

Oral Rehydration Therapy: Mothers Knowledge And Attitude

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ABSTRACT

Over the last several decades, there has been some decline in mortality rate in association with diarrhea and this has been attributed to the use of oral rehydration solutions (ORS), better supplemental feeding, improvement in hygiene and sanitation and mother education; however, the use of ORS is greatly affected by mothers knowledge and attitude toward using it in treating their children with diarrheal disease. This study was aimed to figuring out maternal knowledge, attitude and practice with respect to ORT use in diarrheal illness and the main maternal characteristics that can predict such attitude and practice. The current study was designed to be a cross sectional study enrolling 400 mothers of children aged between 2-59 m. with history of diarrheal disease. Those mothers were asked to fill a questionnaire form regarding residency, level of education, parity, occupation, did they use ORS for their children or not during diarrheal disease. Mothers who did not use the ORS were asked about the reasons for such behavior. Mothers who used the ORS were asked about their source of knowledge about ORS, the way of preparation of ORS, the type of ORS, the frequency of administration, the method of administration and their beliefs regarding the benefit of ORS. The results of current study revealed that out of 400 mothers including in this study 232 (58%) used ORS to treat their children during diarrheal disease. There was no significant association between use of ORS and residence, level of education, parity and occupation ($P > 0.05$). Mothers who used ORS had good knowledge about the advantages and the way of preparation and use of ORS and their main source of knowledge was primary health care centers. Mothers who did not use ORS admitted to have no idea about its advantages because no one has told them about these advantages. a significant proportion of mothers in our community lack necessary knowledge about the advantages of ORS in treating diarrheal disease in children and that there is urgent need to adopt health campaign to raise the awareness of women in our society regarding this common health issue.

Key words: mothers , knowledge, attitude , oral rehydration solution

1. INTRODUCTION

Diarrheal issue in pediatric patients represent a huge extent (9%) of youth mortality rate, making it the second most reason for childhood mortality around the world. Practically 1.731 billion case of diarrhea happened in 2010 in children less than 5 yr of age in developing nations, with over 80% of the cases happening in Africa and South Asia (50.5% and 32.5%, individually) and 36 million of the all out episodes progress to serious cases. Worldwide mortality might be decreasing quickly, however the general frequency of the runs has just

declined from 3.4 to roughly 2.9 case per kid year in the previous 2 decades, and it is evaluated to represent 23 million youth inability balanced life years [1]. Acute gastroenteritis refers to a clinical syndrome of diarrhea (>3 stool episodes in 24 hours) with or without vomiting that generally lasts for several days. In general, diarrhea is caused by a variety of infectious or inflammatory “processes in the intestine that directly affect enterocyte secretory and absorptive functions.”[2]

It can be infectious or malabsorptive with an osmotic or secretory mechanism.

a. Osmotic diarrhea: Water is drawn into intestinal lumen by maldigested nutrients (e.g., celiac or pancreatic disease, lactose) or other osmotic compounds. Stool volume depends on diet and decreases with fasting (stool osmolar gap ≥ 100 mOsm/kg).

b. Secretory diarrhea: Water accompanies secreted or unabsorbed electrolytes into the intestinal lumen (e.g., excessive secretion of chloride ions caused by cholera toxin). Stool volume is increased and does not vary with diet (stool osmolar gap < 50 mOsm/kg).[3]. Because children have greater insensible water loss and limited renal compensation compared with adults, they are at greater risk for fluid depletion and dehydration during an episode of diarrhea. As such they should be assessed for sign of dehydration and hypovolemia on clinical examination and have therapy directed at fluid and electrolytes replacement. In patients with severe diarrhea oral rehydration therapy (ORT) is recommended by the American academy of pediatrics and world health organization (WHO) as the preferred treatment for fluid and electrolytes losses in children with mild to moderate dehydration. Commercial ORT solutions are recommended. Fruit juices, sport drinks and soda are contraindicated and may aggravate fluid losses in the acute phase due to their higher osmolar concentration. Following rehydration, children should be offered unrestricted age-appropriate diet together with additional oral fluids to replace ongoing stool losses [4]. Prior to oral rehydration treatment (ORT) was created, intravenous liquid treatment was the backbone of liquid treatment for diarrheal.

