

**Effectiveness of Who Combination Treatment Regimen in The Management of Diarrhoea Among Under-Five Children Attending Primary Health Care Centres in Oyo State, Nigeria**

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**ABSTRACT:** *Diarrhoea is one of the childhood diseases that result to high mortality. Despite the World Health Organization (WHO) recommendation of the combination treatment regimen of oral rehydration salts (ORS) and zinc supplements for the management of this disease, its effectiveness in treating and preventing the reoccurrence of diarrhoea among the under-five children remains a serious concern. Therefore, the main objective of this study was to assess the effectiveness of WHO combination treatment regimen in the management of diarrhoea amongst under-five children attending Primary Health Care (PHC) centres in Oyo State. The study adopted quasi-experimental of one group Pretest-posttest design. Purposive sampling technique was used to recruit a total of 60 eligible participants on admission. The effectiveness of the combination treatment regimen was assessed based on the recovery rate of the participants at 24 hours, 2 weeks and 4 weeks post intervention using a standardized instrument of WHO observational check-list for assessing diarrhoeaic under-five children. Data analysis was done using both descriptive and inferential statistics. However, on admission (baseline), majority 52(86.7%) of the participants had moderate diarrhoea. After administering WHO-ORS plus Zinc supplements, 24 hours later, majority 51(85.0%) of the participants had no diarrhoea, two (2) weeks later, during home visiting, majority 56(93.3%) of the participants had no diarrhoea. After Four (4) weeks, significant improvement was also achieved as 57(95.0%) participants had no diarrhoea. It was concluded that the significant improvement in the diarrhoea status in 24 hours, 2 weeks and 4 weeks post intervention was an indication that the combination of WHO-ORS plus zinc suggest how highly efficacious the regimen is in the management of under-five diarrhoea. Hence, Health workers in the PHC should combine the therapy and not using only one in the management of under-five diarrhoea.*

**KEYWORDS:** effectiveness, combination treatment regimen, zinc, ORS, diarrhoea, under-five

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## INTRODUCTION

Diarrhoea is one of the childhood diseases that result to high mortality. Despite the World Health Organization prescription of the combination treatment regimen for the management of this disease, the use of this regimen by the nurses in primary health care centres in Oyo state and how effective the regimen is in treating and preventing the reoccurrence of under-five diarrhoea disease needed to be researched into. This regimen is the combination of oral rehydration salts (ORS) and zinc supplements. It is a low-cost and effective solution to treat childhood diarrhoea because it both reduces diarrhoea episode symptom severity, duration, and prevents subsequent episodes from occurring and it is one of the significant medical innovations of the twenty first century (UNICEF, 2022).

Globally, there are nearly 1.7 billion cases of childhood diarrhoea disease annually with an estimated 525,000 under-five children dying annually of the disease (WHO, 2017; UNICEF, 2022). According to WHO (2017), an estimated 56 per cent of children suffering from diarrhoea do not receive treatment with ORS, and 93 per cent of children do not receive zinc. Of those that do receive ORS and zinc treatment, the guideline is not accurately followed. Specifically in Africa, the use of the prescribed combination of ORS and zinc to treat diarrhoea still remain considerably low with less than 40% of children with diarrhoea receiving the recommended treatment regimen (Kassa et al., 2022). In sub-Saharan Africa, progress on this important intervention has been slow over the last decade with coverage at 31 per cent in 2011 and 36 per cent in 2021. However previous studies have showed that the combination of ORS and zinc can help to reduce morbidity and mortality of under-five children (UNICEF, 2021).

Diarrhoea diseases collectively constitute a serious public health challenge globally, especially as the leading cause of death in children (after respiratory diseases). Childhood diarrhoea affecting children under the age of five accounts for approximately 63% of the global burden. Accurate and timely detection of the aetiology of these diseases is very crucial; but conventional methods, apart from being laborious and time-consuming, often fail to identify difficult-to-culture pathogens. The aetiological agent of an average of up to 40% of cases of diarrhoea cannot be identified (Troeger, et al., 2016).

