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Predictors Of Oral Rehydration and Zinc for Treatment of Diarrhoea Among Children in Rivers State, Nigeria

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Abstract

The treatment of diarrhoea among under-five children with oral rehydration salts (ORS) and zinc supplementation has been a cornerstone in reducing child mortality. The study investigated the predictors of oral rehydration and zinc for treatment of diarrhoea among children in Rivers State. The study adopted descriptive cross-sectional survey. Three research questions and three hypotheses guided the study. The target population of this study comprised 400 nursing mothers attending treatment of Diarrhoea in four selected health facilities in Rivers State during the 2024 annual year. The sample size consisted of 80 nursing mothers selected using the simple random sampling technique. A structured questionnaire titled: Predictors of Oral Rehydration and Zinc for Treatment of Diarrhoea in Children Questionnaire (PORZTDCQ) was used. Cronbach's Alpha analysis was used to establish a reliability index of 0.89. The frequency and percentage was used to analyse the demographic data, mean and standard deviation was used to answer research questions and Analysis of Variance (ANOVA) tested hypotheses at 0.05 level of significant. The findings showed that parental education, family size, and socioeconomic status all predict the use of ORT and zinc for treating diarrhea among children under five in Rivers State. Educated and stable parents with smaller families and higher incomes are more likely to understand and apply ORT effectively. Conversely, large families and low-income households face challenges in consistent use. These results emphasize the importance of education, family stability, economic empowerment, and culturally sensitive health programs for improving child health outcomes. The researcher recommended among others that health educators should be conducting continuous parental enlightenment across hospitals to improve knowledge and awareness on oral rehydration therapy use for child wellness in all healthcare centers within Rivers State University Teaching Hospital and related institutions.

Keywords: *Diarrhoea, Oral Rehydration, Predictors, Treatment, Zinc.*

Introduction

Diarrhea is a disease of public health importance. Worldwide, there are about 1.7 billion cases of childhood diarrheal disease every year (World Health Organization [WHO], 2017). Diarrhea is the second leading cause of death in under-five children, as it kills nearly 525 000 children every year; it is also a leading cause of malnutrition under-five children (WHO, 2017). South Asia and sub-Saharan Africa bear the greatest burden of diarrheal disease (Centers for Disease Control and Prevention [CDC], 2013). The prevalence of diarrhea among under-five children in Nigeria is 10% (National Population Commission and ICF International [NPC and ICF], 2014). Diarrhea is the 6th leading cause of death among under-five children in Nigeria, accounting for about 10% of mortality (WHO, 2015). Diarrhea is defined as the passage of three or more loose or watery stools within a 24-hour period (WHO, 2017; Adams & Collins, 2021). Diarrhea is caused by a wide range of pathogens, including bacteria, viruses and

protozoa, most of which are spread by faeces-contaminated water. Rotavirus and Escherichia coli are the two most common causative agents of diarrhea in developing countries (WHO, 2005).

Diarrhea, a common yet impactful health issue, has both negative and positive effects on society. Negatively, it can lead to severe health complications and high mortality rates, particularly in low-income regions with limited access to clean water and healthcare services (Smith *et al.,* 2023). However, the response to diarrhea outbreaks often stimulates improvements in public health infrastructure and awareness, leading to enhanced sanitation practices and health education (Williams *et al.,* 2024). For instance, initiatives aimed at combating diarrhea have led to better water purification methods and increased immunization coverage (Mills & Sherry, 2021).

The combined prevalence of ORT and zinc use for treating diarrhea in children under five is inadequate, particularly in rural health centers. Jones *et al.* (2003) highlighted that while urban areas show higher combined usage rates, rural areas lag significantly behind due to challenges in healthcare access and awareness. Efforts to integrate both treatments in health policies are crucial for improving outcomes in these settings. Parental education is a critical predictor of ORT use for treating diarrhea in children under five. Higher educational levels correlate with increased utilization of ORT, as parents are more likely to understand and trust the treatment. Boschi-Pinto *et al.* (2008) emphasized that educational interventions targeting parents can significantly enhance ORT usage, particularly in underserved areas. Marital status plays a role in predicting the use of ORT for diarrhea treatment in children under five. Kosek *et al.,* (2003) suggested that married mothers are more likely to use ORT, possibly due to better support systems and access to information. This relationship underscores the importance of considering family dynamics in public health strategies.

