

## Awareness among mothers regarding oral rehydration salt solution in management of diarrhea: A cross-sectional study

P S Thammanna, M Sandeep, P V Sridhar

From Department of Pediatrics, Mandya Institute of Medical Sciences, Mandya, Karnataka, India

**Correspondence to:** Dr. P S Thammanna, Department of Pediatrics, Mandya Institute of Medical Sciences, Mandya - 571 401, Karnataka, India. Phone: +91-9449627788. E-mail: drthammannaps@gmail.com

Received – 24 November 2015

Initial Review – 09 December 2015

Published Online – 31 December 2015

### Abstract

**Background:** Diarrhea remains one of the leading global causes of death among children under the age of 5 years; diarrhea and the resultant mortality from it is both preventable and treatable. Proper knowledge regarding the use of oral rehydration salt solution (ORS) helps in preventing morbidity and mortality from diarrhea. **Objective:** To assess the awareness, knowledge and practice of mothers of under-five children regarding the use of ORS and other alternative solution during diarrheal illness. **Methods:** A cross-sectional study involving 250 mothers with children of age 6 months - 5 years was carried out. Data were collected using a semi-structured questionnaire; it included data regarding socio-demographic characteristics and questions pertaining to knowledge of mothers about ORS. **Results:** Out of 250 study participants, 203 (81.2%) mothers were homemakers and 212 (84.8%) were literate. It was seen that 63 (25.2%) mothers did not know about ORS, 146 (58.4%) knew about the role of ORS in diarrhea, 129 (51.6%) had knowledge regarding homemade ORS. Only 119 (47.6%) mothers knew how to prepare ORS properly, and the most common source of information regarding ORS was a doctor. 84 (33.6%) mothers had a misconception about ORS, and only 51 (20.4%) participants knew about syrup zinc. The higher education level of mother was associated with better knowledge regarding various aspects of oral rehydration therapy. **Conclusion:** The knowledge regarding the use of ORS in diarrhea is insufficient; hence, there is need to educate mothers regarding the use of ORS as well as homemade ORS substitutes during diarrhea.

**Key words:** Diarrhea, Knowledge, Oral rehydration salt

Preventable causes like infectious diseases (pneumonia, diarrhea, and malaria), malnutrition and neonatal complications are still the leading cause for under-five child mortality worldwide [1]. In 2013, an estimated 6.3 million live-born children worldwide died before the age of 5 years, and approximately, 9.2% of these deaths were due to diarrheal diseases [2,3]. In India, around 1.5 million children under-5 years of age died in the year 2012 [4]. The diarrheal disease was responsible for 13% of the above deaths, resulting in loss of around 300,000 lives every year in India [5]. According to National Family Health Survey-3 report, 9% of all under-five children were reported to be suffering from diarrhea in previous 2 weeks [6]. Young age, low socio-economic status (SES), poor maternal literacy, the presence of under-five sibling in the family, low birth weight, inadequate breastfeeding, malnutrition, poor sanitation and poor hygiene practices of the mother are associated with a higher incidence of diarrheal diseases in young children [7,8]. Most of the deaths due to diarrhea are attributable to fluid loss and resultant severe dehydration.

Current guidelines for management of diarrhea include low osmolarity oral rehydration salt solution (ORS), zinc and continued feeding of energy dense feeds in addition to

breastfeeding. Oral rehydration therapy (ORT) with ORS remains the cornerstone of appropriate case management of diarrheal dehydration and is considered the single most effective strategy to prevent diarrheal deaths in children [9]. Since the introduction of ORT in 1979, there has been a steady decline in deaths due to diarrheal diseases [10]. However, ORT has not yet achieved its full potential of preventing diarrheal deaths. Low SES, low literacy of mothers and lack of knowledge among mothers are main factors responsible for this. It is commonly observed that most of the mothers neither can mix commercially available ORS properly nor are able to realize the significance of giving more fluids during acute diarrhea to their children [11]. Similarly, despite its free distributed under the National Rural Health Mission (NRHM), there is very low usage of syrup zinc [12].

Several studies done to assess knowledge regarding use of ORS in diarrhea have reported that maternal literacy had a significant influence on the practice of use of ORS in diarrhea [13-15]. The objective of this study was to assess the awareness, knowledge and practice of mothers of under-five children regarding the use of ORS and other alternative solutions during diarrheal illness.

## METHODS

The present study was a cross-sectional descriptive study carried out to assess the awareness and knowledge regarding the role of ORS in the management of diarrhea among mothers who attend the Outpatient Department, Department of Pediatrics, Mandya Institute of Medical Sciences, Karnataka, India. The study was conducted over a period of 1-month (October 2015) after obtaining approval from Institutional Ethics Committee. Mothers, who had children of 6 months to 5 years age, and willing to give relevant information, were enrolled in the study by convenience sampling. Mothers, whose children were below 6 months of age or above 5 years of age, were excluded from the study.