Diarrhoea among children is defined as a disease with loose or watery stool three or more times within a day, or a decrease in the consistency of the stool from that which is normal for the patient (Manetu et al., 2021). Though most episodes of childhood diarrhoea are not always severe, acute cases can lead to significant fluid loss and dehydration. Consequently, deaths or other severe consequences can arise if fluids are not replaced at the first sign of diarrhoea. Diarrhoea is a disease caused by a wide range of pathogens, including, viruses, protozoa and bacteria (Manetu et al., 2021). There are several most life-threatening viral and bacteria pathogens affecting individuals in developing countries among them is rotavirus which is the leading cause of acute diarrhoea, and is responsible for about 40 per cent of all hospital admissions due to diarrhoea among children under five worldwide (WHO, 2017).

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According to World Health Organization (2017), for the purpose of optimal case management and of epidemiological tracking, a diarrhoea episode is often diagnosed according to symptoms and is classified into three categories: Acute watery diarrhoea including cholera is associated with significant fluid loss and rapid dehydration in an infected individual. It usually lasts for several hours or days. The pathogens that generally lead to acute watery diarrhoea include *V. cholerae* or *E. coli* bacteria, as well as rotavirus. Bloody diarrhoea, often referred to as dysentery, is marked by visible blood in the stools. It is associated with intestinal damage and nutrient losses in an infected individual. The most common cause of bloody diarrhoea is *Shigella*, a bacterial agent that is also the most common cause of severe cases and persistent diarrhoea is an episode of diarrhoea, with or without blood that lasts at least 14 days. Undernourished children and persons with other illnesses such as AIDS, are more likely to develop persistent diarrhoea, which in turn, tends to worsen their condition (Manetu et al., 2021).

In line with the submission of UNICEF (2021), diarrhoea remains the leading killer of children, accounting for approximately 8 per cent of all deaths among children under age 5 worldwide in 2017. This translates to over 1,400 young children dying each day, or about 525,000 children a year, despite the availability of a simple treatment solution. Also, diarrhoea is responsible for more than 90% of death among under 5 children in low and middle income countries of the world out of which regionally South Asia and Sub-Saharan Africa accounted for 88% of this death. (Demissie et al, 2021). Study has shown that nearly one in every five child deaths and about 1.6 million death each year, are due to diarrhoea. Unfortunately, diarrhoea accounts for significant death figure of young children than malaria, measles and Acquired Immunodeficiency Syndrome (AIDS) combined (Manetu et al., 2021).

Availability and accessibility of WHO-ORS and zinc regimen to all children with diarrhoea especially those in poor, rural and marginalized populations tend to be inadequate. However where it is available and accessible, it was noted to have saved the lives of hundreds of thousands of additional children each year. These interventions have proven to be cost-effective, affordable and relatively straight forward to implement. Unfortunately, the number of children under age 5 with diarrhoea who receive the recommended treatment of oral rehydration solution is too low across regions (UNICEF, 2022).

Similarly, in Africa, it was estimated that every child has five episodes of diarrhoea per year and that 800,000 children die each year from diarrhoea and dehydration. This has made diarrhoea the second biggest killer of children in Nigeria alone, with about 16% of child's death every year. In all, an estimated 151,700 children die in Nigeria every year from diarrhoea disease (Dairo et al., 2017). Furthermore, there is regional variation in the distribution of diarrhoea in Nigeria. A national study conducted in Nigeria by Jiwok et al., (2021) shows a higher (37.7%) prevalence of the diarrhoea disease among infants in the northern part of Nigeria compared to the southern part of (21.1%).

In a bid to reduce mortality from under-five diarrhoea in Nigeria, the Clinton Health Access Initiative, International. (CHAI) and the Government of Nigeria implemented a comprehensive program in eight states between 2012 and 2017. The program uses the WHO standard treatment of combining Zinc and ORS in combating the episode of diarrhoea. In addition, the program

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addressed demand, supply and policy barriers to ORS and Zinc uptake through intervention in both public and private sectors. The intervention includes: (1) policy revision and partner coordination; (2) market shaping to improve availability of affordable, high-quality ORS and zinc; (3) provider training and mentoring; and (4) caregiver demand generation (Lam et al., 2019). Meanwhile, across all the eight states of Nigeria where the CHAI-supported program was initiated, the average ORS coverage across the program areas increased from 35% to 48% and combined ORS and zinc coverage increased from 1% to 24% (Schroder et al., 2019).

