

Risk Factors Associated with Recurrence of Diarrheal Episodes among Children less than Two Years

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Background: Diarrhea is the leading cause of childhood morbidity and mortality. Failure of exclusive breast feeding, improper weaning practices, poor sanitation, lack of personal hygiene and inadequate water supply are among major risk factors of diarrheal disease in children. **Aim of the study** is to determine risk factors associated with recurrence of diarrheal episodes among children less than two years. **Setting:Subjects:** A convenient sample of 100 mothers having children less than two years who are suffering from diarrhea constituted the subjects **Tool:** One tool was used for data collection: Risk Factors Associated with recurrence of Diarrheal Episodes among Children under Two Years Structured Interview Schedule. **Results:** that there is statistically significant relation between recurrence of diarrheal episodes of mothers' children and their breast-feeding practices, weaning practices, personal hygiene, vaccination status and seasonal pattern where $P=0.001$, $P<0.001$, $P=0.003$, $P=0.009$ and $P=0.029^*$ respectively. **Conclusion:** The findings of the present study concluded that mothers who have children with recurrence of diarrheal episodes are confronting multiple risk factors like younger age of mothers, low family income, family size (overcrowding), feeding type, residence, failure of exclusively breast-feeding, inappropriate weaning practices, poor personal hygiene, inadequate water sanitation, poor environmental sanitation, and seasonal pattern.

Keywords: Risk Factors, Diarrheal Episodes, Children.

Introduction

Diarrhea disease is the second leading cause of death among children under 5 years and was responsible for deaths of 370.000 children in 2019 (Helmi et al., 2022; WHO, 2021). Internationally, there are almost 1.7 billion cases of childhood diarrheal disease every year (WHO 2017). In developing countries, children under three years of age have average of three episodes of diarrhea every year (Baye et al., 2021).

Diarrhea is defined as an increase in the fluidity, volume, and number of stools related to each individual of usual habits. Infectious diarrhea is the most common type of diarrhea among children under 5 years. It is caused by infection agents like viruses such as rotavirus which is the most common agent can cause diarrhea, (Madkour 2016).

Risk factors associated with diarrhea such as early weaning, early introduction of milk products, contaminated food, low nutritional status poor water storage, poor hygiene, lack of environmental sanitation as well as male gender, poor food cooking

Part I: Socio-demographic characteristics of mothers and their children.

- Characteristics of mothers such as age, education, occupation, family income, residence, and crowding index.
- Characteristics of children such as age, sex, birth order, and birth weight.

Part II: Diarrhea assessment sheet) habits, frequency, duration, amount, odor, color, and consistency).

- Signs and symptoms such as (fever, nausea, vomiting, and abdominal pain)
- Assessment of dehydration based on GEMS criteria which are (general condition, eyes, mouth and skin pinch).

Part III: Risk factors associated with Recurrence of diarrheal episodes among children less than two years such as breast feeding practices, bottle-feeding practices, weaning, and personal hygiene of the child, sanitation factors, vaccination and seasonal pattern).

Scoring system:

The response to the items of the tool based on three points Likert scale:

- Always = 2
- Sometimes = 1
- Never = zero

The score of mother's practices is calculated as follow:

- Good = 65% and more
- Satisfactory = 50% to less than 65%
- Unsatisfactory = less than 50%

Method:

- Official letter was directed to the responsible authority of chosen Maternal and Child Center in order to obtain their approval to collect the

data after explaining the purpose of the study.

- The tool was developed by the researcher after reviewing the current and relevant literature.
- The reliability of the tool was done by measuring the internal consistency of its items using Cronbach Coefficient Alpha Test where $r = 0.720$
- A pilot study was carried out on ten mothers (10%) attending the previously mentioned setting to ascertain the clarity and applicability of the tool. Accordingly, some modifications were done. Those mothers were excluded from the study subject.
- Every mother was interviewed in the previous selected setting individually after her child is being diagnosed to collect the necessary data to assess the risk factors.

- The duration of each interview lasted 20 minutes.

- **Statistical analysis:** The collected data was categorized, coded, computerized, tabulated and analyzed using Statistical Package for Social Sciences (SPSS) version 20 program.

Ethical considerations: An informed written consent was obtained from each study subject after explanation of the study purpose. Anonymity and privacy of the study subjects, confidentiality of the collected data, and the subject's right to withdraw at any time were maintained.

Results:

Table (1) shows the characteristics of mothers having children with recurrence diarrheal episodes. The table clarified that

more than half of mothers (53.0%) their age ranged from 18 to less than 25 years and majority of them (90.0%) are married. Regarding level of education, it is observed that 30% of mothers had secondary education. The table also highlighted that nearly three fifths of mothers (58%) were housewife.