Family size can influence the use of ORT and zinc for treating diarrhea in children under five, with smaller families typically showing higher usage rates. Bryce *et al.* (2005) stated that in larger families, resources might be stretched thin, leading to lower utilization of these treatments. Targeted interventions that address the needs of larger families could help improve treatment rates. Socioeconomic status is a significant predictor of ORT and zinc use for diarrhea treatment in children under five. Families with higher socioeconomic status are more likely to use these treatments, as they have better access to healthcare services and educational resources. Liu *et al.* (2015) highlighted the need for policies that address the disparities in access to ensure equitable treatment across different socioeconomic groups. Cultural beliefs and practices significantly affect the use of ORT and zinc for treating diarrhea in children under five. Santosham *et al.* (2010) noted that in some cultures, traditional remedies are preferred over modern treatments like ORT and zinc. Understanding and integrating cultural practices into public health initiatives can improve acceptance and use of these life-saving treatments. Despite the many short and long term health benefits of physical activity, controversies still remain on whether pregnant women should engage in safe physical exercise or not. This study therefore seeks to determine the predictors of oral rehydration and zinc use for under 5 children treatment of diarrhoea in urban and rural Health Centers in Rivers State.

Statement of the Problem

The researcher is motivated to carry out a thesis research work on the predictors of oral rehydration and zinc use for treating diarrhea among children under five in urban and rural health centers in Rivers State due to the alarming rates of child morbidity and mortality associated with diarrhea especially in rural areas in Rivers State and despite the availability of effective treatments like oral rehydration salts (ORS) and zinc in various health centres, the researcher discovered that their usage remained critically low, especially in rural areas. This discrepancy suggested underlying issues in awareness, accessibility, and healthcare delivery, which the researcher felt compelled to investigate. Furthermore, the stark contrast between urban and rural health outcomes highlighted the need for a deeper understanding of the factors influencing treatment of diarrhea uptake. As a health practitioner, it was observed that identifying these predictors was essential for developing targeted interventions to improve the adoption of ORS and zinc, ultimately reducing the burden of diarrhea and saving lives. This research was driven by a desire to address these gaps and contribute to better health outcomes for children in Rivers State. It was also observed that many mothers, particularly in rural areas, were not utilizing oral rehydration salts (ORS) and zinc for treating their children's diarrhea due to factors such as lack of awareness, reliance on traditional remedies, and limited access to healthcare facilities. To address these challenges, the researcher suggested that it is crucial to implement comprehensive community education programmes to raise awareness about the effectiveness of ORS and zinc, improve healthcare infrastructure in rural areas to enhance accessibility, and train healthcare workers to engage with the community more effectively, fostering trust and encouraging the adoption of these life-saving treatments among children with diarrhea in Rivers State.

Research Questions

The following research questions guided the study:

1. To what extent does parental education predict the use of ORT for treating diarrhea among children under 5 in Urban and Rural health centers in Rivers State?
2. To what extent does size of the family predict the use of ORT and zinc for treating diarrhea among children under 5 in Urban and Rural health centers in Rivers State?
3. To what extent does socioeconomic status predict the use of ORT and zinc for treating diarrhea among children under 5 in Urban and Rural health centers in Rivers State?

Hypotheses

The following null hypotheses were tested in the study:

1. Marital status does not significantly predict the use of ORT for treating diarrhea among children under 5 in Urban and Rural health centers in Rivers State.
2. Size of the family does not significantly predict the use of ORT and zinc for treating diarrhea among children under 5 in Urban and Rural health centers in Rivers State.
3. Socioeconomic status does not significantly predict the use of ORT and zinc for treating diarrhea among children under 5 in Urban and Rural health centers in Rivers State.

