

Practice of using ORS among mothers of children under five-year with acute Diarrhea at Tay Nguyen regional general hospital

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Abstract

This study aimed to describe the practice of using Oral Rehydration Solution (ORS) among mothers of children under five years old with acute diarrhea at Tay Nguyen Regional General Hospital and to identify factors influencing this practice. A cross-sectional survey was conducted with 216 mothers of children under five years old with acute diarrhea using structured questionnaires. The results showed that the proportion of mothers with correct knowledge of ORS preparation was 51.85%, while the rate of correct practice was 52.31%. There was a statistically significant relationship between correct knowledge and correct practice in using ORS ($p < 0.001$). Mothers with correct knowledge of ORS were more likely to practice correctly than those with incorrect knowledge (OR=4.16; $p < 0.001$). These findings highlight the need for enhanced health education to improve ORS use and reduce diarrhea-related complications in young children.

Keywords: ORS, Practice, acute diarrhea, children

1. Introduction

Diarrhea remains one of the leading causes of morbidity and mortality among children under five years of age, especially in developing countries. According to the United Nations Children's Fund (UNICEF), it accounted for approximately 9% of all deaths in this age group globally in 2021 (UNICEF, 2024). In addition, according to the World Health Organization (WHO) there are around 1.7 billion children who experience diarrheal disease every year, and dehydration is the most severe threat of diarrhea. While WHO also recommends ORS as the first-line treatment for dehydration due to diarrhea (WHO, 2024) [10]. Mothers play an important role in the early recognition and management of childhood diarrhea. Their knowledge and practical skills in preparing and administering ORS are crucial for ensuring its effectiveness and for preventing complications related to dehydration (Nguyen Thi Bong, *et al.*, 2022) [1]. However, numerous studies showed that maternal knowledge and practice regarding using ORS in caring for children with diarrhea are quite low. For instance, Nitish Garg *et al.* (2019) [6] documented that only 37% of mothers in India correctly identified that one ORS packet should be mixed with 1,000 ml of water, and 55.9% had no idea of the correct amount. In Vietnam, Huynh Thuy Hang *et al.* (2015) found that only 65% of mothers practiced correct ORS usage, while Le Thi Xuan (2015) [5] reported an even lower figure at 40.2%.

Mothers' knowledge and skills in preparing and using ORS to rehydrate and restore electrolytes for children with acute

diarrhea play a critical role in promoting faster recovery, reducing hospitalization rates, alleviating pressure on the healthcare system, and empowering mothers to manage future episodes of diarrhea more effectively. Therefore, this study was conducted at Tay Nguyen Regional General Hospital to evaluate the practice of ORS use among mothers of children under five with acute diarrhea.

2. Materials and Methods

- **Study Design:** This was a cross-sectional descriptive study. This research was conducted at Tay Nguyen Regional General Hospital, Vietnam between July 2023 and June 2024.
- **Research subjects:** Mothers of children under 5 years old with acute diarrhea at the Central Highlands General Hospital.
- **Inclusion criteria:** Agree to participate in the study
- **Exclusion criteria:** Mothers with children with severe dehydration diarrhea or who were mentally ill and those who failed to provide informed consent
- **Research sample:** Select the entire sample. Select all eligible subjects during the study period to be selected for the study. A total of 216 subjects participated in the study.
- **Data analysis:** data was analyzed through: descriptive statistics and analytical statistics. Using the Chi-square test to test the independence between 2 categorical variables.
- **Ethical Approval:** The research was conducted after

being approved by the Scientific Council of Tay Nguyen University. Participants were clearly explained the purpose and content of the research and data collection was only conducted when the subject agreed to participate.

3. Research Results

3.1 Characteristics of study participants

Among the 216 mothers surveyed (Table 1), most of

participants were over 25 years old (65.74%). The majority of the participants were of Kinh ethnicity (56.48%), followed by Ê Đê (22.69%) and other ethnic groups (20.83%). Most mothers lived in rural areas (75%) and had an education level of high school or lower (72.68%). Regarding family size, 78.24% had two children or fewer. Only 15.74% were government employees. The proportion of mothers with correct knowledge of ORS preparation was 51.85%.