It was also apparent that family income among 35.0% of the mothers was not enough for living and less than half of them (48.0%) lived in rural areas.. Crowding index of 44.0% of the mothers was moderate

Table (2) Characteristics of children with recurrence of diarrheal episodes. It is cleared from the table that the age of more than one third of children (37%) were 12 to less than 18 months old. The same table clarified that more than half (56.0%) of children were boys. Concerning child's birth order, it was found that second born child constituted nearly half of the studied mothers' children (48.0%) while the first born child constitute 25%.

Regarding gestational age, it is observed from the table that, 70% of children had gestational age ranged from 38 to 42 weeks of gestation. Moreover, nearly two thirds (64.0%) of children had birth weight ranged from 2500 to 4000 grams. Concerning type of feeding it was cleared that, more than one third of children (37.0%) received breast milk and 31.0% received mixed feeding. It was obvious that 30.0% of children go to nursery school, while 70.0% of them did not go.

Table (3) Distribution of the studied mothers according to their total percent score of their practices regarding recurrence of diarrheal The table portrays that 54.0% and 46.0% of mothers were

obtain satisfactory regarding their breast and bottle feeding practices. On the other hand the table illustrates that, 55.0% and 45.0% of mothers were unsatisfactory regarding weaning and personal hygiene practices. The table also shows that, 49.0%, 65.0%, 45% of mothers' were obtained unsatisfactory regarding environmental sanitation, water sanitation and contact with animal respectively. Moreover, about three quarters 75% and 85.0% of mothers were good in their practice concerning seasonal pattern and vaccination of their children in that order.

The table show that slightly more than half of mothers (52%) obtained unsatisfactory in overall practices while only 15 % were good.

Figure (1): Demonstrate the percent distribution of recurrence of diarrhea episodes among children less than two years. It is revealed from the figure that, more than one third of children (36%) had medium frequency of diarrhea, while less than one third of children (30.0%) had low frequency of diarrhea and one third of them (34.0%) had high frequency of diarrhea.

Table (4) Presents relation between recurrence of diarrheal episodes and total percent score of mother's practices. It was obvious that there is statistically significant relation between recurrence of diarrheal episodes of mothers' children and breast-feeding practices, weaning practices, personal hygiene, vaccination status and seasonal pattern where $P=0.001$, $P<0.001$, $P=0.003$, $P=0.009$ and $P=0.029^*$ respectively. Moreover, there were statistical significant differences between recurrence of diarrheal episodes and total score of overall practice of mothers were $P<0.001$

At the opposite side, there is no statistically significant relation between recurrence of diarrheal episodes of mothers` children and formula feeding, environmental sanitation and seasonal pattern and contact with animals.

Discussion

Diarrhea is still appeared to be as one of the leading global killers and disability-adjusted life-years lost, particularly in the infant and young children. (Mebrahtom et al., 2022).

Younger mothers were at risk of diarrheal recurrence. In the current study more than half of mothers whose age were between 18 to less than 25 years their children have high frequency of diarrhea episodes (Table 1). It may be due to they have less experience in caring for their children`s health as a result of their younger age. The result of present study is congruent with Musihb et al., (2020) who found that, younger mother aged from 20-29 having the highest percent of occurrence of diarrhea of their children than older mothers. This finding also in the same line with Claudine et al. (2021) who conducted study about "association between socio demographic factors and diarrhea in children under 5 years in Rwanda" he found that, there was a significant association between diarrhea and the mother`s age.

Sex inequalities in diarrhea disease have been observed across many studies. So, regarding to socio-demographic characteristics of children it was revealed from the present study in that more than half of children were males (table 2) this may be justified that parents, especially in low socio-economic countries and rural areas, tend to prefer male children, therefore they care for them differently by

giving them more privilege like play in street, contact with animals and give their children much more unhealthy and contaminated food. This results in the same line with study by Goel et al (2021) who found that more than half of children were boy gender. On the other hand, this result disagreement with Alghadeer et al., (2021) who mentioned that, more than half of the studied children who had recurrence of diarrhea were girle gender.

The mother is usually the main caregiver during early childhood and plays a fundamental role in her child`s health through proper and healthy practices. The present study show that, slightly more than half of mothers obtained unsatisfactory in overall practices presented in table 3. This can be justified by more than half of mothers their age below 18 years , have low family income, and leave in rural area as presented in table1. This finding is in the same line with (Workie et al., 2018 and Eman Saad et al., 2022) who found that, practice of mothers were unsatisfactory about the prevention of less than -five diarrheal diseases and they attributed that to their younger age, their low family income and the crowding index..

Good sanitations factors like healthy water source and healthy environment play dynamic role in reduction of infection and being health. The present study demonstrated in that, there is no statistically significant relation between recurrence of diarrheal episodes of studied children and sanitation factors (water sanitation and contact with animals (table 4). These findings supported by (Aziz et al., 2018 and Eman Saad et al., 2022) who showed that, there is no statistically significant relation between recurrence of

diarrheal episodes of studied children and sanitation factors and water supply.