In 2017, diarrhoea was among the leading cause of death among all ages globally (more than 1.7 million deaths) and the fifth leading cause of death among children younger than five years with more than 0.44 million deaths) (Troeger et al, 2018). According to the World Health Organization (WHO) 2017 report, more than a quarter (26.9%) of diarrhoea deaths occurred among children younger than five years, and about 90% of diarrhoea deaths occurred in South Asia and sub-Saharan Africa (WHO, 2021). Gill et al., (2017) reported that diarrhoea disease is the 9th leading cause of death globally but 4th among children under-5 years. The ranks were 8th and 5th respectively in a Global Burden of Disease (GBD) study (GBD, 2016). About nine of every annual global diarrhoea-related deaths among under-five children occurs in Sub-Saharan Africa and South Asia (Kotloff, 2017). Worse still, the survivors of diarrhoea are faced with a long-time higher risk of growth faltering, ill health, stunting, and cognitive impairment, It is worth noting that improvements in the standard of living, advances in sanitation, water treatment and food safety awareness have brought about a reduction in the total global deaths due to diarrhoea, the morbidity from diarrhoea have remained exceptionally high and has accounted for substantial economic and societal losses (Mokomane et al., 2018).

There is an unequal geographical distribution of diarrhoea burden among children younger than five years of age across Africa. Children in low- and middle-income countries (LMICs) are the most vulnerable to diarrhoea. More than half of all the diarrhoea related deaths among children in Africa were estimated to occur in 7.0% of the first-level administrative subdivisions (i.e., states, regions or provinces depending on the country) on the continent (Reiner et al, 2018). Diarrhoea was noted to be closely associated with environmental and socio-economic conditions, with the impoverished communities being most affected in a study conducted on Prevalence of diarrhoea and risk factors among children under five years old in Mbour, Senegal by Thiam et al., (2017). In 2016, over 75% (101/133) of diseases or disease groups listed in the Global Health Observatory had significant links with the environment, and more than one-quarter of the 6.6 million under-five child deaths were associated with environment-related causes and conditions. Among diseases contributing to the environmental burden of diseases, diarrhoea diseases count for 22% and parasitic and vector-borne diseases for 12% (WHO, 2021). In 2019, diarrhoea was documented to be the leading killer of children, accounting for approximately 9 percent of all deaths among children under age 5 worldwide. This translates to over 1,300 young children under five dying each day, or about 484,000 children a year, despite the availability of a simple treatment solution like the use of oral rehydration therapy (ORS) and zinc supplements (Oyewumi, 2022).

Additionally, in a cross sectional study in Cape Town, South Africa by Nguyen et al, (2021) on diarrhoea among children aged under-five years and risk factors in informal settlements it was opined that informal settlements in Africa are synonymous with public health challenges as a result

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of dense population and poor sanitation. The urban population growth rates in Africa are the highest in the world, and it has been projected that by 2050, Africa's cities will be home to an estimated 950 million people (OECD, 2021).

Many of these informal settlements are located on low-lying, flood-prone areas or steep slopes with poor water and sanitation services. Generally, those informal settlements are characterized by dense populations, unhygienic conditions, improper disposal of waste, and poor sanitation. With such living conditions, citizens who live in those areas are particularly vulnerable to diarrhoea. Additionally, a lack of access to potable water supplies, contamination risks associated with the water sources, poor sanitation, poor drainage, presence of contaminated grey water, and inadequate stormwater management, among other factors, may increase the risks for diarrhoea especially for children under five (Nguyen et al, 2021).

Saha et al., (2022) in a survey carried out in rural Indian submitted that diarrhoea was less likely to develop among children aged 12–23 months (AOR: 0.928, 95% CI (0.876, 0.983)), 24–35 months (AOR: 0.579, 95% CI (0.54, 0.617)), 36–47 months (AOR: 0.394, 95% CI (0.367, 0.424)), and 49–59 months (AOR: 0.313, 95% CI (0.289, 0.339)) compared to children aged 0–11 months. Diarrhoea disease was 0.897 times less likely to prevail among female children (AOR: 0.897, 95% CI (0.859, 0.937)). The odds of emergent diarrhoea were 1.135 times higher among children with low birth weight (AOR: 1.135, 95% CI (1.074, 1.201)) than those with normal birth weight. The odds of developing diarrhoea were 1.097 times higher among undernourished children (AOR: 1.097, 95% CI (1.047, 1.149)) than well-nourished children. Diarrhoea occurred more among children whose mothers had higher birth order (4+) (COR: 1.086, 95% CI (1.038, 1.136)) compared to first-birth-order children and was more likely to occur among those children who were currently breastfeeding (COR: 1.409, 95% CI (1.360, 1.461)).

