

## Original Article

# KNOWLEDGE AND PRACTICE REGARDING ORAL REHYDRATION THERAPY FOR ACUTE DIARRHOEA AMONG MOTHERS OF UNDER-FIVE CHILDREN IN AN URBAN AREA OF PUDUCHERRY, INDIA

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## ABSTRACT

**Background:** Diarrhoea is a major cause of morbidity and mortality among under-five children. Correct knowledge regarding Oral Rehydration Therapy (ORT) helps prevent morbidity and mortality due to diarrhoea. Our objective was to assess the awareness, knowledge and practice of mothers of under-five children regarding ORT and home management of diarrhoea.

**Methods:** A cross-sectional study was carried out during September 2012. A structured and pre-tested questionnaire was administered to all the mothers of under-five children in the study area.

**Results:** A total of 252 children and 245 mothers were covered. Around two-thirds of mothers knew about at least one method of diarrhoea prevention. Three-fourths of mothers had heard of Oral Rehydration Solution (ORS) and knew how to prepare and administer ORS. Also, majority of mothers (82.9%) were aware about home available fluids for rehydration. Around half of the mothers who knew about ORS thought that ORS had to be discontinued if diarrhoea persisted or vomiting developed. Mothers educated only till class eight were almost twice less likely to know about ORS preparation as compared to better educated mothers (OR = 2.15, 95% CI 1.14 - 4.05,  $P = 0.02$ ). No association was found between lack of knowledge regarding home available fluids with younger age, low education of mothers or low per capita income.

**Conclusion:** Although awareness regarding ORS and home available fluids was adequate, knowledge regarding its continuation in persistent diarrhoea or vomiting was poor. Lack of education predisposed to ignorance regarding ORS preparation.

**Key words:** diarrhoea, under-five, Oral rehydration, ORS, home available fluids, knowledge

## INTRODUCTION

Diarrhoea is one of the leading causes of morbidity and mortality among under-five children. Globally, acute diarrhoea claims around 1.5 million lives of under-five children.<sup>1</sup> Moreover, in the South-East Asian region diarrhoea has been estimated to account for 31.3% of under-five mortality.<sup>2</sup> The problem of diarrhoea can be tackled at both primary and secondary prevention levels. The former comprises improvement of sanitation and water quality. The latter consists of early recognition of dehydration due to diarrhoea and prompt oral rehydration by either using ORS or appropriate home available fluids. ORS has been proven to be effective in preventing diarrhoea mortality in the

community while varying degree of evidence favours the use of home available fluids.<sup>3</sup>

Oral rehydration has not yet achieved its full potential of preventing diarrhoea deaths due to many factors. Poor socio-economic status and lack of knowledge among caregivers mean that oral rehydration is not always applied when needed.<sup>4</sup> Often the caregivers are late in recognising diarrhoea as a cause of concern.<sup>5</sup> Furthermore, diarrhoea treatment practices are not based on evidence as shown by widespread prescription of unnecessary drugs.<sup>5</sup>

The objective of our study was to assess the awareness, knowledge and practice of mothers of under-five children regarding home management of diarrhoea,

comprising of ORS, home available fluids, feeding in diarrhoea and recognition of danger signs of diarrhoea.

### MATERIALS AND METHODS

**Study setting and design:** We carried out a cross-sectional study during September 2012. We studied urban areas of Chiniyapuram and Vazhakulam in Puducherry. The study area is served by our Institute Urban Health Centre. The total population of our study area was 4049 with an under-five population of 298. The entire sampling frame was covered as a part of regular field-based operational research done by the Urban Health Centre team. The survey team consisted of interns and a postgraduate resident.

**Data Collection:** A structured and pre-tested questionnaire was administered to the mothers of under-five children through door-to-door survey. Verbal informed consent was obtained before interviewing each participant. Questions were standardised in the local language to ensure uniformity in data collection. First section of the questionnaire pertained to the demographic details and awareness regarding cause and prevention of diarrhoea followed by awareness regarding oral rehydration therapy. We also assessed the awareness of mothers regarding danger signs in diarrhoea. Only those mothers whose children had diarrhoea in the past month were evaluated for their actual practice and treatment seeking behaviour.

