



**Assessment of mothers' knowledge about
management of diarrhea disease among under-
five children in two districts of Jos South lga,
Plateau state**

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Abstract

Diarrhea is the passage of unusually loose or watery stool usually at least three times in a 24 hour period. However, it is the consistency of the stools rather than the number that is most important. Frequent passing of formed stools is not diarrhea. This study was to assess mothers' knowledge about management of diarrhea disease among under-five children in two districts of Jos South L.G.A, Plateau State. A total of 420 consented mothers from different households and hospitals were enrolled. A structured questionnaire was issued to mothers that was later collated and analyzed using chi-square test. A total of 152(36.2%) of mothers have full knowledge about causes, symptoms and prevention of diarrhea disease, 247(58.8%) have partial knowledge while 21(5.0%) have no knowledge at all. Two hundred and sixteen (51.4%) have full knowledge about prevention and management strategies, 177(42.1%) with partial knowledge while 27(6.5%) have no knowledge at all on prevention and management strategies for diarrhea disease among under-five children. The finding of this study shows that most mothers have partial knowledge on management of diarrhea disease among under-five children. Early identification and management of diarrhea at home is essential in preventing diarrhea related mortality and morbidity before presenting such a child to the hospital. Health care providers, State and Local government authorities that regulate health should provide programmes that will improve mothers' knowledge on recognition and home management of diarrhea disease among under-five children before hospital presentation to reduce/ eliminate diarrhea related deaths among under-five children.

Keywords: Mother's knowledge, diarrhea disease, under-five children, districts, Jos south, management

Introduction

Diarrhea is the passage of three or more loose or liquid stools per day. It can also be defined as the passage of more frequent semi-formed or watery stools than is normal for an individual (Momoh et al., 2022). Diarrhea is a preventable and treatable disease, but it is a leading cause of death among under-five children globally (Akpan & Ijezie, 2018). Diarrhea can be prevented by adopting the WHO acronym "WASH," which means Water, Sanitation, and Hygiene. Diarrhea should be treated with oral rehydration solution (ORS), a solution of clean water, sugar, and salt. In addition to the ORS, dispersible zinc tablets administered over a period of 10-14 days can shorten the duration of diarrhea and improve management outcomes (WHO, 2024).

Diarrhea is usually a symptom of an infection in the intestinal tract which can be as a result of contaminations by either bacterium, viral or parasitic organisms. Infection is spread through contaminated food or drinking water from person to person as a result of poor hygiene. Children mostly die of diarrhea disease due to severe dehydration and fluid loss. Children who are malnourished or have impaired immunity, as well as people living with HIV/AIDS are mostly at risk of diarrhea-related deaths (WHO, 2024).

Globally, there are nearly 1.7 billion cases of childhood diarrhea disease every year and around 443,832 of under-5 children with an additional 50,851 children aged 5 to 9 years dies from this disease (WHO, 2024). According to studies done

by Okafor et al (2022) diarrhea prevalence rate in Nigeria stood at 18.8% and is one of the worst in Sub-Sahara Africa and above the average of 16%. Annually, it accounts for over 16% of child deaths and an estimated 150,000 deaths mainly amongst children under-five years of age (Okafor et al., 2022). Oyefabi et al (2023) reported that Nigeria's Demographic and Health Survey 2018 indicates under-five mortality rate to be 132 deaths per 1,000 live births while infant mortality rate is 67 deaths per 1,000 live births. More worrisome is the fact that majority of childhood diarrhea in Nigeria is domiciled at the Northern Nigeria, the region where Plateau State lies. The NDHS 2018 report indicates that 37.7% of children in Northern Nigeria had more episodes of diarrhea compared to 21.1% from Southern Nigeria over the same period (Oyefabi et al., 2023).

There are three clinical types of diarrhea which include: (1) acute watery diarrhea—lasts several hours or days and includes cholera; (2) acute bloody diarrhea—also called dysentery; (3) persistent diarrhea—lasts 14 days or longer. Also, diarrhea due to infection is widespread throughout developing countries including Nigeria. In low-income countries, children under 3 years of age experience three episodes of diarrhea, every year. Each episode deprives the child of the nutrition necessary for growth. As a result, diarrhea is the major cause of malnutrition among children of under-five and malnourished children are more likely to come down with diarrhea related illnesses (WHO, 2024). Olubunmi and Bolaji, (2017) reported that on the average 194,000 Nigerian children die of diarrhea annually. They also opined that 94% of diarrhea disease burden in Nigeria has been attributed to the environment and associated with risk factors such as unsafe drinking water, lack of sanitation, and improper hygiene.