Moreso, Nigeria Demographic and Health Survey (NDHS) (2018) documented that diarrhoea was most common among children aged 12–23 months and least common among those aged 48–59 months. Kenya Demographic and Health Survey (KDHS) showed that the prevalence of diarrhoea is highest in children aged between 6 and 11 months, followed closely by children between the ages of 12 and 23 months (Kenya DHS, 2014).

In a study carried out in Imo State, Nigeria, nurses working at Primary Health Care centres in the state demonstrated moderate level of knowledge on the use of ORS and zinc, although there still remained identifiable knowledge gaps on key factors underlying the use of the recommended ORS and zinc (Ogugua & Chiejina, 2021). However, there is paucity of data on the awareness and success rate of the use of WHO combination regimen of ORS/Zinc for managing diarrhoea cases among under-five children in Primary Health Care Centers in Oyo State, Nigeria. Following the WHO recommended guideline, will in no measure reduce the occurrence and the mortality resulting from diarrhoea disease. The situation in Primary Health Centers in Oyo State where these treatment are most time not being used or even when used are haphazardly used calls for an immediate intervention (WHO, 2020; UNICEF, 2022). This study intends to assess the effectiveness of WHO combination treatment regimen in the management of diarrhoea amongst under-five children attending primary health care centres in Oyo State.

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The main objective of this study is to assess the effectiveness of WHO combination treatment regimen in the management of diarrhoea amongst under-five children attending primary health care centres in Oyo State, Nigeria. The specific objectives are to:

1. assess the baseline data of diarrhoea status among the under-five children who reported at the selected primary health care centres pre intervention;
2. assess the clinical diarrhoea status of under-five children in 24hours, 2 weeks and 4 weeks at the selected Primary Health Care Centres post intervention and

### **Research Questions**

1. What is the baseline data of diarrhoea among the under-five children who reported at the selected primary health care centres in Oyo State, Nigeria?
2. What is the clinical diarrhoea status of under-five children in 24hours, 2 weeks and 4 weeks at the selected primary health care centres in Oyo State, Nigeria?

### **Hypothesis**

- H<sub>0</sub>1. There is no significant difference between the baseline diarrhoea status and the post intervention diarrhoea status of under-five children at the selected primary health care centre in Oyo State, Nigeria.

### **METHODOLOGY**

The study adopted quasi-experimental of one group pretest-posttest design to assess the effectiveness of WHO combination treatment regimen of ORS with zinc supplement in the management of diarrhoea amongst under-five children attending selected primary health care centres in Oyo State, Nigeria. The design was used to assess clinical diarrhoea status of the under-five children as baseline information using WHO clinical observation checklist. Thereafter, there was introduction of the WHO combination treatment regimen for the management of under-five diarrhoea disease and evaluation of the effectiveness of WHO-ORS with zinc supplement on diarrhoea and dehydration status of the under-five children after 24 hours prior discharge home. The same instrument (baseline information) was used two and four weeks post-intervention during home visiting to understudy the effectiveness of the combination regimen.

The study focused on under-five children at the selected primary health centres in Oyo State, Nigeria i.e., Ogbomoso South, Surulere and Orire Local Government Areas who reported for diarrhoea disease during the period of the study which were 222. Pilot study was done in a PHC in Ogbomoso North Local Government. The PHC were selected based on the number of under-five diarrhoea cases that reports at the centres. Jabata Primary Health care centre in Orire LGA has an average of 72 cases, Kajola in Ogbomoso South records an average of 61 cases while Ikoyi Ile PHC documented an average of 67 cases per month. The sample size was calculated using proportion formula which yielded 60 respondents.

Only the under-five children who reported for diarrhoea disease treatment at the selected primary health care centres during the study period and met the eligibility criteria were recruited for the study using purposive sampling technique. To ascertain the base line data of the participants, a

Publication of the European Centre for Research Training and Development -UK structured questionnaire adopted from WHO observational check list for the management of diarrhea among under-five children was administered.