Data were collected using a semi-structured questionnaire. Informed written consent was obtained before interviewing each participant. Practice and knowledge of mother regarding ORS were defined as awareness about the availability of ORS and its use in the management of diarrheal disease. The questionnaire included data regarding socio-demographic characteristics like age, educational status and occupation of mother, type of house, availability of sanitary facility in home and safe drinking water facility. SES classification of the family was done based on modified Kuppaswamy's classification [16]. Questions related to knowledge about ORS, methods of preparation, quantity of ORS to be given, place of availability and source of information about ORS and also about the role of ORS in the management of diarrhea were included in the questionnaire.

Data collected were entered in MS Excel spreadsheet. Descriptive statistics was applied, demographic data and level of knowledge regarding ORS was described in terms of frequency and percentage, Chi-square test was used to analyze categorical data. Tables and graphs were generated using MS Word and MS Excel. A  $p < 0.05$  was considered statistically significant.

## RESULTS

Total of 250 mothers were interviewed, and socio-demographic profile of study subjects is depicted in Table 1. Of these, 203 (81.2%) mothers were homemakers and only 47 (18.8%) were working mothers. Most of them were literates ( $n=212$ , 84.8%), and more than half of the mothers ( $n=139$ , 55.6%) were of age 19-25 years. The majority of the mothers belonged to the upper lower class of SES ( $n=128$ , 51.2%) followed by lower middle class ( $n=81$ , 32.4%). There were 95 (38%) children in the age group of 25-36 months, followed by 88 (35.2%) children in the age group 37-60 months. 136 mothers were from a rural area (54.4%) and 114 were from urban area (45.6%). Safe drinking water facility was not available in 63 household (25.2%) while sanitary toilet facility was not available in 32 household (12.8%).

**Table 1: Socio-demographic profile of study subjects (n=250)**

Characteristics	Frequency (n)	Percentage
Mother's age (years)		
19-25	139	55.6
26-30	92	36.8
>30	19	7.6
Mother's occupation		
House wife	203	81.2
Working	47	18.8
Mother's education		
Illiterate	38	15.2
Primary	23	9.2
Middle	45	18
High school and above	144	57.6
Child's age (months)		
6-12	21	8.4
13-24	46	18.4
25-36	95	38
37-60	88	35.2
SES		
Upper	0	0
Upper middle	2	0.8
Lower middle	81	32.4
Upper lower	128	51.2
Lower	39	15.6

### SES: Socio-economic status

At the time of interview, 57 children were suffering from diarrhea (22.8%), while past history of diarrhea was present in 78 children (31.2%). Among the study participants, majority knew that ORS is available which can be used in diarrhea ( $n=187$ , 74.8%). The main source of information about ORS was doctors (44.38%), followed by anganwadi worker/ASHA worker (25.67%), TV/radio (13.37%) and rest by neighbours or, pharmacy. According to them, commonplace of availability of ORS packet is hospital ( $n=118$ ) followed by the pharmacy ( $n=53$ ), anganwadi worker ( $n=42$ ).

Responses of the study participants to the questionnaire are summarized in Table 2. It was observed that the knowledge regarding ORS was more in literate mothers as compared to illiterate mothers. 146 (58.4%) of the study participants were able to explain the role of ORS in diarrhea. Responses on the role of ORS were that it "decreases water loss in diarrhea," "reduces diarrheal frequency" and "replenishes water and electrolyte losses." Of the total participants, 129 (51.6%) had knowledge regarding homemade ORS; commonly used homemade ORS by participants were kanji, sugar and salt solution, buttermilk with salt and daal ka pani. 119 (47.6%) participants knew how to prepare ORS properly and were able to demonstrate the method of preparing ORS. 138 (55.2%) participants knew about the quantity of ORS to be given during