Other researchers reported that poor weaning methods which promote bottle feeding and insanitary environment also make children susceptible to diarrhea diseases (Ogunrinde et al., 2012).

WHO (2024) states that diarrhea causes include: bacterial infections, malnutrition, water contaminated with human feces, and can also spread from person to person aggravated by poor personal hygiene. Foods prepared under unhygienic conditions, unsafe domestic water storage and handling, fish and seafood from polluted water bodies can also contribute to diarrhea diseases.

Diarrhea disease can have a negative impact on the physical fitness of a child as well as the mental development. This is because diarrhea can cause electrolyte imbalance, dehydration, and defective immune system responses (Oruikor & Durotoye, 2023).

Diarrhea prevention may include proper breastfeeding, exclusive breastfeeding, personal hygiene practices, food hygiene practices, washing hands with soap and water after using the toilet, child health education of mothers and caregivers, early detection of signs and symptoms, immunization, and early treatment with the proper medication (Oruikor & Durotoye, 2023). Effective home management of diarrhea is the hallmark of diarrhea control programs in Nigeria; these include proper administration of ORS, use of zinc tablets, correct feeding practices during diarrhea episodes, and recognition of time to seek health care.

Diarrhea is a leading killer of children, accounting for approximately 9 per cent of all deaths among children under age 5 worldwide in 2021. This translates to over 1,200 young children dying each day, or about 444,000 children a year, despite the availability of a simple treatment solution.

Most deaths from diarrhea occur among children less than 5 years of age living in South Asia and sub-Saharan Africa. Despite this heavy toll, progress is being made. From 2000 to 2021, the total annual number of deaths from diarrhea among children under 5 decreased by 63 per cent (UNICEF, 2024).

In the past, for most people, severe dehydration and fluid loss were the main causes of diarrhea-associated deaths. Now, other causes such as septic bacterial infections are likely to account for an increasing proportion of all diarrhea-associated deaths (WHO, 2024).

Diarrhea normally starts at home and mothers are the caregivers to under-five children, they decide on the type of food given to children and the overall care given to children. Therefore, mothers' knowledge about diarrhea diseases is important in order to take appropriate actions that will prevent and/or manage the disease so as to reduce morbidities and mortalities related to diarrhea (Olubunmi & Bolaji, 2017).

Previous studies carried out in Northern and Southern parts of Nigeria indicated wide gap on mothers' knowledge and awareness on the management of childhood diarrhea (Oruikor & Durotoye, 2023) hence the need for this present study.

Materials and Methods

Study area

This study was carried out in different households/hospitals in Kuru & Vwang districts of Jos South LGA Plateau State Nigeria. Jos South is one of the 17 local government areas in Plateau State which comprises of five districts namely Du, Gyel, Vwang, Kuru and Zawan with many villages making up the districts. The local government area has a population of 306,716 people from the last national census of 2006 though had been projected to have a population of 458,100 as of 2022 (NBS, 2022 & NPC, 2022).

Majority of the villages and districts lack basic piped borne water and depends on well water for their day to day household activities.

Study population

Mothers of children of under-five, who are at home with their babies or on a hospital admission was used for this study.

Sample size determination

A suitable sample size of children of under-five was selected within the target population. The sample size was derived as follows: A prevalence rate of 49.3% (Jiwok et al., 2021) was taken from their studies with margin of error or precision set at 5%. 95% confidence limit was used using the formula:

$$N = \frac{Z^2 P (1-P)}{d^2}$$

Where N = minimum sample size
Z = 95% Confidence Limit (1.96)
P = local prevalence (49.3%)
d = Marginal error (5%)

$$N = \frac{(1.96)^2 \times 0.493 (1-0.493)}{0.05^2}$$

$$N = \frac{(1.96)^2 \times 0.493 (0.507)}{0.0025}$$

$$N = \frac{3.846 \times 0.493 \times 0.507}{0.0025}$$

$$N = \frac{0.9602117616}{0.0025} = 384.084$$

N = 384 mothers of under-five children plus 10% attrition value of 38.4 which is 38.4. Therefore, Minimum sample size to be used is 384 +38.4 =422 mothers of under-five children.