A standardized WHO clinical observation checklist for the management of under-five diarrhoea was used for this study and it was divided into two sections. It consists of socio-demographic profile. Section B consisted of diarrhoea observational check list that was used to assess diarrhoea status. The tool has 8 items in it. Which are color, consistency, odour, blood, mucus, duration, and pain. Each item were scored between 1, 2 and 3. In diarrhoea stool assessment tool, one refers to mild changes in stool, two refer to moderate changes in stool and three refers to the severe changes in stool. Score between 1-8 falls under no diarrhoea, between 9-16 is categorized as moderate diarrhoea and 17-24 is categorized as severe diarrhoea.

The reliability of the instrument was established using inter -rater method based on the pilot study data obtained from Oja Igbo PHC in Ogbomoso North Local Government Area. The reliability of the instrument on diarrhoea status was found  $r = 0.89$ . The tool was found to have high inter-rater reliability.

The study participant's parents gave informed consent. The data collection period was four weeks. The participants were selected according to the criteria laid down, every day at each of the PHC centers with the help of the trained research assistants. Every week an average of 9-12 patients were selected for each of the primary health care centres. Confidentiality of the data collected were maintained.

The effectiveness of the combination treatment regimen was assessed based on the recovery rate of the participants at 24 hours, 2 weeks and 4 weeks post intervention using a structured questionnaire directed to the mother/caregivers. For quality control purposes, each completed questionnaire was checked for completeness. Data were keyed in to the computer using SPSS Version 25 program. To assess the baseline data of diarrhoea status of the under-five children, both descriptive and inferential statistics was used to analysed the data. For the assessment of both the clinical diarrhea status of the under-five children in 24 hours, 2 weeks and 4 weeks, Percentage and frequency distribution table was used for it analysis.

## RESULTS

**Research Question 1:** What is the baseline data of diarrhoea among the participants who reported at the selected primary health care centres in Oyo State?

**Table 1: Frequency and percentage distribution of participants' diarrhoea status**

Diarrhoea	Baseline	
	Freq.	%
<b>Diarrhoea status</b>		
No diarrhoea	6	10.0
Moderate	52	86.7
Severe	2	3.3

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Table 1 shows that on admission (baseline), majority 52(86.7%) of the participants presented with moderate diarrhoea while 6(10.0%) and 2(3.3%) had mild and severe diarrhoea respectively.

**Research Question 2:** What is the clinical diarrhoea status of the participants in 24 hours, 2 weeks and 4 weeks at the selected primary health care centres in Oyo State?

**Table 2: Participants diarrhoea status in 24 hours, 2 weeks and 4 weeks**

Diarrhoea	24 hours		2 weeks		4 weeks	
	Freq.	%	Freq.	%	Freq.	%
<b>Diarrhoea status</b>						
No diarrhoea	51	85.0	56	93.3	57	95.0
Moderate diarrhoea	9	15.0	4	6.7	3	5.0
Severe diarrhoea	-	-	-	-	-	-

Table 2 shows that after introduction of WHO-ORS + Zinc regimen, majority 51(85.0%) of the participants in 24 hours had no diarrhoea while only 9(15.0%) had moderate diarrhoea. Two (2) weeks later, the numbers of the participants with no diarrhoea had increased to 56(93.3%) while those with moderate diarrhoea had decline to 4(6.7%) moderate diarrhoea. Meanwhile, after four (4) weeks, an improvement was achieved as 57(95.0%) of the participants had no diarrhoea, and 3(5.0%) had moderate diarrhoea.

### Hypothesis Testing

**H<sub>01</sub>:** There is no significant difference between the baseline diarrhoea status and the post intervention diarrhoea status of the participants at the selected Primary Health Care Centres in Oyo State

**Table 3: Paired sample comparison of mean diarrhoea score among participants before and after administration of WHO-ORS with zinc**

Pairs	Measurement	N	Mean difference	S.D	Paired samples correlations	t-value	Sig.
1	On admission & 24 hours	60	5.08333	2.6572	.239	14.818	.000
2	On admission & 2 weeks	60	4.36667	2.4144	.418*	14.009	.000
3	On admission & 4 weeks	60	5.18333	2.6712	.208	15.031	.000

\* Significant at 0.05 level



From the Table 3, since the t-value of 14.818, 14.009 and 15.031 were computed at 0.05 level of significant, a higher score between the baseline diarrhoea status and 24 hours, 2 weeks and 4 weeks diarrhoea status indicates that there is significant difference between the baseline diarrhoea status and the post intervention diarrhoea status of the participants. Hence the hypothesis was rejected.