The subsequent early studies, framed the logical reason for the revelation of ORT: a gathering of physiologists saw that glucose improves the absorption of sodium and water over the intestinal brush-layer of lab animals and that no morphological changes happen in the gut epithelium of cholera patients. Commander Phillips of the US Army in 1964 first effectively gave oral glucose saline for two cholera patients. Following this, researchers working at the Cholera Research Laboratory, Dhaka, and the Infectious Diseases Hospital, Calcutta, added to the improvement of current oral rehydration salt (ORS) suspension [5]. Within 1960, American scientist Dr. Robert K. Crane revealed that the sodium-glucose co-transport system when he observed that the body's absorption of sodium was dependent on glucose. When glucose is extant in the small part of bowel, sodium is absorbed faster, which pulls more water into the bloodstream. The correct proportion of glucose and sodium in suspension makes the rate at which water is consumed by the body is more faster. Crane's disclosure was put to use in 1968 by study group in Bangladesh guided by David Nalin. Nalin's gathering designed a simple form of ORS, blending electrolytes, sugars and water that demonstrated compelling in treating cholera-prompted dehydration. The little field test found that an "oral suspension containing glucose and electrolytes diminished the intravenous fluid requirements for about 80% of grown-up patients infected with cholera [6]. ORS was placed into wide application, during the 1971 Bangladeshi immigrant emergency. A huge number of immigrant people were found to have extreme drying out due to cholera infection. Tragically, the specialists at the camp were undersupplied with field IVs, and they went to ORS. During that period, the death rate at the camp was 30%; when ORS was taken, the death rate was sharply decreased to only 3% [7]. Over 25 years, WHO and UNICEF have prescribed one formulation of glucose-based oral rehydration fluid to treat dehydration due to diarrhea

regardless of the reason or age group influenced. This item, which gives as a suspension containing 90 mEq/l of sodium with an absolute osmolarity of 311 mOsm/l, has demonstrated powerful response and without evident side effects. It has contributed considerably to the worldwide decrease in mortality rate due to diarrhoeal during such period.

For as long as 20 years, various researches have been conducted to build up an "improved" ORS. The objective was an item that would be as safe as, and have powerful effect like ORS for avoiding or treating dehydration due to diarrhea regardless the cause, moreover, would diminish stool yield or have other significant clinical advantages. One methodology has comprised in lessening the osmolarity of ORS solution to prevent conceivable impacts of hypertonicity on net liquid absorption. This was made by lessening the glucose and salt (NaCl) gradient in the solutions. researches to assess this methodology were looked into at a advice-giving scientific meeting held in New York (USA) in July 2001, and their approval result were made to WHO and UNICEF on the usefulness and safety of decreasing osmolarity ORS in kids with intense non-cholera looseness of the bowels, and in adults and pediatric patients infected with cholera. These examinations indicated that the effectiveness of ORS suspension for treatment of kids with intense non-cholera looseness of the bowels is improved by decreasing its sodium concentrations to 75 mEq/l, its glucose to 75 mmol/l, and its all out osmolarity to 245 mOsm/l. The requirement for unscheduled IV treatment in pediatric patients given this suspension was decreased by 33%. In a consolidated investigation of this research and other studies with other lessened osmolarity ORS suspension (osmolarity 210-268 mOsm/l, sodium 50-75 mEq/l) stool yield was likewise decreased by about 20% and the rate of vomiting by about 30%. The 245 mOsm/l solutions seem to be safe, and to be with powerful response like a standard ORS for use in kids with cholera[8].

Table 1. Composition of standard and reduced osmolarity ORS solutions.[9]

Composition	Standard ORS Solution	Reduced osmolarity ORS solution
	mEq or mmol/l)	mEq or mmol/l)
Glucoses	111	75
Sodium	90	75
Chloride	80	65
Potassium	20	20
Citrate	10	10
Osmolarity	311	245

Aims of study

- 1-To estimate the rate of usage of ORS among mothers of children with diarrheal diseases.
- 2- To determine the factors that affect the use of ORS.
- 3-To assess the ability of preparing and using ORS among mothers.