Inclusion and Exclusion Criteria

Inclusion Criteria

1. Mothers who have a child aged 0-5 yrs
2. Mothers whose resident is in Kuru & Vwang districts of Jos South LGA

Exclusion Criteria:

1. Mothers who are not resident of Kuru & Vwang districts.

Permission/Ethical Clearance

Permission was obtained from mothers with the use of consent forms while ethical clearance was obtained from different hospitals from their hospital ethical committee.

Sample Collection

A structured questionnaire was issued to mothers of under-five children who consented to participate in this study. The questionnaire was collated and analyzed.

Instrument for Sample Collection

Consent form and questionnaire was used for the purpose of obtaining information on diarrheal management.

Method of Data Analysis

The collected data was analyzed using descriptive statistical analysis in Statistical Package for Social Sciences (SPSS). Demographic characteristics of mothers were presented in tables, percentages and bar charts while responses on our questionnaire were analyzed using Chi-square test. The collected data was displayed in tables, frequency, percentages and weighted mean of variables.

Results

A total of 420 mothers took part in the survey. Socio demographic data reveal that among the mothers who participated in the study, 145(34.5) % was in the age group of 31-40years, 137(32.6) % was in the age group of 21-30years, 79(18.8) % was in the age group of 41-50years, while 36(8.6) % was in the age group of 16-20years and 23(5.5) % was in the age group of 51years and above. On their level of education, 160(38.1) % have senior school certificate examination, 126(30.0) % have diploma certificate, 67(16.0) % have first school leaving certificate while 51(12.1) % have different degree certificate and 16(3.8) % have post degree certificate. Higher number of the women 124(29.5) % were housewives, 109(26.0) % were traders, 104(24.8) % were farmers, 57(13.6) % were civil servants and 26(6.2) % artisans. On their religious beliefs, majority 396(94.8) % were Christians, 15(3.6) % were Islam while 7(1.7) % practice other religions. (Table 1)

Table 1: Socio-demographic characteristics of mothers (n-420)

Variables	Group	No. of Respondents	Percentage
Age	16-20	36	8.6
	21-30	137	32.6
	31-40	145	34.5
	41-50	79	18.8
	51 and above	23	5.5
Education	FLSC	67	16.0
	SSCE	160	38.1
	Diploma	126	30.0
	Degree	51	12.1
	Post degree	16	3.8
Occupation	Housewife	124	29.5
	Civil servant	57	13.6
	Farmer	104	24.8
	Trading	109	26.0
	Artisan	26	6.2
Religion	Christianity	396	94.8
	Islam	15	3.6
	Others	7	1.7

