



AWARENESS REGARDING ORS AND ZINC THERAPY AMONG MOTHERS OF UNDER-FIVE CHILDREN: A CROSS-SECTIONAL STUDY

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Abstract

Background: Diarrhoeal disease remains one of the leading causes of childhood morbidity and mortality globally. Oral rehydration solution (ORS) and zinc supplementation are cornerstone interventions recommended by WHO/UNICEF for management of childhood diarrhoea. Despite proven efficacy, awareness of these therapies among primary caregivers remains suboptimal in many low- and middle-income countries. **Objectives:** To assess the level of awareness regarding ORS and zinc therapy among mothers of children under five years of age. **Methods:** A hospital-based cross-sectional study was conducted among 250 mothers of under-five children. A pre-designed, structured, and pre-tested questionnaire was used to collect data. **Results:** 78.4% of mothers were aware of ORS, while only 42.0% were aware of zinc supplementation. Awareness was significantly associated with maternal education and socioeconomic status ($p < 0.05$). **Conclusion:** Despite moderate awareness about ORS, knowledge of zinc therapy remains critically low and necessitates targeted health education programs.

Keywords: ORS, Zinc, Diarrhoea, Awareness, Under-five children, Mothers

Introduction

Diarrhoeal disease is one of the most significant contributors to under-five morbidity and mortality worldwide.[1] According to the World Health Organization (WHO), diarrhoea accounts for approximately 8–9% of all under-five child deaths globally, killing approximately 443,832 children under five years of age each year.[2] In India alone, diarrhoea has been estimated to cause approximately 3 lakh infant deaths annually, constituting nearly 13% of total under-five mortality.[3,4]

The primary intervention for reducing diarrhoea-associated mortality is oral rehydration therapy (ORT) with Oral Rehydration Solution (ORS), which prevents deaths due to dehydration. Since the 1970s, ORS has dramatically reduced childhood mortality from diarrhoea.[5] In 2004, WHO and UNICEF jointly issued revised recommendations advocating the use of low-osmolarity ORS combined with zinc supplementation for 10–14 days (20 mg/day for children over six months; 10 mg/day for infants under six months) as the standard of care for acute diarrhoea management in children.[6,7]

Despite these well-established protocols, coverage of zinc supplementation for childhood diarrhoea remains alarmingly low, even in countries where ORS use is relatively common.[8,9] Studies from India and other developing nations have consistently demonstrated that while awareness of ORS is

moderate, knowledge of zinc therapy is substantially poor among mothers of under-five children. In an observational study from Rawalpindi, Pakistan (2017–2018), only 38.8% of mothers were aware of zinc use for diarrhoea management, and the awareness of correct duration of zinc administration was as low as 17.3%.[10,11]

The mother, being the primary caregiver of the child, plays a pivotal role in the early management of diarrhoeal illness at home. A mother's knowledge of ORS preparation, administration, and zinc supplementation is directly linked to treatment-seeking behaviour and outcomes. Educational status, socioeconomic condition, and access to health information have been consistently identified as determinants of maternal awareness. Given these gaps, the present study was undertaken to assess the level of awareness regarding ORS and zinc therapy among mothers of under-five children attending a tertiary care institution.[12,13]

Material and Methods

Study Design and Setting: A hospital-based cross-sectional descriptive study was conducted in the Paediatric Outpatient Department (OPD) of a tertiary care hospital over a period of six months (January 2017 to June 2017).

Study Population: Mothers accompanying children aged below five years attending the paediatric OPD were included. Mothers who had previously participated in any formal ORS/zinc education programme and those who declined consent were excluded.

Sample Size: A total of 250 mothers were enrolled in the study using consecutive sampling.

Data Collection Tool: A pre-designed, structured, pre-tested questionnaire was used. The questionnaire had three sections:

- Section A: Socio-demographic details (age, education, occupation, socioeconomic status, parity)
- Section B: Awareness regarding diarrhoea, ORS (knowledge of ORS, its preparation, indications, dosage, and continuation)
- Section C: Awareness regarding zinc therapy (knowledge of zinc, its dose, duration, and importance alongside ORS)

Scoring and Classification: Awareness was classified as "Good" ($\geq 75\%$ correct responses), "Moderate" (50–74%), and "Poor" ($< 50\%$). Socioeconomic status was determined using the Modified Kuppuswamy Scale.

