ibadan Metropolis, Nigeria which revealed that more than average of the population was knowledgeable about the therapy as indicated by describing the treatment correctly, recognizing the packet or reciting the home recipe, although areas of knowledge deficits include prevention of dehydration and where the ORT packets could be purchased.¹

According to related empirical study,¹ majority of the respondents in their study have knowledge on use of ORT in the management of childhood diarrhoea. On the basis of this findings on respondents' knowledge about ORT this share similarities with the previous studies conducted within and outside Nigeria.^{19,7,20,21} Similarities of these studies indicated diarrhoea is a disease of public health importance affecting under-five children in developing countries where these studies were conducted, and mothers attempted use of ORT to treat their child diarrhoea.

The major reasons for non-use of ORT was revealed in the current study to be because most mothers (45%) had no knowledge of ORT while other reasons includes unavailability of mother (18.75%) and financial difficulties (12.5%). This is consistent with similar study carried out by Mukthar et al.¹² Diarrhoea disease is a highly prevalent condition among young children and is readily prevented parents of children lingering in poverty until the economic barrier to its use are

removed, hence he said that one of the economic barriers is poverty.

In the present study, mortality was documented for respondents that refrained from employing Oral Rehydration Therapy (ORT) as well as the respondents who used the therapy for their wards. Although there is no significant difference between the knowledge of ORT compared with its use, this current study reveals that the outcome and consequences of mothers who used ORT and those who did not use the therapy for their children, experienced similar morbidity and mortality outcomes.

Despite the pivotal role of ORT in diarrheal management, adherence to established protocols has emerged as a significant challenge. The early mitigation of fatalities can be achieved through the judicious implementation of appropriate ORT measures. The oral administration of solutions comprising glucose, alongside electrolytes such as sodium and potassium, underscores its therapeutic mechanism. The National Oral Rehydration Therapy (ORT) initiative was conceptualized to propagate its utilization among both maternal caregivers and healthcare practitioners. The principal aim revolves around preemptively countering dehydration by initiating ORT at the inception of diarrheal episodes, thereby advocating for its preference over intravenous alternatives for hospitalized pediatric cases afflicted by dehydration. Moreover, hindrances to the initial and sustained adoption of ORT may arise from issues like recalcitrant packaging and solubility challenges encountered with the product's constituents.

It is prudent to explore innovative packaging solutions that facilitate easy manual access, alongside establishing standardized specifications for the rapid dissolution of the ORT powder. An additional impediment resides in the limited literacy levels among maternal caregivers, constraining their adept utilization of Oral Rehydration Solution to avert dehydration stemming from diarrheal episodes. Consequently, further research is warranted to address these multifaceted barriers comprehensively and enhance the efficacy of ORT interventions.

Recommendations: Based on the findings of the study, the researcher made the following recommendations:

1. Intensive ORT training should be organized for mothers who visit hospitals for treatment as well as community mothers. This will ensure they get adequate knowledge about the therapy and proper use of it.
2. ORS should be primarily encouraged to be appropriately used for oral rehydration while appropriate home available fluids might be used as supplement or only when ORS is not available. The importance of hygiene should be emphasized in diarrheal treatment. This will reduce incidence of death at home as it will serve as first aid treatment before the child is taken to the hospital. It will also reduce the morbidity of the children both at home and when the child arrives at the hospital.
3. Exclusive breastfeeding for about the first 6 months, with continued breastfeeding along with introducing appropriate complementary foods for up to 2 years of age or longer should be encouraged among mothers. This help strengthen the immunity of the children.
4. Immunization: Childhood immunization program should also be more intense as it helps build up immunity of children from infancy.

The strength of this study is that the questionnaire is both interviewer and self-administered and the sample size used was greater than the calculated. This infers reduced error in the study. Limitation of this study is that it is a hospital-based study where mothers might have been given health education regarding diarrhoea so their level of knowledge would be different from mothers in the community. Hence, another study is needed to see the level of awareness in the community and to make comparison. Also, the study was limited to a duration of 2 weeks.

Conclusion

In conclusion, the use of oral rehydration therapy is a proven intervention to prevent morbidity and mortality among children under 5 years in the management of diarrhea, if appropriate knowledge of its use is high. Appropriate knowledge of the therapy will positively influence its use which will drastically prevent morbidity associated with diarrhoea as well as contain the incidence of mortality. There is lack of adequate

knowledge and appropriate use of ORT among mother despite that some of them have heard about it.

Declarations

Ethical consideration: The researcher presented an informed consent form to the hospital management, precisely the Human Resource Department; to obtain permission in order to carry out the study. Same was signed by a staff in the mentioned department, on the 27th of May, 2023 and this served as ethical approval and permission to carry out the study

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