Source: Survey, 2024

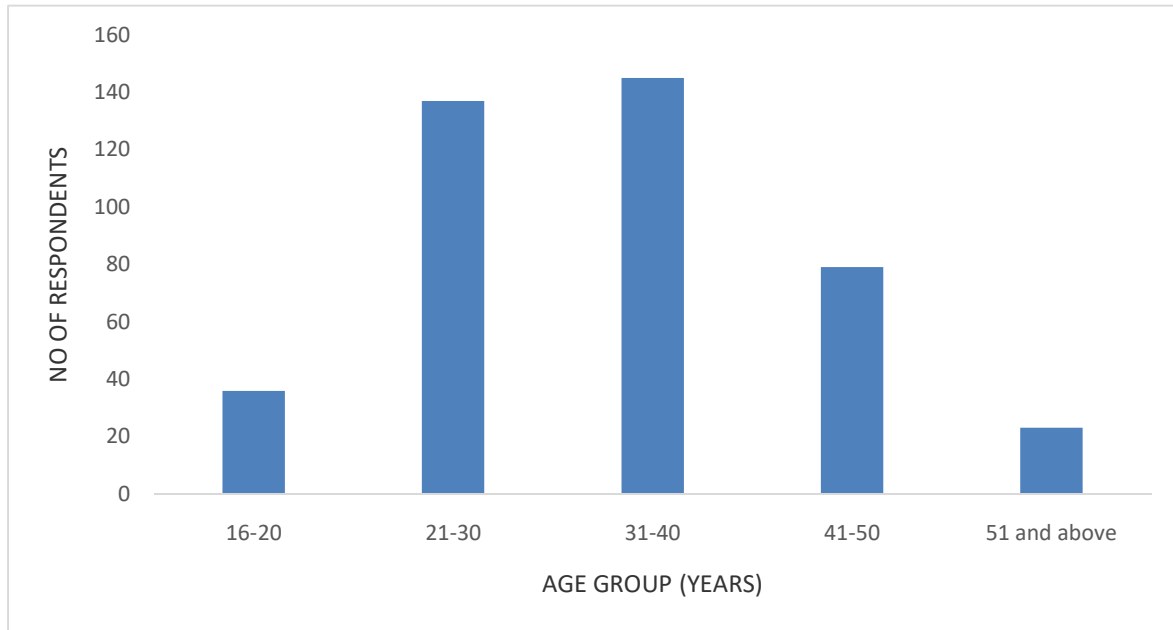


Fig 1: Distribution of mothers according to age group

Majority of the mothers have knowledge about causes, symptoms and prevention of diarrhea diseases among under-five children in the two districts of Jos south L.G.A studied though 152(36.2) % have full knowledge while 247(58.8)

% have partial knowledge. On the other hand 21(5.0) % have no knowledge about causes, symptoms and prevention of diarrhea diseases among under-five children in the area studied. (Table 2)

Table 2: Mothers' knowledge about causes, symptoms, and prevention of diarrhea diseases among under-five children in two districts of Jos South LGA. (n=420)

Questions	Full knowledge (%)	Partial knowledge (%)	No knowledge (%)	Mean	p-value
Do you have knowledge of sign and symptoms of diarrheal among under-five children?	300(71.4)	91(21.7)	29(6.9)	1.38	
How often does your child experience diarrheal disease?	104(24.8)	259(61.7)	57(13.6)	1.89	
What are the signs of diarrheal disease that you know?	10(2.1)	410(86.0)	0(0.0)	2.10	
Feeding practice that can cause childhood diarrheal	193(46.0)	227(54.0)	0(0.0)	1.54	
Overall Knowledge	152(36.2)	247(58.8)	21(5.0)	1.69	<0.001