Table 1: General characteristics of study participants (N=216)

Characteristics	Category	Frequency (N)	Percentage (%)
Age	≤ 25 years old	74	34.26
	> 25 years old	142	65.74
Ethnicity	Kinh	122	56.48
	Ê Đê	49	22.69
	Others	45	20.83
Residence	Rural	162	75.00
	Urban	54	25.00
Education level	≤ High school	157	72.68
	> High school	59	27.32
Number of children	≤ 2 children	169	78.24
	> 2 children	47	21.76
Occupation	Government employees	34	15.74
	Others	182	84.22
Knowledge about ORS	Correct	112	51.85
	Incorrect	104	48.14

3.2 Practice of ORS use among mothers of children under five with acute diarrhea

Table 2: The practice of using ORS of study participants (N=216)

Practice Description	Frequency (N)	Percentage (%)
Washed hands with soap and clean water before preparing the ORS	176	81.48
Used clean preparation utensils	216	100.00
Checked the contents of the ORS packet, expiration date, and for punctures or clumping	190	87.96
Measured exactly 1 liter or 200 ml (depending on the packet type) of clean water	169	78.24
Located the indicated cutting position on the ORS packet, gently tapped the packet, and cut as directed	177	81.94
Tilted the packet at the cutting angle and poured the entire packet into a container of water	179	82.87
Checked the color and texture of the powder as it was being poured	151	69.91
Used the full contents of the packet in a single preparation	181	83.80
Stirred thoroughly until completely dissolved	190	87.96
Covered the container with a lid	192	88.89
Poured the ORS solution into a glass and tasted using a spoon	167	77.31
Administered the ORS to the child slowly, spoon by spoon	180	83.33
Stored the prepared ORS solution for up to 24 hours	207	95.83
Cleaned and stored the preparation utensils properly	211	97.69
Washed hands with soap and water after preparation	168	77.78

When preparing the ORS solution, 100% of mothers used clean utensils before mixing it for their children. While, 81.48% of the mothers washed their hands properly before preparation, and 87.96% of them checked the ORS packet for content, expiry date, and whether it was punctured or clumped. Approximately three-quarters (78.24%) of the participants measured the correct amount of boiled and cooled water. The proportion of mothers who used the entire

ORS packet in one preparation was 83.80%, and 87.96% stirred the solution thoroughly before giving it to the child. Around four-fifths (83.33%) of the mother gave the solution slowly to their children using a spoon. Almost all mothers (95.83%) stored the prepared solution for up to 24 hours, and 97.69% cleaned and rinsed the utensils after use. About three-quarters (77.78%) washed their hands after preparing ORS for their children.

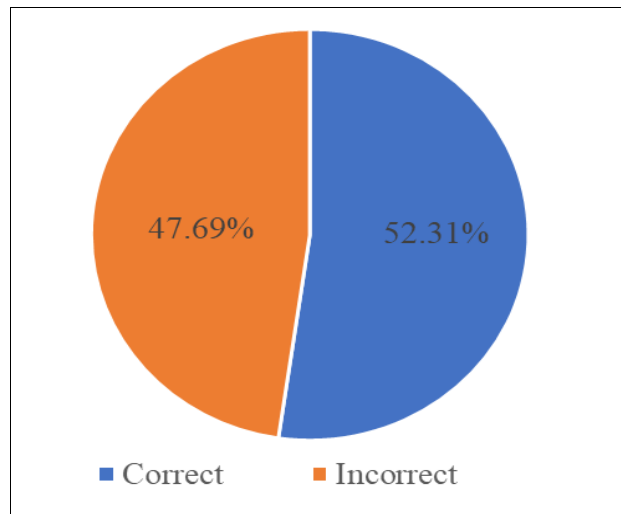


Fig 1: Classification of ORS practice among mothers of children under five with acute diarrhea (n=216)

In total, 52.31% of the mothers had correct practice in preparing and applying ORS for their children.