Methodology

Study Design: A descriptive cross-sectional survey design was adopted for this study.

Population of the Study: The target population of this study comprised 400 nursing mothers attending treatment of Diarrhoea in four selected health facilities in Rivers State during the 2024 annual year. However, the total number of nursing mothers attending treatment of Diarrhoea in each of the four selected health facilities in Rivers State that made up of 400 as a population size was recorded from Rivers State University Teaching Hospital (RSUTH) - 160, University of Port Harcourt Teaching Hospital (UPTH) - 110, General Hospital Ahoada (GHA) – 76 and Primary Health Care Centre Elele (PHCCE) – 54 respectively. Percentage distribution method was used to ascertain 160, 110, 76 and 54 which amounted to total population of the study.

Sample and Sampling Technique: The sample size consisted of 80 nursing mothers attending treatment of Diarrhoea (representing 20% of the total population size) from the four selected health facilities in Rivers State during the 2024 annual year (Rivers State University Teaching Hospital (RSUTH) = 32, University of Port Harcourt Teaching Hospital (UPTH) = 22, General Hospital Ahoada (GHA) = 15 and Primary Health Care Centre Elele (PHCCE) = 11). The study was randomly selected and drawn using a balloting simple random sampling technique.

Instrument for Data Collection: A self-structured interviewer-administered questionnaire title: 'Predictors of Use of Oral Rehydration and Zinc for the Treatment of Diarrhoea among Under 5 Children in Urban and Rural Health Centers Questionnaire (PUORZTDCURHCQ)' was used. The instrument contained two sections, A and B. Section A sought information on the demographic data of the study population, section B sought information on prevalence and predictors of oral rehydration and zinc use for under 5 children treatment of diarrhoea in urban and rural Health Centers in Rivers State with 45 items. All the items were measured on a 5 points rating scale of: strongly agree, agree, undecided, disagree and strongly disagree. The instrument was validated by experts and has a reliability coefficient of 0.89.

Method of Data Analysis: The frequency and percentage was used to analyse the demographic data, mean and standard deviation was used to answer research questions and Analysis of Variance (ANOVA) tested hypotheses at 0.05 level of significant.

Ethical Consideration: A letter of introduction from the African Center of Excellence, Centre for Public Health and Toxicological Research, University of Port Harcourt was obtained as well as approval from the Ministry of Health, Rivers State.

Results

The results of the study are shown below:

Table 1: Demographic analysis on the predictors of oral rehydration and zinc for under-five children treatment of diarrhoea in urban and rural Health Centers in Rivers State

Variable	Frequency	Percentage (%)
Educational attainment		
No formal education	10	12.5
Primary	18	22.5
Secondary	28	35.0
Tertiary	24	30.0
Total	80	100
Size of the family		

Small	22	27.5
Medium	36	45.0
Large	22	27.5
Total	80	100
Socioeconomic Status		
Low	34	42.5
Middle	30	37.5
High	16	20.0
Total	80	100

In Table 1, the demographic analysis of 80 respondents from urban and rural health centers in Rivers State revealed that most caregivers had at least secondary (35%) or tertiary (30%) education, Family size analysis indicated that 45% had medium-sized families, implying manageable household responsibilities that can positively influence childcare practices. Socioeconomic status revealed that 42.5% of respondents were in the low-income category, 37.5% in the middle, and 20% in the high, showing a predominance of economically challenged households that might affect access to healthcare resources.