P <0.05 is significant

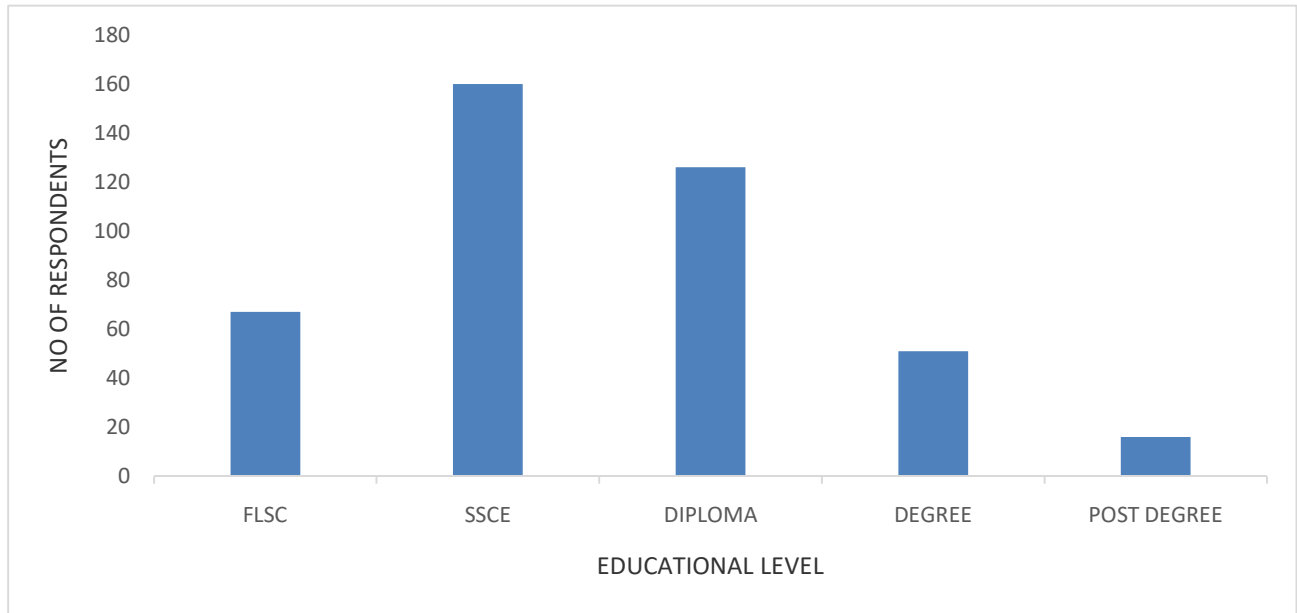


Fig 2: Distribution of mothers according to educational level

A higher proportion of mothers utilize some prevention and management strategies for diarrhea diseases, however 23(5.5) % has adequate knowledge on different ways to prevent diarrhea diseases occurring in children. But in overall, 216(51.4) % have full knowledge about

prevention and management strategies, 177(42.1) % have partial knowledge while 27(6.5) % have no knowledge on how to prevent and manage diarrhea disease among under-five children. (Table 3)

Table 3: Utilization of prevention and management strategies for diarrhea diseases by mothers

Questions	Full knowledge (%)	Partial knowledge (%)	No knowledge (%)	Mean	p-value
Do you give oral rehydration salt (ORS) to your child once diarrheal starts?	314(74.8)	69(16.4)	37(8.8)	1.34	
Do you know how to prepare oral rehydration salt (ORS) at home?	290(69.0)	106(25.3)	24(5.7)	1.37	
Do you give zinc tablets along with ORS once diarrheal starts in your children?	237(56.4)	136(32.4)	47(11.2)	1.55	
What are the different ways to prevent diarrheal disease occurring in children?	23(5.5)	397(94.5)	0(0.0)	1.95	
Overall knowledge	216(51.4)	177(42.1)	27(6.5)	1.55	<0.000