**Statistics :**Data was entered in Excel sheet and was double checked for errors. We calculated odds ratios using logistic regression to find out the risk factors for the lack of knowledge about preparation of ORS and lack of awareness regarding home available fluids. 95% confidence intervals were stated for Odds ratios. In all analyses, *P* values less than 0.05 were considered significant. SPSS version 20.0 was used for statistical analysis. Confidentiality of each participant was ensured throughout the data collection and analysis.

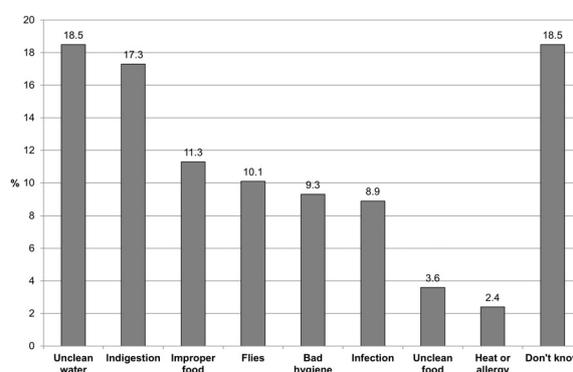
### RESULTS

We covered a total of 252 under-five children and 245 mothers in our survey. Thus the coverage of the mothers of under-five children was 93%. In the month preceding the survey, 20 (7.94%) out of the 252 children were found to have diarrhoea. Table 1 shows that around 98% of the mothers were literate and most of them belonged to the age-group of 21-30 years.

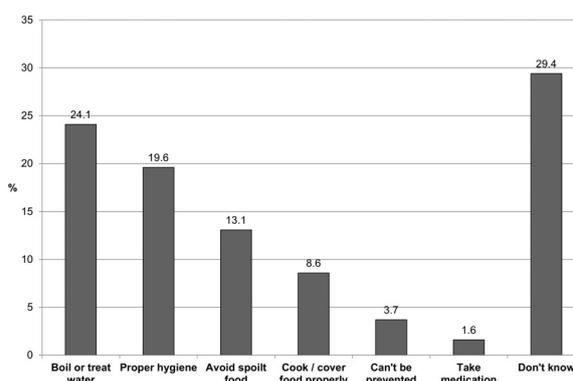
**Knowledge regarding diarrhoea:** Only 22 out of the 245 mothers (9.0%) were aware of infection or germs as a cause of diarrhoea. Majority expressed their knowledge of cause of diarrhoea in terms of mode of infection such as dirty water, spoiled or stale food, flies, general lack of hygiene and unclean food (Fig 1). The remaining 37% of the mothers either told they didn't know about the cause or answered incorrectly.

**Table 1: Baseline demographic characteristics of the 245 mothers of under-five children**

Category	Frequency (%)
<b>Age (years)</b>	
Up to 20	9 (3.7)
21-25	109 (44.5)
26-30	102 (41.6)
31 and more	25 (10.2)
<b>Per capita monthly income (Rs)</b>	
Up to 1000	98 (40.0)
1001-2000	106 (43.3)
2001 and more	41 (16.7)
<b>Education</b>	
Illiterate	4 (1.6)
Primary (1 - 5)	21 (8.6)
Middle (6 - 8)	76 (31.0)
Secondary (9 - 10)	102 (41.6)
Higher secondary (11 - 12)	36 (14.7)
Diploma and graduation	8 (3.3)



**Fig 1: Knowledge of the respondents regarding the causes of diarrhoea (n= 245)**



**Fig 2: Knowledge of the respondents regarding the methods of prevention of diarrhoea (n = 245)**

About two-thirds of mothers (64.5%) knew about at least one preventive method of diarrhoea which consisted of boiling or treating drinking water, proper hygiene, avoiding spoilt food and cooking or covering food properly (Fig 2).

**Awareness and knowledge regarding oral rehydration:** One ninety one out of the 245 mothers (78%) were aware about ORS. One eighty eight of them

(76.7%) knew how to prepare and administer ORS. One forty eight of these 191 mothers (77.5%) who were aware of ORS knew that ORS solution should be used within 24 hours of preparation. Only 10 out of the 245 mothers (4.1%) knew how to prepare the home based salt and sugar substitute for ORS.