2. MATERIAL AND METHOD

Study design: The current study was designed to be a descriptive cross sectional study enrolling 400 mothers of children aged between 2-59 m. with history of diarrheal disease. The study performed in Alhindiya city /Karbala governorate. The study conducted in the outpatient pediatric department in Alhindiya general hospital and 2 primary health centers from 3rd of February 2019 to the 27th of April 2019.

Those mothers were asked to fill a questionnaire form regarding residency, level of education, parity, occupation, and did they use ORS for their children or not during diarrheal disease. Mothers who did not use the ORS were asked the reasons for such behavior. Mothers who used the ORS were asked about their source of knowledge about ORS, the way of preparation of ORS, the type of ORS used, the frequency of administration, the method of administration and their beliefs regarding the benefit of ORS.

The questionnaire done privately with each mother

Permission had been taken from the mothers involved in this study and from the administrations of the hospital and the primary health centers.

Statistical analysis: Data were transformed into an SPSS version 23 spread sheet and were presented as number and percentage. Chi-square test was used to study association between categorical variables. The level of significance was set at $P \leq 0.05$.

3. STUDY QUESTIONNAIRE

Residency Rural. Urban

Education. Illiterate Primary&secondary school
Higher education

Parity 1 . 2 . 3 & more

Occupation: Housewife . Student . Employee

Mothers using ORS **Mothers not using ORS**

Because:

Source of knowledge.
.private clinic . The Child refuse it
Primary health center . The child vomit it
Hospital . Don't believe in ORS
Social media . as a treatment.
Others

Prescribed ORS: Ready to use ORS . ORS powder

Preparation of ORS: (how much water to use, how would you measure it, type of water used, how much of the packet you use, how long you can use mixed ORS ?), Correct .

Relatively incorrect

Incorrect

Administration of ORS: Cup&spoon. Bottle

How often she use ORS :

Once a day . 2 -3 times After each motion or vomiting

How ORS is useful: Feed the child

stop the diarrhea . Treat Dehydration . Don't know

4. RESULTS

In the current study we found that only 58% of mothers used ORS for their children during diarrheal disease. The use of ORS in association with maternal characteristics is shown in table 2. There was no significant association between use of ORS and residence, urban versus rural ($P = 0.601$). There was also insignificant association between ORS use and education level ($P = 0.141$). Besides, there was no significant association between parity and use of ORS ($P = 0.066$); however, mothers who did not use ORS were more likely to have a single

child in comparison with mothers who used ORS. Moreover, there was no significant association between the use of ORS and mothers' occupation, as shown in table 2.

Table 2: Association between use of ORS and maternal characteristics

Characteristics	Mothers used ORS <i>n</i> = 232		Mothers did not use ORS <i>n</i> = 168		<i>P</i> ¥
	<i>n</i>	%	<i>n</i>	%	
Residency					
Urban	118	50.9	81	48.2	0.601 NS
Rural	114	49.1	87	51.8	
Education					
Illiterate	49	21.1	23	13.7	0.141 NS
Primary and secondary	158	68.1	128	76.2	
Higher education	25	10.8	17	10.1	
Parity					
One	19	8.2	24	14.3	0.066 NS
2	56	24.1	47	28.0	
≥ 3	157	67.7	97	57.7	
Occupation					
Housewife	214	92.2	154	91.7	0.834 NS
Student	2	0.9	7	4.2	
Employee	16	6.9	7	4.2	

n: number of mothers; ORS: oral rehydration solution; ¥: Chi-square test; NS: not significant at *P* > 0.05

The sources of information about ORS concerning mothers who used it are demonstrated in table 3.. The most frequent source of knowledge was primary health care center accounting for 131 (56.5 %), followed by private clinic 87 (37.5 %), then hospital 62 (26.2 %), other minor sources 4 (1.7 %) and lastly social media 3 (1.3 %), as shown in table 3.

Table 3: Source of information about ORS concerning mothers who used it

Source of information	<i>n</i>	%
Primary health care center	131	56.5
Private clinic	87	37.5
Hospital	62	26.7
Other	4	1.7
Social media	3	1.3

Note: some mothers had more than one source of information.

The beliefs of mothers about the role of ORS are shown in table 4. Most of mothers had an idea that ORS will treat dehydration and their proportion was (55.2 %) (128 mothers). Mothers who believe that ORS stops diarrhea represented (37.1 %) (86 mothers). Mothers who anticipated that ORS provides feeding for children accounted for (14.2 %) (33 mothers)

and mothers who have no idea about ORS advantages accounted for (4.3 %) (10 mothers), as shown in table 4.