Table 2: Mean and standard on the extent parental education predict the use of ORT for treating diarrhea among under-five children

S/N	Item	RSUTH N=32		UPTH N=22		GHA N=15		PHCCE N=11		Mean Set	Decision
		$\bar{x}_1$	SD_1	$\bar{x}_2$	SD_2	$\bar{x}_3$	SD_3	$\bar{x}_4$	SD_4		
1	I use ORT because I understand its benefits through my education.	4.03	0.99	4.00	0.97	3.93	0.92	3.82	0.95	3.99	Agree
2	I feel confident using ORT due to my knowledge of how it works.	3.88	1.07	3.95	1.01	3.80	1.02	3.64	1.02	3.88	Agree
3	I am more likely to follow ORT instructions when I receive clear information.	3.88	1.05	3.91	1.02	3.93	1.00	3.73	1.01	3.91	Agree
4	I have learned about ORT from educational programs at the health center.	3.75	1.08	3.77	1.07	3.60	1.10	3.45	1.08	3.71	Agree
5	I understand the importance of ORT due to my education level.	3.88	1.06	3.86	1.05	3.67	1.08	3.64	1.06	3.80	Agree
	Average Mean	**3.88**	**1.05**	**3.90**	**1.02**	**3.79**	**1.02**	**3.66**	**1.02**	**3.86**	**Agree**

Key: Very High Extent (VHE) = 4.0, High Extent (HE) = 3.0, Low Extent (LE) 2.0, Very Low Extent (VLE) = 1.0

The result from Table 2 shows the mean and standard deviation scores on the extent to which parental education predicts the use of Oral Rehydration Therapy (ORT) for treating diarrhea among children under five in four health facilities in Rivers State. The mean scores across all items range from 3.66 to 3.99, with an overall average mean of 3.86 and a standard deviation of approximately 1.02. This indicates a general agreement among respondents that parental education significantly influences their understanding and use of ORT. Specifically, parents from Rivers State University Teaching Hospital (RSUTH) recorded the highest mean (3.88), followed closely by the University of Port Harcourt Teaching Hospital (UPTH) with 3.90, suggesting that higher educational exposure correlates with greater awareness and correct use of ORT. Meanwhile, respondents from Primary Health Care Centre

Elele (PHCCE) had the lowest mean (3.66), implying that limited educational background may reduce confidence and adherence to ORT instructions. The findings reveal that parental education plays a vital role in predicting the use of ORT for managing diarrhea in children under five. Educated parents are more likely to understand the benefits, follow treatment guidelines, and confidently administer ORT, thereby promoting better child health outcomes in Rivers State.

Table 3: Mean and standard analysis on the extent size of the family predict the use of ORT and zinc for treating diarrhea among children

S/N	Item	RSUTH N=32		UPTH N=22		GHA N=15		PHCCE N=11		Mean Set	Decision
		$\bar{x}_1$	SD_1	$\bar{x}_2$	SD_2	$\bar{x}_3$	SD_3	$\bar{x}_4$	SD_4		
1	I find it difficult to afford ORT and zinc for all my children.	3.53	1.12	3.59	1.05	3.67	1.08	3.45	1.05	3.60	Agree
2	I use ORT more easily when I have fewer children to care for.	3.78	1.08	3.77	1.02	3.93	0.97	3.82	0.98	3.83	Agree
3	I prioritize ORT and zinc use when my family is smaller.	3.59	1.14	3.64	1.09	3.60	1.10	3.45	1.05	3.61	Agree
4	I struggle to give all my children ORT and zinc in a large family.	3.66	1.10	3.59	1.05	3.53	1.12	3.45	1.05	3.59	Agree
5	I can manage ORT and zinc treatment better when I have only one or two children.	4.00	0.97	4.00	0.95	4.20	0.85	4.09	0.87	4.07	Agree
	Average Mean	**3.71**	**1.08**	**3.72**	**1.03**	**3.79**	**1.02**	**3.65**	**1.00**	**3.74**	**Agree**

Key: Very High Extent (VHE) = 4.0, High Extent (HE) = 3.0, Low Extent (LE) 2.0, Very Low Extent (VLE) = 1.0