Finally, the current study had been able to shed some light on the various risk factors associated with recurrence of diarrheal episodes among children less than two years. In this respect, pediatric nurse can help those mothers to increase

awareness regarding risk factors of diarrhea to promote the child health and well-being.

Table (1): Characteristics of Mothers Having Children with Recurrence of Diarrheal Episodes.

Mothers ' Characteristics	No (n=100)	%
Age in years		
-18	53	53.0
-25	24	24.0
35 -30	23	23.0
Marital status		
Married	90	90.0
Divorced	7	7.0
Widow	3	3.0
Education		
Illiterate	3	3.0
Read and write	17	17.0
Primary	20	20.0
Preparatory	10	10.0
Secondary	30	30.0
Technical institution	10	10.0
University	10	10.0
Occupation		
House wife	58	58.0
Working	42	42.0
Family income		
Enough	65	65.0
Not enough	35	35.0
Residence		
Rural	48	48.0
Urban	52	52.0
Home		

Own	75	75.0
Rent	25	25.0
Family type		
Nuclear	75	75.0
Extended	25	25.0
Crowding index		
Low	22	22.0
Moderate	46	46.0
High	32	32.0
Having mother class about diarrhea		
Yes	88	88.0
No	12	12.0
Source of information about diarrhea		
Doctor	45	45.0
Nurse	35	35.0
Friends and relatives	17	17.0
Television	3	3.0

Table (2): Characteristics of Children with Recurrence of Diarrheal Episodes (n=100).

Children ' Characteristics	No	%
Child age in months		
▪ > 6	13	13.0
▪ 6 -	28	28.0
▪ 12 -	37	37.0
▪ 18 >24	22	22.0
Gender		
▪ Boys	56	56.5
▪ Girls	44	44.0
Child order		

▪ The first	25	25.0
▪ The second	48	48.0
▪ The third	16	16.0
▪ The fourth and more	11	11.0
Gestational age		
▪ >38 weeks	10	10.0
▪ 38-42 weeks	70	70.0
▪ >42 weeks	20	20.0
Birth weight		
▪ < 2500 gm	33	33.0
▪ 2500-4000 gm	64	64.0
▪ > 4000 gm	3	3.0
Feeding type		
▪ Breast feeding	37	37.0
▪ Bottle feeding	35	35.0
▪ Mixed	28	28.0
Go to nursery school		
▪ Yes	30	30.0
▪ No	70	70.0

Table (3): Distribution of the Studied Mothers According to total Percent Score of Their Practices

Mother's practices	Unsatisfactory <50%		Satisfactory 50 - <65%		Good ≥ 65%	
	.No	%	.No	%	.No	%
Breast feeding practices	10	10.0	54	54.0	36	36.0
Formula-feeding practices	15	15.0	46	46.0	39	39.0
Weaning	55	55.0	20	20.0	25	25.0
Personal hygiene	45	45.0	35	35.0	20	20.0
Environmental sanitation	49	49.0	17	17.0	34	34.0
Contact with animals	45	45.0	30	30.0	25	25.0
Water sanitations	65	65.0	20	20.0	15	15.0
Vaccination status	30	15.0	19	9.5	85	85.0
Seasonal pattern	50	25.0	0	0	75	75.0
Overall practice	52	52.0	33	33.0	15	15.0

Figure (1)