P< 0.05 is significant

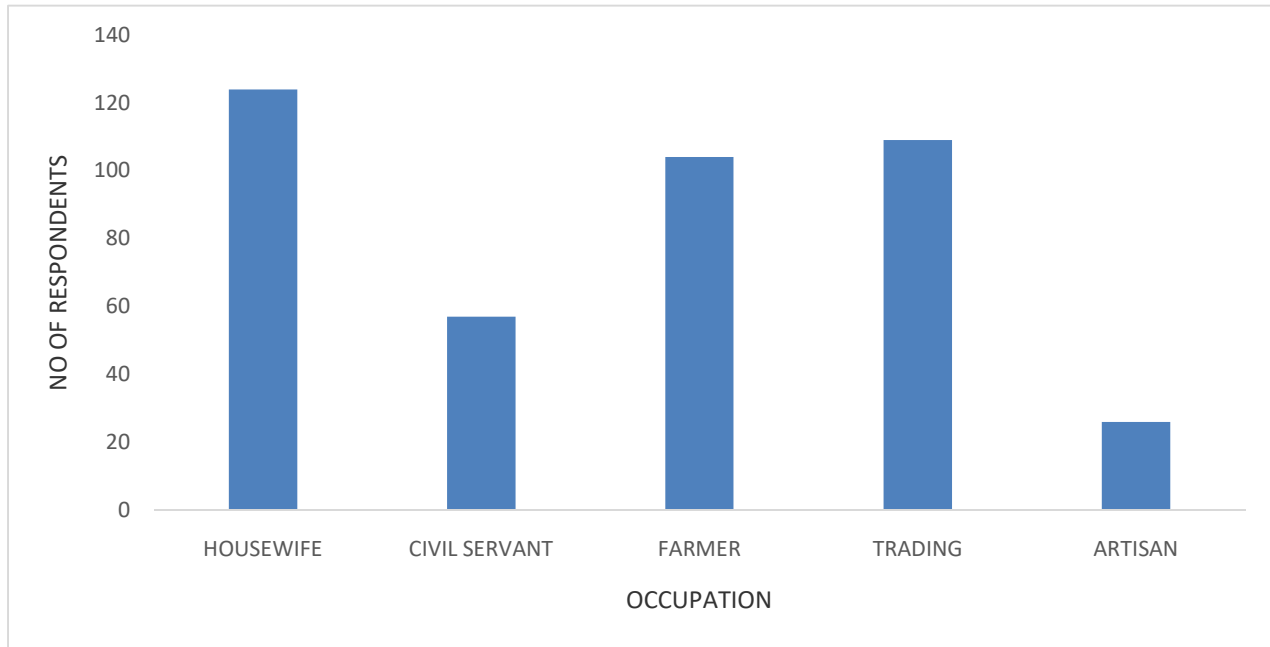


Fig 3: Distribution of mothers according to occupation

Higher number of mothers 221(52.6) % have partial knowledge on the proper implementation of prevention and management strategies for diarrhea diseases among under-five children while 199(47.4) % mothers have full knowledge. Three hundred and seven mothers (73.1) % have partial knowledge on practices that can prevent diarrhea

disease occurring in under-five children as against 113(26.9) % that have full knowledge while 284(67.6) % took their child to the hospital if diarrhea persist for more than 1day as against 136(32.4) % that try other options of management. (Table 4)

Table 4: Barrier to effective implementation of prevention and management strategies for diarrhea disease among under-five children.

	Full knowledge	Partial knowledge	Mean	p-value
If diarrheal, persist for more than one day, do you take your child to hospital?	284(67.6)	136(32.4)	1.32	
What practices among the following do you think can prevent diarrheal disease occurring in children?	113(26.9)	307(73.1)	1.73	
Overall knowledge	199(47.4)	221(52.6)	1.52	0.282 ^{NS}

P< 0.05 is significant, NS: Not significant

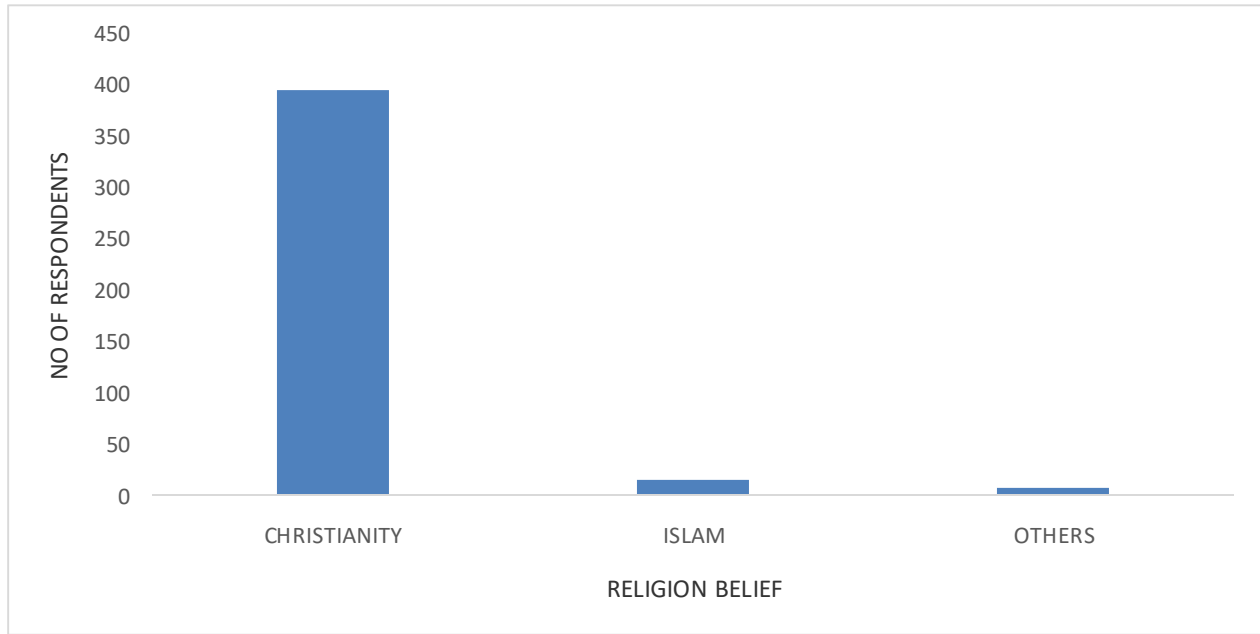


Fig 4: Distribution of mothers based on religious beliefs

Discussion

Childhood diarrhea is a public health concern especially in underdeveloped countries such as Nigeria. It is a common cause of mortality and morbidity in children especially in the under-five years of age. It is therefore necessary to assess mothers' knowledge about management of diarrhea disease among under-five children in two districts of Jos south LGA, Plateau state.