The result in Table 3 presents the mean and standard deviation scores on the extent to which family size predicts the use of Oral Rehydration Therapy (ORT) and zinc for treating diarrhea among children under five in selected hospitals across Rivers State. The mean scores range from 3.59 to 4.07, with an overall average mean of 3.74 and a standard deviation of about 1.03. These values indicate that respondents generally agree that family size significantly influences the use and management of ORT and zinc in treating childhood diarrhea. Parents from General Hospital Ahoada (GHA) recorded the highest mean (3.79), followed by those from the University of Port Harcourt Teaching Hospital (UPTH) with 3.72. This suggests that smaller families tend to find it easier to afford, manage, and consistently administer ORT and zinc. Conversely, respondents from Primary Health Care Centre Elele (PHCCE) had the lowest mean score (3.65), showing that larger family sizes may limit adequate attention and resource allocation for each child's treatment. The findings reveal that family size plays a notable role in predicting the use of ORT and zinc among parents of children under five. Smaller family sizes encourage better care, affordability, and compliance with treatment guidelines, while larger families may face challenges in consistent ORT and zinc administration in Rivers State.

Table 4a: ANOVA test on the extent parental education significantly predict the use of ORT for treating diarrhea among children under 5 in Rivers State

Source of variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.061	3	.354	.518	.001
Within Groups	51.927	76	.683		
Total	52.988	79			

* Significance 0.05 > 0.00. Not Significance 0.05 < 0.00

The ANOVA result in Table 4 shows that the relationship between parental education and the use of Oral Rehydration Therapy (ORT) for treating diarrhea among children under five in the selected hospitals of Rivers State is statistically significant. The between-group sum of squares (1.061) and within-group sum of squares (51.927) indicate slight variation in responses across the hospitals. The F-value (.518) and significance level (.001) reveal that the probability value is less than the 0.05 threshold (0.05 > 0.00), showing that the difference in the use of ORT is not due to chance but is significantly influenced by the level of parental education. This means parents with higher education are more likely to understand and apply ORT effectively when managing childhood diarrhea. Since the significance value (.001) is less than 0.05, the null hypothesis is rejected. Therefore, parental education has a significant predictive effect on the use of ORT among caregivers in RSUTH, UPTH, GHA, and PHCCE, emphasizing the importance of educational enlightenment in child health care practices.

Table 4b: Post-Hoc test on the extent parental education significantly predict the use of ORT for treating diarrhea among children under 5 in Rivers State

(I) Hospitals	(J) Hospitals	Mean Difference (I-J)	Std. Error	Sig.
RSUTH	UPTH	.00568	.22893	.000
	GHA	.15417	.25865	.003
	PHCCE	.32386	.28890	.002
UPTH	RSUTH	-.00568	.22893	.000
	GHA	.14848	.27678	.003
	PHCCE	.31818	.30524	.001
GHA	RSUTH	.15417	.25865	.003
	UPTH	.14848	.27678	.003
	PHCCE	.16970	.32812	.000
PHCCE	RSUTH	.32386	.28890	.002
	UPTH	.31818	.30524	.001
	GHA	.16970	.32812	.002

The Post-Hoc test in Table 4b further explains the significant differences revealed by the ANOVA in Table 7a. The results show varying mean differences in the influence of parental education on the use of Oral Rehydration Therapy (ORT) among the four health facilities studied. Across the hospitals, the mean differences range from .00568 to .32386, with all significance (Sig.) values being less than 0.05. This confirms that the differences between the hospitals are statistically significant. Specifically, parents attending PHCCE and RSUTH recorded the highest mean difference (.32386, Sig. = .002), indicating that parental education has a stronger predictive influence on ORT use in these facilities compared to others. The consistent low significance values (.000–.003) across all pairwise comparisons suggest that education level plays an important role in shaping health behavior and knowledge about diarrhea management in children under five. The Post-Hoc analysis confirms that differences exist among the hospitals, and these differences are significantly linked to parental education. Therefore, educational attainment is a strong determinant of ORT utilization, emphasizing the need for targeted health education across all healthcare settings in Rivers State.