## DISCUSSION OF FINDINGS

The finding of this study shows that on admission (baseline), majority 52(86.7%) of the participants had moderate diarrhoea whereas only 6(10.0%) participants had mild diarrhoea and 2(3.3%) had severe diarrhoea. After administering WHO-ORS plus Zinc supplements, 24 hours later, majority 51(85.0%) of the participants had no diarrhoea, 9(15.0%) had moderate diarrhoea and none of the participants had severe diarrhoea, Two (2) weeks later, during home visiting, majority 56(93.3%) of the participants had no diarrhoea and 4(6.7%) had moderate diarrhoea. After Four (4) weeks, significant improvement was also achieved as 57(95.0%) participants had no diarrhoea, and only 3(5.0%) had moderate diarrhoea. The reason for the 3(5.0%) of the participants that were still having moderate diarrhoea may not be unconnected to their source of water and many people using the same pit latrine and probably because their level of education was very low. Again, It could be deduced from this findings that the effectiveness of this combination treatment regimen as exemplified by the significant reduction in the number of diarrhoea cases among the under-five children is an indication that combining ORS plus zinc is highly effective in the management of under-five diarrhoea cases and its use should be encouraged at the primary health care centres in order to reduce significantly death resulting from diarrhoea disease.

The above findings on participant diarrhoea status on admission, 24 hours, 2 weeks and 4 weeks at the selected primary health care centres in Oyo state, Nigeria corroborated the submission of the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) on combine effect of ORS and Zinc where they affirmed that combining ORS with Zinc in the management of under-five diarrhoea reduces diarrhoea deaths significantly and reduces the duration, severity, and recurrence of diarrhoea diseases in children in the 2 to 3 months of treatment (Mohamed et al, 2020). Also, Mazumder et al, (2019) alluded to the benefits of WHO ORS plus Zinc combination to include reductions in the incidence or severity of episodes of diarrhoea in subsequent months, noting that the effect of the intervention in young infants was substantial and of public health importance. In addition Kassa et al, (2022) opined that studies showed that the co-utilization of ORS and zinc can help to reduce morbidity and mortality of children. Moreover, WHO, (2022) in her global observatory health report submitted that recent studies suggest that administration of zinc along with ORS can reduce the duration and severity of diarrhoea episodes for up to three months.

Moreover, the findings of this present study showed there was a significant difference between the baseline diarrhoea status and the post intervention diarrhoea status among the participants since the mean diarrhoea score after administration of WHO-ORS with zinc was lower than the baseline (On admission) score. This indicates that the difference in mean scores is an improvement of diarrhoea status of the under-five children, therefore, the null hypothesis was rejected.

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The above finding is in tandem with the submission of UNICEF, (2022) which states that combining ORS and Zinc reduce symptoms, severity and duration as well as the risk of recurrence in the short-term and could prevent an estimated 525,000 under-five children from dying of the disease each year. Also, WHO, (2019) recommended that Zinc is an essential nutrient that becomes depleted during diarrhoea episodes, when given as a supplement, it reduces the duration and severity of illness and even helps prevent future episodes. Invariably, when ORS and zinc team up together, diarrhoea does not stand a chance. Zinc, when combined with ORS, reduces the duration and intensity of diarrhoea, as well as the frequency of diarrhoea over the next 2–3 months (Kassa et al, 2022).

## CONCLUSION

The study concluded that most under-five children are affected with diarrhoea disease and should be properly attended to. Following the administration of WHO-ORS with Zinc, the level of diarrhoea status improved tremendously in 24hours, 2 weeks and 4 weeks. The combination regimen of WHO-ORS with zinc was found effective in managing diarrhoea among under-five children.

## Recommendations

The findings of the study will help the nurses in the following ways.

1. Early identification and prevention of diarrhoea among the under-five children should be encouraged.
2. As WHO-ORS with zinc is less expensive and has no adverse effects, nurses should readily use it.
3. Nurses should assess the children with diarrhoea by using observational checklist to detect diarrhoea status and treat accordingly.
4. Nursing personnel should include this nursing intervention in the management of diarrhoea among under-five children.
5. Routine practice of using WHO-ORS with zinc in the management of diarrhoea among under-five children should be encouraged among the nurses.

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