Almost half of the 191 mothers who knew about ORS (49.7%) thought that ORS should be discontinued for the child when diarrhoea persisted or vomiting developed. 19.6% of the 245 mothers thought that feeding should be either reduced or discontinued during diarrhoea. Around 82.9% of the mothers were aware of the home available fluids for rehydration. Table 2 shows that rice-water with salt was the most common fluid being used (53%). Out of these, acceptable home fluids containing both salt and carbohydrate components were rice-water with salt, salt and sugar water, coconut water and *rasam* or *daal* water which together constituted 73.3% of the total responses.

**Table 2: Home available fluids being used by the 245 mothers (n = 300 responses)**

Type of home available fluids used	Number (%)
Kanji (rice water) with salt*	159 (53.0)
Grape Juice/ Fruit juice	29 (9.7)
Lemon juice/ Lime juice	27 (9.0)
Salt and Sugar water*	23 (7.7)
Coconut water*	22 (7.3)
Rasam or daal water*	16 (5.3)
Sugar water	14 (4.7)
Salt water without sugar	11 (3.7)
Tea / Coffee	9 (3.0)
Milk	7 (2.3)
Others	5 (1.7)
Total	300 (100)

\* Fluids which are appropriate for oral rehydration

**Awareness regarding danger signs:** Only 19 out of 245 mothers (7.75%) answered at least one of the following danger signs: sunken eyes, poor feeding, lethargy or decreased activity and decreased skin turgor. Another 98 mothers (40%) mentioned persistent diarrhoea as a danger sign. Forty three per cent of the mothers told that they were not aware of any danger signs while 9.8% mothers answered incorrectly (Table 3).

**Table 3: Reasons for visit to a health facility if the child had diarrhoea (n = 245)**

Reasons stated	Mothers (%)
2 out of 4 signs of severe dehydration	3 (1.2)*
1 out of 4 signs of severe dehydration	16 (6.5)†
Fever, vomiting, increased crying or abdominal pain	24 (9.8)
Persistent diarrrhea	98 (40.0)
Didn't know	104 (42.5)
Total	245 (100)

\* 3 identified poor feeding and lethargy both; † 3 identified poor feeding alone while 13 identified lethargy alone

**Treatment seeking behaviour:** All the 20 children who had diarrhoea in the past one month had received some form of oral rehydration. Out of these only one child had severe diarrhoea. Eight children had received ORS, five had received home available fluids and another seven had received both. Nineteen mothers sought medical care, of which 15 went to the Urban Health Centre and four went to private practitioners. Only five children were given zinc supplements. In three out of four private consultations, antibiotics were prescribed for diarrhoea.

**Risk factors for lack of knowledge regarding ORS and home-fluids:** We analysed the demographic variables such as young mothers aged up to 25 years, per capita income in family up to Rs 1000 per month and education only till class eight as plausible risk factors for the lack of knowledge of ORS preparation. On univariable analysis, mothers with low per capita income and those educated only till class eight were less likely to know about ORS preparation compared to their counterparts (OR = 1.96, 95% CI 1.08 - 3.57, P = 0.03 and OR = 2.43, 95% CI 1.33 - 4.44, P = 0.004 respectively). Young age was not found to be significantly associated with lack of knowledge of ORS preparation (OR = 0.85, 95% CI 0.47 - 1.54, P = 0.59). However on doing multivariable analysis, low level of education alone emerged as a risk factor for the lack of knowledge of ORS preparation (Table 4).

**Table 4: Multivariable adjusted analysis of risk factors for the lack of knowledge regarding ORS preparation (n = 245)**

Independent variable	Odds ratio (95% CI)	P value
<b>Age (in years)</b>		
≤ 25	1.21 (0.66 - 2.22)	0.54
> 25	1	
<b>Per capita monthly income (Rs)</b>		
≤ 1000	1.57 (0.83 - 2.95)	0.16
> 1000	1	
<b>Mother's education</b>		
Up to eight years	2.15 (1.14 - 4.05)	0.02
More than eight years	1	

Hosmer-Lemeshow goodness-of-fit Chi-Square = 1.48, df = 6, P = 0.96.