3.3 Factors associated with correct ORS practice

In this study, the Chi-square test was used to examine the association between various factors including age, ethnicity,

number of times caring for a child with diarrhea, occupation, and education level and correct practice in using ORS, with a significance level of 0.05. The aim was to improve mothers’ ability to properly prepare ORS for children with acute diarrhea.

Table 3: Factors associated with correct practice in using ORS (N=216)

Characteristics		Practice		P-Value	OR (95%-CI)
		Correct	Incorrect		
Age	≤ 25	35	39	0.29	1.36 (0.74-2.48)
	>25	78	64		
Ethnicity	Kinh	68	54	0.25	1.37 (0.41-1.296)
	Khác	45	49		
Number of times caring for a child with diarrhea	First time	67	61	0.99	0.997 (0.56-1.78)
	Two or more times	46	42		
Occupation	Government employees	22	12	0.12	1.83 (0.23-1.24)
	Other	91	91		
Education level	≤ High school	86	71	0.24	0.696 (0.36-1.33)
	> High school	27	32		
Knowledge about ORS	Correct	77	35	< 0.001	4.16 (2.27-7.64)
	Incorrect	36	68		

There was no significant difference in correct ORS practice between mothers aged 25 and below and those over 25 (P=0.29). While Kinh mothers demonstrated a higher rate of correct practice compared to ethnic minority mothers, the difference was not statistically significant (P=0.25). Similarly, there was no significant difference between mothers caring for a child with diarrhea for the first time and those with previous experience (P=0.99).

Regarding occupation, government employees had 1.83 times higher odds of correct practice compared to mothers in other jobs, but this was not statistically significant (P=0.12). Mothers with education beyond high school had lower odds of correct practice (OR=0.696) compared to those with a high school education or less. This difference was also not statistically significant (P=0.24).

Notably, mothers with correct knowledge of ORS were more than four times as likely to practice correctly compared to those with incorrect knowledge. This association was statistically significant (p<0.001; OR=4.16; 95% CI: 2.27-7.64).

4. Discussion

4.1 Practice of ORS use among mothers of children under five with acute diarrhea

The study showed that only 52.31% of mothers practiced correct ORS preparation and administration, despite a relatively high rate of correct steps performed individually. For example, 87.96% of mothers checked the ORS packet for expiry date and physical integrity, which was higher with findings by Le Thi Xuan (2015) [5], who reported at 85.6%. In addition, 78.24% measured the correct volume of water (1 liter or 200 ml), similar to the result from Nguyen Thi Kim Quyen (2019) at 78%, and slightly higher than the result from the study of Vo Thi Thu Huong *et al.* (2023) at 76.7%. Furthermore, 81.94% of mothers cut the ORS packet correctly. This rate is significantly higher than the 23.3% reported by Vo Thi Thu Huong *et al.* (2023). Proper packet handling is critical to ensuring full powder usage and correct concentration.

The study also found that 83.80% of mothers used the entire ORS packet in one preparation, and 95.83% stored the

solution for up to 24 hours, higher than the 87.1% in the study of Le Thi Xuan (2015) [5].

Despite these positive findings, the overall correct practice rate (52.31%) remains moderate and lower than the 65% reported by Huynh Thuy Hang *et al.* (2015), and slightly lower than the 57.5% reported by Nguyen Thi Bong *et al.* (2022) [1]. Several factors may contribute to this, including the relatively low education level among participants, with nearly 73% having only high school education or less. Additionally, the availability of pre-prepared ORS at the hospital may limit mothers' opportunities to practice the preparation themselves, leading to passive use and limited skill development.