**Table 2: Knowledge of mothers about ORS in relation to their education status**

Parameter	Educational status of mother (%)				Total n=250 (%)	$\chi^2$ value (p value)
	Illiterate	Primary	Middle	Above		
Role of ORS in diarrhea	12 (31.57)	13 (56.52)	27 (60)	94 (65.27)	146 (58.4)	14.13 (0.0027)
Homemade ORS	9 (23.68)	11 (47.82)	24 (53.33)	85 (59.02)	129 (51.6)	15.22 (0.0016)
Preparation of ORS	7 (18.42)	9 (39.13)	21 (46.66)	82 (56.94)	119 (47.6)	18.68 (0.0003)
Quantity of ORS	11 (28.94)	12 (52.17)	25 (55.55)	90 (62.5)	138 (55.2)	13.78 (0.0032)
Harm of giving too much of ORS	4 (10.52)	7 (30.43)	20 (44.44)	73 (50.69)	104 (41.6)	21.33 (0.00009)
Danger of keeping ORS for longtime	6 (15.78)	10 (43.47)	21 (46.66)	70 (48.61)	107 (42.8)	13.58 (0.0035)
Stop ORS if diarrhea continues	12 (31.57)	8 (34.78)	13 (28.88)	39 (27.08)	72 (28.8)	0.75 (0.86)
Stop ORS if vomiting continues	20 (52.63)	11 (47.82)	18 (40)	54 (37.5)	103 (41.2)	3.30 (0.34)
Misconceptions in using ORS	17 (44.73)	10 (43.47)	16 (35.55)	41 (28.47)	84 (33.6)	4.89 (0.17)
Use of syrup zinc in diarrhea	2 (5.26)	5 (21.73)	9 (20)	35 (24.30)	51 (20.4)	6.74 (0.08)

**ORS: Oral rehydration salt**

diarrhea, 104 (41.6%) knew about the harm of giving excess ORS, and 107 (42.8%) knew that it is dangerous to keep ORS for more than 24 h. 72 (28.8%) mothers responded that ORS should be stopped if diarrhea continues, and 103 (41.2%) were of the opinion that ORS should be stopped if vomiting continued.

It was observed that 84 (33.6%) mothers had misconception about ORS, and this was more in illiterate mothers; however, the difference was not found to be statistically significant. Common misconceptions observed among the mothers were that child is small, ORS has a bad taste, oral intake during diarrhea should be decreases and breastfeeding should be restricted. Knowledge regarding syrup zinc was noted in only 51 participants (20.4%).

**DISCUSSION**

Diarrhea remains one of the leading global causes of death among children under the age of 5 years. ORS is simple, highly effective, inexpensive and appropriate therapy for diarrheal dehydration and since the introduction of ORT in 1979, there has been a steady decline in deaths due to diarrheal diseases [10]. The present study had 250 mothers as participants, of which more than half were of the age group 19-25 years. Only 47 mothers were employed; however, most of them were literate (n=212). Since our hospital is a government hospital catering to patients belonging to lower economic strata, we had a higher number of study subjects belonging to upper lower class of SES.

In our study 187 (74.8%) of participants had idea that ORS can be used in treating diarrhea. Similar reports have been shown in a study conducted by previous studies [13-15,17]. Knowledge about the role of ORS and the correct methods of preparing ORS was found to be more in literate mothers as compared to illiterate (p=0.0027 and 0.0016 respectively). In a study done by Sultana et al. [13], it was found that 60% of the mothers had adequate knowledge regarding ORS and literacy rate of mother was seen to be associated with adequate

knowledge about ORS (p<0.001). Study conducted by Rasanias et al. [14] have reported that 69.8% of the participants knew regarding the role of ORS in diarrhea and only 38.7% knew how to prepare ORS properly. Dhadave et al. [15] have reported that 65.7% of the participants knew about ORS, and the awareness was more in literates as compared to illiterates.

Nearly half of the respondents came to know about ORS on contact with doctors (44.38%), which is similar to the findings seen in other studies [13,14]. However, Dhadave et al. [15], observed that doctors were the source of information to nearly 90% of respondents in their study. 129 (51.6%) mothers in our study had knowledge regarding homemade ORS, which is similar to observations of Dhadave et al. [15]. However, Singh et al. [17] have reported a higher knowledge (73.72%) regarding homemade ORS in their study.

In this study, 84 (33.6%) of the participants had misconception regarding ORS, and it was more in illiterate mothers as compared to that in literate mothers (p=0.17). In a study, Rasanias et al. [14], have reported that 29.3% of participants had misconceptions regarding ORS. Even though syrup zinc has been advocated in the management of diarrhea and is supplied under NRHM, the knowledge regarding it was seen only in 20.4% of the participants. This is better than the values reported by Singh et al. (only 4.33% of the participants) [17].

Our study shows that nearly 40% of mothers had incorrect knowledge as to when ORS needs to be stopped and whether it needs to be stopped if child continues to have vomiting or diarrhea. The present study shows that higher education level of mother is associated with better knowledge regarding various aspects of ORT. Poor literacy is associated with low utilization of ORS for treating diarrhea leading to the probable development of dehydration. Focused health education of mothers has been shown to improve their knowledge and practice in the use of ORS in diarrhea [18]. This reaffirms the importance of mother's education in the reduction of diarrheal

morbidity and mortality. Electronic and mass media are good tools which can be used to improve the awareness regarding ORT.

The following measures are been taken in our hospital to improve the awareness and practice of use of ORS: Visual aids have been displayed in outpatient department (OPD) depicting the uses of ORS and method to prepare ORS; focused education of mothers, who get their children with diarrhea about ORS and homemade ORS, is been done; an oral rehydration counter has been started in OPD. This study had a limitation as this was a hospital based cross-sectional study and the actual knowledge about ORS in mothers observed may be different in the general population. Second, change in the knowledge and practice of ORS use after educating mothers was not confirmed by follow-up.