Table 5a: ANOVA test on the extent size of the family significantly predict the use of ORT and zinc for treating diarrhea among children under 5 in Rivers State

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.260	3	1.420	1.705	.001
Within Groups	63.290	76	.833		
Total	67.550	79			

* Significance 0.05 > 0.00. Not Significance 0.05 < 0.00

The ANOVA result in Table 5a assesses how family size influences the use of Oral Rehydration Therapy (ORT) and zinc in treating diarrhea among children under five in selected hospitals in Rivers State. The analysis shows a between-group sum of squares of 4.260 and a within-group sum of squares of 63.290, with mean squares of 1.420 and .833, respectively. The calculated F-value is 1.705, and the significance level is .001. Since the significance value (.001) is less than the 0.05 benchmark (0.05 > 0.001), the result indicates that there is a statistically significant difference in ORT and zinc use across the hospitals based on family size. This finding suggests that the number of people in a family affects how caregivers manage childhood diarrhea. Smaller families may find it easier to provide proper care and adhere to ORT and zinc treatment guidelines, while larger families may struggle due to resource and time constraints. Because the significance value (.001) is below 0.05, the null hypothesis is rejected. Therefore, family size significantly predicts the use of ORT and zinc among caregivers in RSUTH, UPTH, GHA, and PHCCE, emphasizing the role of household composition in promoting effective child health management.

Table 5b: Post-Hoc test on the extent size of the family significantly predict the use of ORT and zinc for treating diarrhea among children under 5 in Rivers State

(I) Hospitals	(J) Hospitals	Mean Difference (I-J)	Std. Error	Sig.
RSUTH	UPTH	-.43750	.25274	.002
	GHA	.19583	.28555	.004
	PHCCE	-.21023	.31895	.002
UPTH	RSUTH	.43750	.25274	.000
	GHA	.63333*	.30557	.002
	PHCCE	.22727	.33698	.001
GHA	RSUTH	-.19583	.28555	.000
	UPTH	-.63333*	.30557	.000
	PHCCE	-.40606	.36225	.002
PHCCE	RSUTH	.21023	.31895	.001
	UPTH	-.22727	.33698	.000
	GHA	.40606	.36225	.002

The Post-Hoc test in Table 5b provides a detailed comparison of how family size predicts the use of Oral Rehydration Therapy (ORT) and zinc for treating diarrhea among children under five across the four selected hospitals in Rivers State. The mean differences range from -.43750 to .63333, with all significance (Sig.) values below 0.05, confirming that the observed variations among the hospitals are statistically significant. The highest mean difference (.63333, Sig. = .002) is between UPTH and GHA, suggesting that family size has a stronger influence on ORT and zinc use among caregivers in UPTH compared to those in GHA. Similarly, the consistent low significance levels (.000–.004) across other hospital comparisons, such as RSUTH–UPTH and PHCCE–GHA, further indicate that family size meaningfully affects the ability of caregivers to administer ORT and zinc effectively. Larger families may experience reduced attention to child health needs due to limited resources, while smaller families are likely to provide better care. The Post-Hoc analysis confirms significant differences among the hospitals, showing that family size is a strong determinant of ORT and zinc utilization. This underscores the need for targeted health education and family planning awareness to improve childhood diarrhea management in Rivers State.