Table 4.: Beliefs of mothers about the role of ORS .

Belief	<i>n</i>	%
Treat dehydration	128	55.2
Stop diarrhea	86	37.1
Feed child	33	14.2
Don't know	10	4.3

Note: some mothers had more than one belief.

The type of ORS used by mothers was mainly of WHO formula and minor fraction of mothers used ready to use formula, 211 mothers (90.9 %) versus 21 mothers (9.1 %). Correct method of preparation was seen in 80 mothers (34.5 %), relatively correct method of preparation was seen in 123 mothers (53.0 %) and incorrect preparation method was seen in 29 mothers (12.5 %). According to frequency of ORS administration, mothers were classified into 10 mothers (4.3 %), 104 mothers (44.8 %) and 118 mothers (50.9 %) as once /day, 2-3 times /day and after each loose bowel, respectively. Method of ORS administration was either cup and spoon or bottle, 184 mothers (79.3 %) and 48 mothers (20.7 %), respectively, as shown in table 5..

Table 5: Type and knowledge of mothers about ORS.

Characteristic	<i>n</i>	%
Type of ORS		
Ready to use	23	9.1
WHO formula	211	90.9
Preparation of ORS		
Correct	80	34.5
Relatively correct	123	53.0
Incorrect	29	12.5
Frequency		
once/day	10	4.3
2-3 times /day	104	44.8
After each loose stool	118	50.9
Method of ORS administration		
Cup and spoon	184	79.3
Bottle	48	20.7

Table 6.demonstrated the reason why mothers in the second group did not use ORS for treatment of dehydration. The most prevalent reason was “No one advice her” accounting for 140 (83.3 %) followed by “The child refuse it” accounting for 22 (13.1 %) and lastly “She did not believe in ORS benefit” seen in 6 (3.6 %).

Table 6. Reasons for not using ORS

Reason	<i>n</i>	%
No one advice her	140	83.3
The child refuse it	22	13.1
She did not believe in ORS benefit	6	3.6

5. DISCUSSION

In the current cross sectional study we failed to link the use of ORS to any of the characteristics of mothers including residency, level of education, parity and occupation, this is on the contrary of Al-karch study which show significant correlation between mother’s knowledge and level of education of mothers [10].This can be partly explained by the fact that most mothers in our study are of low education since the studied population is largely rural.

In the present study, the main source of knowledge about ORS comes from primary health care centers reflecting very well strategy adopted by these centers toward raising mothers’ knowledge about advantages of ORS; in addition, significant number of mothers has gained information about the advantages of ORS from private clinics. The good level of knowledge seen in mothers practicing ORS is in line with the observations made by several other studies [11-14].

Correct and relatively correct method of preparation was seen in a substantially good proportion of mothers using ORS. Frequent administration of ORS was seen in a good proportion of mothers. The relatively good knowledge expressed by mothers practicing ORS in the current study is consistent with the observation made by several other authors [15-17].

In the current study, it is worth to mention that significant proportion of mothers did not use the ORS and they accounted for 42% (168 mothers), that is, more than one third of participating mothers.

Ajuwon et al.[18]reported the ORS utilization rate of 49.5%, whereas Osonwa et al.[19] reported a rate of 43.5%.

The main reason for not using the ORS was lack of knowledge about its beneficial effect. This had also been observed in Osonwa te al study[19],therefore, we believe that more efforts are needed at all levels of health administration to raise the awareness of mothers about the advantages and the correct use of ORS in the treatment of diarrheal disease in children.

6. CONCLUSION AND RECOMMENDATIONS

a significant proportion of mothers in our community lack necessary knowledge about the advantages of ORS in treating diarrheal disease in children and more efforts are needed to adopt health campaign to raise the awareness of mothers in our society regarding this common health issue.