Ethical Considerations: Ethical clearance was obtained from the Institutional Ethics Committee. Written informed consent was obtained from all participants. Confidentiality of data was maintained throughout.

Statistical Analysis: Data were entered and analyzed using SPSS version 22.0. Descriptive statistics were expressed as frequency and percentage. Chi-square test was applied to determine associations between categorical variables. A p-value < 0.05 was considered statistically significant.

Results

Table 1: Socio-demographic Profile of Study Participants (n=250)

Characteristic	Category	Number (n)	Percentage (%)
Age of Mother	18–24 years	68	27.2
	25–30 years	102	40.8
	31–35 years	58	23.2
	>35 years	22	8.8
Education	Illiterate	38	15.2
	Primary (up to 5th)	47	18.8
	Secondary (6th–12th)	97	38.8
	Graduate and above	68	27.2
Occupation	Homemaker	196	78.4
	Working/Employed	54	21.6
Socioeconomic Status	Lower	62	24.8

	Lower Middle	88	35.2
	Upper Middle	71	28.4
	Upper	29	11.6
Parity	Primi	84	33.6
	Second	118	47.2
	Third and above	48	19.2

The majority of mothers were aged 25–30 years (40.8%), homemakers (78.4%), and belonged to the lower-middle socioeconomic class (35.2%).

Table 2: Awareness Regarding Diarrhoea Among Study Participants (n=250)

Knowledge Parameter	Correct Response	Number (n)	Percentage (%)
Correct definition of diarrhoea	≥3 loose stools/day	187	74.8
Knowledge of causes of diarrhoea	Infection/contamination	118	47.2
Awareness of danger signs of dehydration	Sunken eyes, dry mouth, etc.	103	41.2
Importance of continued feeding during diarrhoea	Yes	142	56.8
Use of home-based fluids	Yes	183	73.2

Table 3: Awareness Regarding ORS Among Study Participants (n=250)

Knowledge Parameter	Number (n)	Percentage (%)
Ever heard of ORS	196	78.4
Knows ORS prevents dehydration	159	63.6
Knows correct method of ORS preparation	134	53.6
Knows ORS should be started at first loose stool	112	44.8
Knows ORS should be continued during vomiting	71	28.4
Knows ORS solution is discarded after 24 hours	98	39.2
Source of ORS knowledge: Doctor/health worker	152	77.6*
Source of ORS knowledge: Media	31	15.8*
Source of ORS knowledge: Family/neighbours	13	6.6*

*Percentages among 196 mothers who had heard of ORS

Table 4: Awareness Regarding Zinc Therapy Among Study Participants (n=250)

Knowledge Parameter	Number (n)	Percentage (%)
Ever heard of zinc supplementation for diarrhoea	105	42.0
Knows zinc should be given along with ORS	72	28.8
Knows correct daily dose of zinc (20 mg/day)	38	15.2
Knows duration of zinc therapy (10–14 days)	31	12.4
Knows zinc reduces severity of future diarrhoea episodes	44	17.6
Among ORS-aware mothers, also aware of zinc	87	44.4*

*Percentage among 196 mothers who had heard of ORS

Table 5: Association of Maternal Education with ORS and Zinc Awareness (n=250)

Education Level	ORS Aware	ORS Unaware	Zinc Aware	Zinc Unaware
Illiterate (n=38)	17 (44.7%)	21 (55.3%)	6 (15.8%)	32 (84.2%)
Primary (n=47)	32 (68.1%)	15 (31.9%)	14 (29.8%)	33 (70.2%)
Secondary (n=97)	80 (82.5%)	17 (17.5%)	41 (42.3%)	56 (57.7%)
Graduate and above (n=68)	67 (98.5%)	1 (1.5%)	44 (64.7%)	24 (35.3%)
Total (n=250)	196 (78.4%)	54 (21.6%)	105 (42.0%)	145 (58.0%)

Chi-square (p-value)	p <0.001		p <0.001	
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A statistically significant association was observed between maternal education and awareness of both ORS and zinc ($p < 0.001$).