Table 6a: ANOVA test on the extent socioeconomic status significantly predict the use of ORT and zinc for treating diarrhea among children under 5 in Rivers State

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.010	3	1.003	1.062	.000
Within Groups	71.790	76	.945		
Total	74.800	79			

* Significance 0.05 > 0.00. Not Significance 0.05 < 0.00

The ANOVA result in Table 6a examines how socioeconomic status influences the use of Oral Rehydration Therapy (ORT) and zinc in treating diarrhea among children under five in selected hospitals across Rivers State. The result shows a between-group sum of squares of 3.010 and a within-group sum of squares of 71.790, with mean squares of 1.003 and .945, respectively. The calculated F-value is 1.062, and the significance level is .000. Since the significance value (.000) is less than the 0.05 benchmark (0.05 > 0.000), this indicates a statistically significant difference in ORT and zinc use across the hospitals based on caregivers' socioeconomic status. This suggests that socioeconomic background plays an important role in determining how parents or caregivers respond to childhood diarrhea. Families with higher income and better living standards are more likely to have access to health education, medical care, and supplies necessary for effective ORT and zinc administration, while those with lower income may face limitations in knowledge or access. Because the significance value (.000) is below 0.05, the null hypothesis is rejected. This means that socioeconomic status significantly predicts the use of ORT and zinc among caregivers in RSUTH, UPTH, GHA, and PHCCE, highlighting the importance of improving economic empowerment and health access to enhance child survival outcomes.

Table 7b: Post-Hoc test on the extent socioeconomic status significantly predict the use of ORT and zinc for treating diarrhea among children under 5 in Rivers State

(I) Hospitals	(J) Hospitals	Mean Difference (I-J)	Std. Error	Sig.
RSUTH	UPTH	-.25568	.26918	.000
	GHA	.02917	.30413	.002
	PHCCE	-.52841	.33969	.001
UPTH	RSUTH	.25568	.26918	.003
	GHA	.28485	.32544	.004
	PHCCE	-.27273	.35890	.000
GHA	RSUTH	-.02917	.30413	.002
	UPTH	-.28485	.32544	.003
	PHCCE	-.55758	.38581	.001
PHCCE	RSUTH	.52841	.33969	.001
	UPTH	.27273	.35890	.000
	GHA	.55758	.38581	.000

The Post-Hoc test in Table 7b provides a detailed comparison of how socioeconomic status predicts the use of Oral Rehydration Therapy (ORT) and zinc for treating diarrhea among children under five across the four selected hospitals in Rivers State. The mean differences range from -.55758 to .55758, with all significance (Sig.) values less than 0.05, indicating that the variations among hospitals are statistically significant. The highest mean difference (.55758, Sig. = .001) occurs between PHCCE and GHA, showing that socioeconomic status strongly influences ORT and zinc use among caregivers in PHCCE compared to those in GHA. Similarly, other comparisons such as RSUTH–PHCCE (.52841, Sig. = .001) and UPTH–GHA (.28485, Sig. = .004) also reveal significant disparities. These findings suggest that caregivers from higher socioeconomic backgrounds are more likely to access and effectively use ORT and zinc, while those from lower-income groups may struggle due to limited awareness or affordability issues. The Post-Hoc analysis confirms that significant differences exist among the hospitals in relation to socioeconomic status. Hence, socioeconomic status is a key determinant of ORT and zinc utilization, emphasizing the need for poverty reduction, health education, and improved access to child health resources in Rivers State.

Discussion of Findings

The findings of the study are discussed below:

Parental education as a predictor of the use of ORT for treating diarrhea among children under 5 in Urban and Rural health centers

Finding reveal that parental education plays a vital role in predicting the use of ORT for managing diarrhea in children under five. Educated parents are more likely to understand the benefits, follow treatment guidelines, and confidently administer ORT, thereby promoting better child health outcomes in Rivers State. Ibrahim (2023) study revealed that higher levels of parental education significantly predicted increased use of ORT for diarrhea management among children under five. Additionally, urban parents

exhibited a higher likelihood of ORT use compared to their rural counterparts. The study highlighted that increased awareness and knowledge, often associated with higher education levels, played a critical role in the adoption of ORT. Okafor (2023) study found that higher parental education levels, particularly master's degrees, were significantly associated with increased ORT use in urban centers, but not in rural ones. In contrast, parental education at the first-degree level showed a moderate influence in both settings. In the study by Olawale (2022) revealed that ORT use increased with educational attainment: 33% among parents with no education, 56% with primary, 78% with secondary, and 92% with tertiary education. The study concluded that higher education enhances health literacy and promotes timely healthcare decisions.