The age of mothers that participated in this study ranges between 16years to above 50years of age and all of them have one form of formal education which ranged from first school leaving certificate to post graduate education. Two-third of the mothers studied has occupations which ranged from artisans to civil servants while one-third was housewives.

Majority of mothers have one form of knowledge about causes, symptoms and prevention of diarrhea disease among under-five children. On the causes, symptoms and prevention of diarrhea 152(36.2%) have full knowledge of diarrhea causes and symptoms, 247(58.8%) have partial knowledge while 21(5.0%) have no knowledge on the causes and symptoms of diarrhea among

under-five children. This high knowledge (full & partial) on the causes and symptoms of diarrhea was similar to the findings of Akpan & Ijezie (2018) who documented (86.2%) of knowledge regarding the cause and transmission of diarrhea by drinking of dirty water. Among the 95% of mothers who have knowledge on the causes and symptoms of diarrhea, higher percentage (58.8%) have partial knowledge with 36.2% of full knowledge may be attributable to their different levels of education where majority have either secondary school education or first school leaving certificate education with few having higher level of education such degrees or post degree certification. Five percent of mothers that have no knowledge on the causes and symptoms of diarrhea may be those who possess only first school leaving certificate.

The high knowledge on the causes and symptoms obtained in this study was at variance with a study conducted in Ethiopia (Merga & Alemayehu, 2015) which reported 20.15% knowledge on the causes of diarrhea among under-five children. This disparity may be attributed to mothers' level of knowledge and exposure between those studied. In this study as well as the work of Akpan & Ijezie (2018) 100% and 98%

respectively of the mothers had at least primary education and above while Ethiopian mothers recorded only 25% of the mothers who had primary education and above.

The finding of this study that only 36.2% of mothers' have full knowledge on the causes, symptoms and prevention of diarrhea agrees with the study done by Rajathi et al (2018) who documented mother's knowledge on home care management of diarrhea to be low as well. They reported that 18.5% of mothers have moderate knowledge, 8.5% have adequate knowledge totaling 27% while 73% of mothers have inadequate knowledge about home care management of diarrhea among under-five children.

On the utilization of prevention and management strategies for diarrhea disease by mothers', this study recorded a higher percentage of mothers (69%) who knew how to prepare oral rehydration salt (ORS) and mothers that give ORS to their children once diarrhea starts to be 74.8%. Also, 56.4% of mothers give zinc tablets or suspension along with ORS once diarrhea starts in their children but only 5.5% of mothers have full knowledge on the various ways diarrhea can be prevented in children.

In this study, good number of mothers has knowledge on the utilization of ORS and zinc for diarrhea management. This finding is in accordance with the work of Oyefabi et al (2023) who reported that knowledge of ORS use for diarrhea prevention was very high among mothers and caregivers but the availability of ORS at home in case a child presents with diarrhea was however very low. Also, 74.8% of mothers who gave ORS once diarrhea starts are in line with the work of Yusuf et al (2022) who documented that majority of their respondents have knowledge on use of ORT in the management of childhood diarrhea and most of them have heard about ORT at two hospital facility in the community studied.

On the use of zinc tablet/suspension for diarrhea management, 56.4% of mothers in this study gave zinc tablet along with ORS. This finding contradicts the work of Olubunmi and Bolaji, (2017) who documented that 32.5% of their respondents rightly indicated that zinc tablet or suspension should be used in managing childhood diarrhea.

According to WHO (2005), zinc can be given as a syrup or as dispersible tablets whichever formulation is available and affordable. By giving zinc as soon as diarrhea starts the duration and severity of the episode as well as the risk of dehydration will be reduced. By continuing zinc supplementation for 10 to 14days the zinc lost during diarrhea is fully replaced and the risk of the child having new diarrhea episodes in the following 2 to 3months is reduced.