REFERENCES

- [1]. Zulfiqar Ahmed Bhutta. Acute Gastroenteritis in Children Nelson Textbook of Pediatrics. 20th ed. Philadelphia, PA: Saunders Elsevier;2016: chap.340.(1854-1874).
- [2]. Marcdante, Karen, Kliegman, Robert M.
- [3]. Acute Gastroenteritis, Etiology and Epidemiology. Nelson Essentials of Pediatrics. 8th ed. E-book 2016. chap 112. (4004-4038).
- [4]. 3-Nina Guo, and Ammarah Iqbal, Gastroenterology. Helen K. Hughes and Lauren K. Khal, The Harriet Lane Handbook. 21st Ed.
- [5]. Brenadin M. Boyle and Ivor D. Hill. Diarrhea. Mark W. Kline, Susan M. Blainy et al. Rudolph's Pediatrics. 23rd Ed. 2018. chap 380 (5410-5417).
- [6]. Bansal RD, Kanan AT, Mehara M. ORT-an adjunct for diarrheal diseases control. Indian journal of public health. 1994 Apr-Jun;38(2):39-43.
- [7]. 6-Nalin, D., Cash, R., Islam, R., Molla, M., & Phillips, R. (1968). Oral maintenance therapy for cholera in adults. The Lancet, 292(7564), 370-372.
- [8]. 7-Andrea Gerlin,. Diarrhea A Simple Solution. TIME Europe, 168(17), 2014. pp. 40-47.
- [9]. 8-Essential Medicines and Health Products Information Portal. A World Health Organization resource. web. page.
- [10]. 9- New formulation of Oral Rehydration Salts (ORS) with reduced osmolarity. Technical Bulletin No.9. unicef.org.
- [11]. 10- Wasan J. Mohammed, Reem J Hassan, Rasha A. Kadhm et al. Assessment of Mothers' Knowledge, Attitude and Practice in Use of Oral Rehydration Solution For Diarrhea in a Sample of the Primary Health Care Centers of Al-Karkh Health Directorate.
- [12]. 11- Desta BK, Assimamaw NT, Ashenafi TD. Knowledge, practice, and associated factors of home-based Management of Diarrhea among caregivers of children attending under-five Clinic in Fagita Lekoma District, Awi zone, Amhara regional state, Northwest Ethiopia, 2016. Nurs Res Pract. 2017;2017:8084548.
- [13]. 12- Merga N, Alemayehu T. Knowledge, perception, and management skills of mothers with under-five children about diarrhoeal disease in indigenous and resettlement communities in Assosa District, Western Ethiopia. J Health Popul Nutr. 2015;33(1):20–30.
- [14]. 13- Amare D, Dereje B, Kassie B, Tessema M, Mullu G, et al. Maternal Knowledge and Practice Towards Diarrhoea Management in Under Five Children in Fenote Selam

- Town, West Gojjam Zone, Amhara Regional State, Northwest Ethiopia, 2014. *J Infect Dis Ther.* 2014;2:182.
- [15]. 14- Ghasemi AA, Talebian A, Masoudi Alavi N, Moosavi G. Knowledge of mothers in management of diarrhea in under-five children, in Kashan, Iran. *Nurs Midwifery Stud.* 2013;1(3):158–162.
- [16]. 15- Mumtaz Y, Zafar M, Mumtaz Z. Knowledge attitude and practices of mothers about diarrhea in children under 5 years. *J Dow Uni Health Sci.* 2014;8(1):3-6.
- [17]. 16- Saurabh S, Shidam UG, Sinnakirouchenan M, Subair M, Hou LG, Roy G. Knowledge and practice regarding oral rehydration therapy for acute diarrhoea among mothers of under-five children in an urban area of Puducherry India. *Natl J Community Med.* 2014;5(1):100–104.
- [18]. 17- Ansari M, Ibrahim MI, Hassali MA, Shankar PR, Koirala A, Thapa NJ. Mothers' beliefs and barriers about childhood diarrhea and its management in Morang district, Nepal. *BMC Res Notes.* 2012;5:576.
- [19]. 18-Ajuwon AJ, Agbolade MO, Dipeolu IO. Knowledge and use of oral rehydration therapy among mothers of under-five children in Ibadan, Nigeria. *Afr J Biomed Res* 2015;18:237-48.
- [20]. 19-Osonwa KO, Eko JE, Ema S. Utilization of oral rehydration therapy in the management of diarrhea in children among nursing mothers in Crossriver State, Nigeria. *Am J Public Health Res* 2016;4:28-37.