4.2 Factors associated with correct ORS practice

Using the Chi-square test with a 95% confidence interval, the study found a statistically significant association between mothers' knowledge and their practice of ORS usage. Specifically, mothers with correct knowledge were 4.16 times more likely to practice ORS preparation correctly than those without ($p < 0.001$; OR=4.16; 95% CI: 2.27-7.64). This result is consistent with the findings of Nguyen Thi Bong *et al.* (2022) [1], although their study reported a stronger association (OR=22.94; 95% CI: 6.55-80.22; $p < 0.001$).

These findings suggest that equipping mothers with accurate knowledge of ORS preparation significantly improves their ability to manage acute diarrhea at home. Proper practice reduces hospitalization rates, eases the burden on healthcare services, and enables mothers to better care for their children during future episodes of diarrhea. Therefore, educational interventions that enhance mothers' knowledge are crucial to improving child health outcomes, especially in rural and underserved communities.

5. Conclusion

The proportion of mothers correctly preparing ORS for their children remains low (51.85%). Mothers with adequate knowledge of ORS tend to practice better. Therefore, it is essential to enhance the role of healthcare workers in educating and guiding mothers to improve both knowledge and practice in ORS use, thereby strengthening the quality of care and treatment as well as promoting effective home-based prevention and management of acute diarrhea.

Conflict of Interest

Not available

Financial Support

Not available

6. References

1. Bong NT, Trang NT, LY NT, Thanh NTH. Status of knowledge, attitudes and practice on ORS use among mothers of children under 5 with acute diarrhea at the Pediatrics Department, Ha Dong General Hospital in 2022. *Viet Med J.* 2022;529(2). DOI: 10.51298/VMJ.V529I2.6509.
2. Hang NT, Thuy LM, Hung TT. Ca Mau Obstetrics and Pediatrics Hospital. Accessed April 19, 2024. Available from: [http://www.bvsannhicamau.vn/hoat-dong/10/nghien-cuu-khoa-hoc/khao-sat-kien-thuc-thai-](http://www.bvsannhicamau.vn/hoat-dong/10/nghien-cuu-khoa-hoc/khao-sat-kien-thuc-thai-do.html)

[do.html](http://www.bvsannhicamau.vn/hoat-dong/10/nghien-cuu-khoa-hoc/khao-sat-kien-thuc-thai-do.html)

3. Huong VTT, Thao LT. Status of knowledge on initial management of diarrhea among mothers of under-5 children at the Gastroenterology Department, Thai Binh Pediatric Hospital. *Viet Med J.* 2023;526(2):272-275. DOI: 10.51298/VMJ.V526I2.5569.
4. Quyen NTK. Knowledge and practice of ORS preparation among mothers of children under 5 with diarrhea and associated factors. *J Sci. Tay Nguyen Univ.* 2018;37(2019):79-86.
5. Le Thi Xuan. Practice of ORS preparation among mothers of under-5 children and related factors. Master's thesis, University of Medicine and Pharmacy, Ho Chi Minh City, 2015.
6. Garg N, Kikon S, Ramesh RM, Garg SC. Knowledge, attitude and practices of childhood diarrhoea among mothers of children under five years of age: A cross-sectional study. *Int J Community Med Public Health.* 2019;6(11):4754-464. DOI: 10.18203/2394-6040.IJCMPH20195051.
7. Qureshi R, Baloch F, Kazi NH, Qureshi I, Kousar T. Level of knowledge among mother's uses of ORS therapy in diarrhea under 5 years of children. *Pak J Med Health Sci.* 2022;16(10):466.
8. Noban ALMS, Elnimeiri MK. Knowledge, attitudes and practices of mothers on management of childhood diarrhoea among children under five years in AL Mukalla City/Yemen-2022. *Pak J Med Health Sci.* 2022;16(07):827.
9. UNICEF. Diarrhoea remains a leading killer of young children, despite the availability of a simple treatment solution. Accessed April 19, 2024. Retrieved from: <https://data.unicef.org/topic/child-health/diarrhoeal-disease>
10. World Health Organization (WHO). Diarrhoeal disease. Accessed April 19, 2024. Available from: <https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease>.

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