WHO (2005) also states that children with some dehydration should receive oral rehydration therapy (ORT) with ORS solution. To determine the amount needed per child, if a child's weight is known, the amount may be estimated by multiplying the child's weight in kg times 75ml. But if the child's weight is not known, the approximate amount according to child's age should be given. Though, the exact amount of solution required will depend on the child's dehydration status. Children with more marked signs of dehydration or who continue to pass frequent watery stool will require more solution than those with less marked signs or who are not passing frequent stools. If a child's wants more than the estimated amount of ORS solution and there are signs of over-hydration, give more. Edematous (puffy) eyelids are a sign of over-hydration. If this occurs stop giving ORS solution but continue with breast milk or plain water and food.

ORS solution should be given to infants and young children using a clean spoon or cup, feeding bottles should not be used. For babies a dropper or syringe without the needle can be used to put small amounts of ORS into their mouth. Children less than 2 years of age should be offered a teaspoonful every 1-2 minutes, older children and (adults) may take frequent sips directly from the cup.

In order to identify any barrier to effective implementation of prevention management strategies for diarrhea disease among under-five children, majority of the mothers in this study (73.1%) have partial knowledge on practices that can prevent diarrhea disease occurring in children such as early and exclusive breast feeding, Vitamin A supplementation and taking Rotavirus immunization among others.

This findings contradicts the report of Momoh et al (2022) who stated that 72% of their respondents breastfed exclusively though only 28% did that for at least six months.

Also, mothers with full knowledge of diarrhea prevention practices (26.9%) is more compared with a study done in Benue state by Ogbeyi et al (2016) where mothers that exclusively breastfed their babies was 2% which can expose such children to diarrhea infections.

The finding of this study that 67.6% of mothers take their child to hospital once diarrhea persist for more than 1 day compares with the findings of Momoh et al (2022) who documented that 55% of mothers took their children to the hospital during diarrhea episodes while 24% sought help from traditional healers. The high percentage of mothers that present their children to the hospital observed in this study may be attributable to the educational status of our participants of which all respondents have at least first school leaving certificate while higher number have senior school certificate and diploma certificate.

The high partial knowledge on different preventive strategies (54.1%) for diarrhea in this study may be attributable to the fact that majority of our respondents possess low academic qualifications such as first leaving certificate and high number of respondents who are strictly housewife which may not expose them to interact with other colleagues with superior know-how and learn from them on better ways diarrhea can be prevented.

Conclusion

According to results obtained from this study, most mothers have partial knowledge on management of diarrhea disease among under-five children. Also, few mothers have no knowledge at all on causes, symptoms and prevention of diarrhea while only 5.5% have full knowledge on the various ways diarrhea can be prevented in under-five children. Early identification and management of diarrhea at home is essential in preventing diarrhea related mortality and morbidity and how to improve on this should be advocated through a study like this. Since a woman's health behaviour has an impact on the health of her family, good woman's health literacy should be a priority to be improved on so as to have a positive impact on the health of her immediate family members especially her children.

Author contributions

All authors made a significant contribution to this work, from the conception through the study design, execution, and acquisition of data, analysis and interpretation of results. They equally took part in drafting, revising and critically reviewing the manuscript, gave final approval of the version to be published.

Conflict of interest

There is no conflict of interest between and among authors in any aspect of this work either financially or otherwise.

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	Website: www.ijarbs.com
	Subject: Health Sciences
Quick Response Code	
DOI: 10.22192/ijarbs.2025.12.05.004	

How to cite this article:

Ozor Josephat Ejike, Musa Juliana Sebastian, Soltade Gabriel Akinwale, Hauwa Kinjir, Uzoechina Rosemary Adanma, Chukwu Kennedy, Fador Nimfa Geofrey, Odu Stephen Iyeje. (2025). Assessment of mothers' knowledge about management of diarrhea disease among under-five children in two districts of Jos South lga, Plateau state. Int. J. Adv. Res. Biol. Sci. 12(5): 26-38.

DOI: <http://dx.doi.org/10.22192/ijarbs.2025.12.05.004>