Similarly, we analysed the probable risk factors for the lack of knowledge about home available fluids for rehydration. Out of young age, lower per capita income and lack of education, none were found to be significant risk factors for the lack of knowledge regarding home available fluids (OR = 1.90, 95% CI 0.96 - 3.78, P = 0.07; OR = 1.16, 95% CI 0.60 - 2.25, P = 0.67 and OR = 1.55, 95% CI 0.80 - 3.00, P = 0.20 respectively).

## DISCUSSION

Low awareness of the biological cause of diarrhoea was as per our expectation. Instead, about half the mothers in our study stated the modes of spread of infection as a cause of diarrhoea. We found that

awareness of mothers regarding the methods of prevention was related to their awareness of cause of diarrhoea. For as many as one-thirds of caregivers there is a definite scope for improvement regarding awareness of spread and prevention of diarrhoea.

Awareness of the under-five mothers regarding ORS and its use during diarrhoea was high compared to another study done in Aligarh, India and comparable to that of a Nigerian study.<sup>6,7</sup> The awareness of home available fluids for rehydration was higher in our study compared to the Aligarh study.<sup>6</sup> However, the awareness regarding salt and sugar solution as a home-made ORS was found to be low in our study. This might be explained by the urban setting of the study with ready availability of packet ORS at low or zero cost, thereby rendering home-made ORS unnecessary. Half the mothers had a wrong impression that ORS needed to be discontinued if diarrhoea persisted or vomiting developed. This is a cause of concern which needs to be rectified through health education.

Knowledge regarding continuation of feeding during diarrhoea was found superior in our study compared to that of other Indian studies done at Aligarh and Delhi.<sup>6,8</sup> On the other hand, knowledge of specific warning signs related to severe dehydration was low. Thus there is a need to train the mothers regarding the danger signs of severe dehydration. It was found that severity of diarrhoea was judged by mothers based on its duration and not on the basis of danger signs which are suggestive of severe dehydration.

In our study, all the children had received some form of oral rehydration. This was similar to a study done in rural Gujarat where oral rehydration was given for 90.6% of the diarrhoea episodes.<sup>9</sup> Also, oral rehydration was remarkably better in our study compared to the national average of 48% as per the NFHS-3 survey.<sup>10</sup> Medical consultations were found to be widespread which was also found in earlier studies.<sup>5,8</sup> Such treatment-seeking behaviour might be explained by the easy availability of both public and private health facilities in this urban area. While this in itself might not be a cause of concern, the practice of oral rehydration at home still needs to be promoted which would help in early reduction in dehydration even before the visit to the doctor.

We found that consultations resulted in antibiotic prescriptions. This practice has also been described elsewhere.<sup>11,12</sup> In earlier studies, this has mostly been attributed to parental expectations and the urge for placebo therapy.<sup>12</sup> On the other hand, the prescription of zinc was low even though its efficacy is proven.<sup>13</sup> Thus mothers need to be made aware of the danger of unnecessary prescriptions in diarrhoea.

Number of mothers assessed by us for practice was low as we queried only the mothers of those children who developed diarrhoea within the past month, in order to avoid recall bias. Also, we might have slightly overestimated the knowledge of ORS preparation as it

was based on self-report rather than actual demonstration of ORS preparation.

Our findings suggest that higher education levels were associated with higher presence of knowledge of ORS preparation while there was no effect of age of mothers. Focused health education of mothers has been shown to improve their knowledge and practice regarding diarrhoea and oral rehydration in earlier studies.<sup>14,15</sup> This reaffirms the importance of women's education in reducing diarrhoea morbidity and mortality through the correct use of ORS. Although the awareness regarding home available fluids was high, there was a large variety of these fluids being used with at least one-fourths of them not suitable for oral rehydration. Thus ORS should be primarily used for oral rehydration while appropriate home available fluids might be used as supplement or only when ORS is not available.

## CONCLUSION

Low education in mothers was found to be a hindering factor for the appropriate utilisation of ORS in the community. Although awareness regarding spread of diarrhoea and ORS was adequate in this community, knowledge regarding continuation of feeding and danger signs was deficient. Thus educating the mothers of under-five children regarding correct practices of home management of diarrhoea is likely to further reduce diarrhoea morbidity and mortality.

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