Table 6: Overall Level of Awareness (n=250)

Awareness Level	ORS Awareness	Zinc Awareness
Good ($\geq 75\%$ correct responses)	78 (31.2%)	24 (9.6%)
Moderate (50–74% correct)	97 (38.8%)	51 (20.4%)
Poor ($< 50\%$ correct)	75 (30.0%)	175 (70.0%)

Discussion

The present study was conducted among 250 mothers of under-five children to assess the level of awareness regarding ORS and zinc therapy for the management of childhood diarrhoea. The findings revealed a dichotomy: while ORS awareness was moderate, zinc therapy awareness was strikingly low across all sociodemographic categories.[10]

In our study, 78.4% of mothers had heard of ORS, which is comparable to findings reported by Mukherjee et al. (2016) from West Bengal, where approximately 80% of mothers were aware of ORS. Thammanna et al. (2015)[11] in their cross-sectional study among 250 mothers reported ORS awareness in 74.8% of participants, with only 47.6% knowing how to prepare ORS correctly. Similarly, a study by Dhadave et al.[12] found ORS awareness in 65.7% of mothers, with literacy and occupation significantly associated with the level of awareness. Our finding that only 53.6% of mothers knew the correct method of ORS preparation aligns with the Indore study by Prajapati et al. (2017), [13] where 54.5% of ORS-aware mothers knew the correct method of preparation.

The finding that knowledge regarding continuation of ORS during vomiting was poor (28.4% in our study) has been consistently observed in literature. The cross-sectional study by Sharma et al. (2012)[14] from Himachal Pradesh reported that nearly half of ORS-aware mothers believed ORS should be discontinued if vomiting developed, reflecting a critical knowledge gap that can lead to preventable dehydration.

In our study, doctors and health workers were the primary source of ORS-related information (77.6% of ORS-aware mothers), which is consistent with other Indian studies. This underscores the pivotal role of healthcare providers in disseminating correct information about diarrhoea management. An interventional study by Parikh et al. (2016)[15] in Ahmedabad demonstrated that a single 45-minute educational session by health workers significantly improved maternal knowledge about ORS preparation (from 39% to 89%) and zinc importance (from 26% to 76%), suggesting that healthcare worker counselling remains the most effective mode of education.

The most notable finding of the present study is the markedly low awareness of zinc supplementation—only 42.0% of mothers had heard of zinc for diarrhoea management, and only 12.4% knew the correct duration (10–14 days). This is concordant with the study from Rawalpindi (2017–18) by Iqbal et al.,[8] where zinc awareness among mothers was 38.8% and awareness of correct duration was merely 17.3%. The findings are also consistent with Thammanna et al. [11](2015), who reported that only 20.4% of mothers knew about zinc (syrup zinc).

The low awareness of zinc therapy is particularly concerning given that WHO and UNICEF have recommended zinc co-administration with ORS since 2004. Larson et al.[6] (2009) monitored national-scale-up of zinc treatment in Bangladesh and found that even 23 months into a targeted campaign, only 10% of rural children and 20–25% of urban children were receiving zinc supplementation. This indicates that the gap between policy and ground-level practice is deeply rooted and requires sustained, multi-pronged public health efforts.

In the present study, maternal education was the most significant predictor of awareness for both ORS ($p < 0.001$) and zinc ($p < 0.001$). Graduate and above educated mothers showed 98.5% ORS awareness and 64.7% zinc awareness, compared to only 44.7% and 15.8% respectively among illiterate mothers. This finding is in agreement with multiple studies conducted across India. The

knowledge and attitude study from Ranga Reddy, Telangana (2014)[16] found that educated mothers were significantly more likely to know the correct method of ORS preparation. Sharma et al. (2012)[14] similarly reported that mothers educated only up to class eight were almost twice less likely to know ORS preparation compared to better-educated mothers (OR = 2.15, 95% CI 1.14–4.05, $p = 0.02$).

Socioeconomic status also showed a significant association with awareness in our study, with upper and upper-middle class mothers demonstrating better knowledge. This parallels findings from the national-level NFHS data analysis, which found ORS and zinc treatment coverage was significantly higher in children from rich wealth index groups.