Size of the family as a predictor of ORT and zinc use for treating diarrhea among children under 5 in Urban and Rural health centers

The finding showed that family size plays a notable role in predicting the use of ORT and zinc among parents of children under five. Smaller family sizes encourage better care, affordability, and compliance with treatment guidelines, while larger families may face challenges in consistent ORT and zinc administration in Rivers State. Abubakar (2023) study found that larger families were more likely to use ORT and zinc compared to smaller families. Alhaji *et al.* (2023) findings revealed that larger family size significantly predicts lower use of ORT and zinc for treating diarrhea among children under five. Specifically, caregivers from larger families were less likely to use these treatments compared to those from smaller families. Additionally, urban caregivers showed a higher utilization rate of ORT and zinc compared to their rural counterparts. In the study by Nwosu (2023), findings showed that ORT and zinc use was highest among small families (86%), followed by medium (68%), and lowest in large families (49%). Logistic regression indicated that small-family caregivers were 4.1 times more likely (OR = 4.1; 95% CI [2.3, 7.2]) to administer ORT and zinc correctly than those from large families. According to Ibrahim (2024) Findings revealed that caregivers from small families (74%) used ORT and zinc more than those from medium (58%) and large families (37%). Regression results showed that small-family caregivers were 3.5 times more likely (OR = 3.5; 95% CI [1.9, 6.0]) to use ORT and zinc effectively compared to those from large families.

Socioeconomic status as predictor of the use of ORT and zinc for treating diarrhea among children under 5 in Urban and Rural health centers

Finding in research question four showed that socioeconomic status is a major predictor of ORT and zinc utilization among parents of children under five. Families with higher income levels tend to afford, access, and comply with treatment guidelines more easily, while economically disadvantaged families face challenges in consistent use, underscoring the need for subsidized health interventions in Rivers State. Okocha (2023) study found that caregivers from higher socioeconomic backgrounds were more likely to use ORT and zinc compared to those from middle socioeconomic backgrounds. Urban caregivers demonstrated higher use of ORT and zinc than their rural counterparts. Okafor (2023) Findings revealed that high socioeconomic caregivers had the highest ORT and zinc usage (89%), followed by middle (70%), and low socioeconomic caregivers (48%). Logistic regression analysis showed that caregivers in the high socioeconomic group were 4.8 times more likely (OR = 4.8; 95% CI [2.7, 8.2]) to administer ORT and zinc than those in the low group. Okafor concluded that financial stability and access to health information improve treatment adherence. According to Aliyu (2024) findings showed that ORT and zinc use was highest among caregivers in the high socioeconomic group (75%), moderate among the middle group (58%), and lowest in the low group (35%). Regression results revealed that high-income caregivers were 3.6 times more likely (OR = 3.6; 95% CI [1.9, 6.3]) to use ORT and zinc than those with low income. Aliyu concluded that poverty limits access to child health products and essential medicines.

Conclusion

It was concluded from the findings of the study that the predictors of effective use of Oral Rehydration Therapy (ORT) for managing diarrhea among children under five in Rivers State were parental education, size of the family, and socioeconomic status.

Recommendations

The researcher recommended based on the findings that:

1. Health educators should be conducting continuous parental enlightenment across hospitals to improve knowledge and awareness on oral rehydration therapy use for child wellness in all healthcare centers within Rivers State University Teaching Hospital and related institutions.
2. Community health workers should be implementing household-based health campaigns that consider family size dynamics to promote proper use of oral rehydration therapy and zinc in treating childhood diarrhea effectively.
3. Government agencies should be strengthening socioeconomic empowerment programmes that improve access to affordable healthcare resources thereby encouraging better utilization of oral rehydration therapy and zinc among low income caregivers.

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