## CONCLUSION

In this study, although majority of the mothers knew about ORS, the knowledge regarding preparation and use of ORS in diarrheal disease was insufficient. Hence, there is need to educate mothers regarding use of ORS as well as homemade ORS substitutes during diarrhea, Various measures to improve the knowledge of mother regarding diarrheal management with ORT in addition to re-enforcing the steps that will help in preventing diarrheal dehydration and resultant death by using mass media and health education can be the way forward.

## REFERENCES

1. United Nations Children's Fund. Committing to Child Survival: A Promise Renewed- Progress Report 2013. New York: UNICEF; 2013.
2. United Nations Children's Fund. Levels & Trends in Child Mortality. Estimates Developed by the UN Inter-Agency Group for Child Mortality Estimation. New York, USA: UNICEF; 2013.
3. Walker CL, Rudan I, Liu L, Nair H, Theodoratou E, Bhutta ZA, et al. Global burden of childhood pneumonia and diarrhoea. *Lancet*. 2013;381(9875):1405-16.
4. Bhan MK. Accelerated progress to reduce under-5 mortality in India. *Lancet Glob Health*. 2013;1(4):e172-3.
5. Million Death Study Collaborators, Bassani DG, Kumar R, Awasthi S, Morris SK, Paul VK, et al. Causes of neonatal and child mortality in India: A nationally representative mortality survey. *Lancet*. 2010;376(9755):1853-60.
6. International Institute for Population Sciences (IIPS) and Macro International. National Family Health Survey 3 (NFHS-3),

2005-06: India. Mumbai: IIPS; 2008.

7. Gupta P, Murali MV, Seth A. Epidemiology of diarrhea in urban slums. *Indian Pediatr*. 1998;35:147-51.
8. Singh J, Gowriswari D, Chavan BR, Patiat RA, Debnath AC, Jain DC, et al. Diarrhoeal diseases amongst children under five. A study in rural Alwar. *J Commun Dis*. 1992;24(3):150-5.
9. Bhatnagar S, Lodha R, Choudhury P, Sachdev HP, Shah N, Narayan S, et al. IAP Guidelines 2006 on management of acute diarrhea. *Indian Pediatr*. 2007;44:380-9.
10. Victora CG, Bryce J, Fontaine O, Monasch R. Reducing deaths from diarrhoea through oral rehydration therapy. *Bull World Health Organ*. 2000;78(10):1246-55.
11. Seyal T, Hanif A. Knowledge, attitude and practices of the mothers and doctors regarding feeding, oral rehydration solution (ORS) and use of drugs in children during acute diarrhea. *Ann King Edward Med Coll*. 2009;15(1):38-41.
12. Shah D, Choudhury P, Gupta P, Mathew JL, Gera T, Gogia S, et al. Promoting appropriate management of diarrhea: A systematic review of literature for advocacy and action: UNICEF-PHFI series on newborn and child health, India. *Indian Pediatr*. 2012;49:627-49.
13. Sultana A, Riaz R, Ahmed R, Khurshid R. Knowledge and attitude of mothers regarding oral rehydration salt. *J Rawalpindi Med Coll*. 2010;14(2):109-11.
14. Rasania SK, Singh D, Pathi S, Matta S, Singh S. Knowledge and attitude of mothers about oral rehydration solution in few urban slum of Delhi. *Health Popul Perspect Issues*. 2005;28(2):100-07.
15. Dhadave MM, Kumar A, Reddy S, Vijayanath V. A study on diarrhea related practices awareness of ORS among mothers of under-five children attending OPD, CHTC, Rajpur. *J Pharm Biomed Sci*. 2012;19(19):1-3.
16. Oberoi SS. Updating income ranges for Kuppusswamy's socio-economic status scale for the year 2014. *Indian J Public Health*. 2015;59(2):156-7.
17. Singh AK, Dixit S, Gupta S, Bhatt N. Knowledge, attitude and practices of mothers regarding acute diarrhea management in the urban population of hilly region of Uttarakhand. *J Evol Med Dent Sci*. 2012;1(1):2-8.
18. Pahwa S, Kumar GT, Toteja GS. Performance of a community-based health and nutrition-education intervention in the management of diarrhoea in a slum of Delhi, India. *J Health Popul Nutr*. 2010;28:553-9.

*Funding: None; Conflict of Interest: None Stated.*

**How to cite this article:** Thammanna PS, Sandeep M, Sridhar PV. Awareness among mothers regarding oral rehydration salt solution in management of diarrhea: A cross-sectional study. *Indian J Child Health*. 2015;2(4):215-218.