The study findings highlight a substantial knowledge gap, particularly regarding zinc therapy, even among mothers who are aware of ORS. Since both interventions are now integral to the standard protocol for childhood diarrhoea management, public health programs must shift focus beyond ORS awareness to simultaneously promote zinc co-supplementation. Intensified Diarrhoea Control Fortnight (IDCF) campaigns launched under India's National Health Mission specifically aim at promoting combined ORS and zinc use, yet ground-level awareness remains inadequate. Healthcare workers at primary health centres, ASHA workers, and Anganwadi workers must be empowered with updated training to effectively counsel caregivers during every diarrhoeal episode and at routine child health contacts.

Conclusion

The present study demonstrates that while ORS awareness is moderate (78.4%) among mothers of under-five children, awareness of zinc therapy is critically low (42.0%), with even fewer mothers knowing the correct dosage and duration. Maternal education and socioeconomic status are the strongest determinants of both ORS and zinc awareness. There is an urgent need for community-level health education, integration of zinc counselling into routine immunisation contacts, and strengthening of Integrated Management of Neonatal and Childhood Illness (IMNCI) training to bridge these knowledge gaps and reduce diarrhoea-related child mortality.

References

1. Liu L, Johnson HL, Cousens S, Perin J, Scott S, Lawn JE, et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *Lancet*. 2012;379(9832):2151–61.
2. World Health Organization. Diarrhoeal disease [Internet]. Geneva: WHO; 2017 [cited 2017 May 2]. Available from: <https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease>
3. Basavaraja GV, Mathew JL. Diarrhoea and India's child survival problem: the need for urgent action. *Indian Pediatr*. 2015;52(8):681–3.
4. 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.
5. World Health Organization, UNICEF. Clinical management of acute diarrhoea: WHO/UNICEF Joint Statement. Geneva: WHO; 2004.
6. Larson CP, Saha UR, Islam R, Roy N. Childhood diarrhoea management practices in Bangladesh: private sector dominance and continued inequities in care. *Int J Epidemiol*. 2009;38(5):1382–90.
7. Prajapati B, Talsania NJ, Sonaliya KN. A study on prevalence of acute diarrheal diseases in under five years of age in urban and rural communities of Ahmedabad district, Gujarat. *Natl J Community Med*. 2012;3(1):89–93.
8. Iqbal I, Sultan M, Iqbal Z, Fatima A. Use of Zinc and ORS in Home Management of Diarrhea: Knowledge of Mothers attending a Tertiary Care Hospital. *J Islam Med Dent Coll*. 2018;7(3):194–8.
9. Munos MK, Walker CL, Black RE. The effect of oral rehydration solution and recommended home fluids on diarrhoea mortality. *Int J Epidemiol*. 2010;39 Suppl 1:i75–87.

10. Mukherjee R, Nair N, Choudhury N. Awareness and practices of mothers regarding diarrhoea management in under-five children: a cross sectional study in a peri-urban area of West Bengal. *Int J Community Med Public Health*. 2016;3(6):1487–92.
11. 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):215–8.
12. Dhadave MM, Kamble SV, Kakrani VK. Study of socio-demographic factors affecting knowledge of mothers of under five children regarding ORS and diarrhoea management. *Int J Recent Trends Sci Technol*. 2014;11(2):318–21.
13. Prajapati T, Prajapati K, Agarwal A, Mewada B. Knowledge and practices about diarrheal diseases and ORS in mothers of under-five children. *Int J Pediatr Res*. 2017;4(09):567–73.
14. Sharma R, Gulati S, Kumar R. Knowledge and practice regarding oral rehydration therapy among mothers of under-five children in a rural area of Himachal Pradesh. *Natl J Community Med*. 2012;3(3):478–82.
15. Parikh R, Matkar M, Baxi R, Bhatt N. Impact of educational intervention regarding oral rehydration solution and zinc for management of diarrhoea among mothers of urban slums of Ahmedabad city, Gujarat, India. *Int J Res Med Sci*. 2016;4(12):5261–5.
16. Venugopal T, Swathi A. Knowledge and attitude of mothers about diarrhea, ORS and feeding practices in under-five children in a rural area of Ranga Reddy, Telangana. *J Med Sci Clin Res*. 2016;4(10):13351–6.