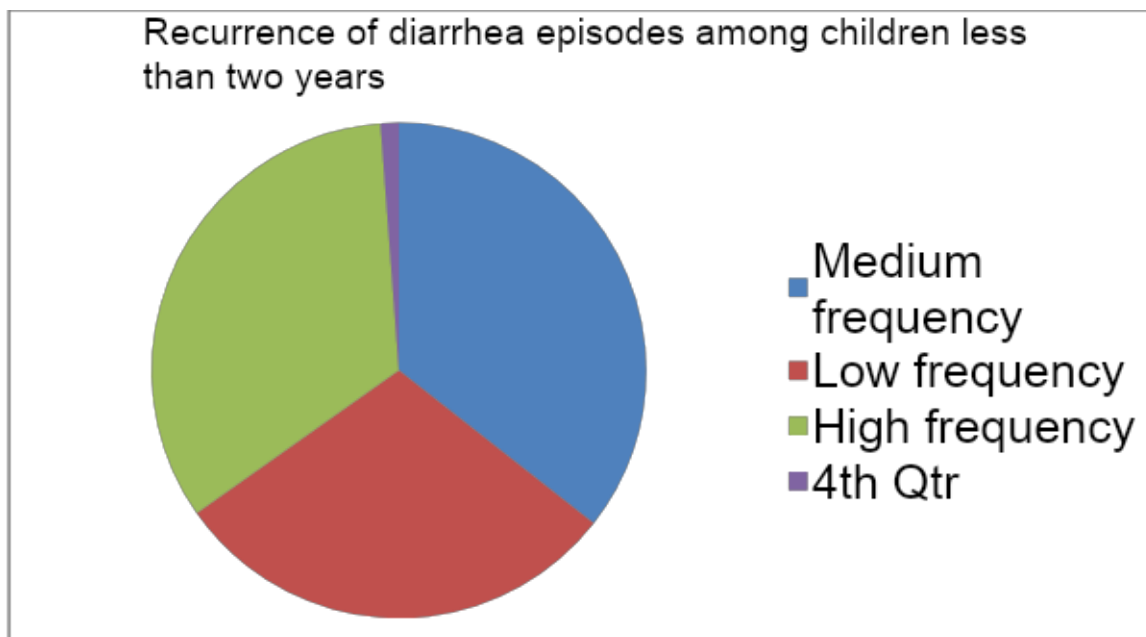


Table (4): Relation between recurrence of diarrheal episodes and total percent score of mother's practices.

Mother's practices	Recurrence of diarrheal episodes						χ^2	p
	.No		%		.No			
Breast feeding	(Low (n = 25		(Medium (n = 24		(High (n = 18		χ^2	p
Unsatisfactory <50%	.No	%	.No	%	.No	%		
Satisfactory 50 - <65%	2	8.0	2	8.3	5	27.8		
Good ≥ 65%	12	48.0	18	75.0	9	50.0		
	11	44.0	4	16.7	4	22.2	*18.021	*0.001
Bottle-feeding practices	(Low (n = 13		(Medium (n = 25		(High (n = 27		χ^2	p
Unsatisfactory <50%	.No	%	.No	%	.No	%		
Satisfactory 50 - <65%	3	23.1	5	20.0	9	33.3		
Good ≥ 65%	6	46.2	12	48.0	13	48.2		
	4	30.7	8	32.0	5	18.5	6.721	0.151
Weaning practices	(Low (n = 27		(Medium (n = 36		(High (n = 34		χ^2	p
Unsatisfactory <50%	.No	%	.No	%	.No	%		
Satisfactory 50 - <65%	9	33.3	24	66.7	21	62.7		
Good ≥ 65%	7	25.9	9	25.0	11	32.4		
	11	40.8	3	8.3	2	5.9	*37.685	*0.001>
Continuous Mother's practices	(Low (n = 30		(Medium (n = 36		(High (n = 34		χ^2	p
Personal hygiene	.No	%	.No	%	.No	%		
Unsatisfactory <50%	10.0	33.3	16.0	44.4	14	41.2		
Satisfactory 50 - <65%	10.0	33.3	16.0	44.4	15	44.1		
Good ≥ 65%	10.0	33.3	6.0	11.2	5	14.7	*16.253	*0.003
Environmental sanitation							χ^2	p
Unsatisfactory <50%	11	36.7	18	50.0	20	58.8		
Satisfactory 50 - <65%	9	30.0	12	33.3	9	26.5		
Good ≥ 65%	10	33.3	6	16.7	5	14.7		
							8.13	0.091
Water sanitation							χ^2	p
Unsatisfactory <50%	19	63.3	25	69.4	24	70.6		
Satisfactory 50 - <65%	8	26.7	9	25.0	8	23.5		
Good ≥ 65%	3	10.0	2	5.6	2	5.9		
							1.205	0.877
Contact with animals and insects							χ^2	p
Unsatisfactory <50%	12	40.0	15	41.7	16	47.1		
Satisfactory 50 - <65%	8	26.7	12	33.3	11	32.3		
Good ≥ 65%	10	33.3	9	25.0	7	20.6		
							4.363	0.359
Vaccination status							χ^2	p
Unsatisfactory <50%	8	26.7	4	11.1	3	8.8		
Satisfactory 50 - <65%	2	6.6	5	13.9	3	8.8		
Good ≥ 65%	20	66.7	27	75.0	28	82.4		
							*13.480	*0.009
Seasonal pattern							χ^2	p
Unsatisfactory <50%	5	16.7	12	33.3	8	23.5		
Satisfactory 50 - <65%	0	0.0	0	0.0	0	0.0		
Good ≥ 65%	25	83.3	24	66.7	26	76.5		
							*7.090	*0.029
Overall practice							χ^2	p
Unsatisfactory <50%	11	36.7	18	50.0	20	58.8		
Satisfactory 50 - <65%	11	36.7	15	41.7	11	32.3		
Good ≥ 65%	8	26.7	3	8.3	3	8.8		
							*17.731	*0.001

FE: Fisher Exact

MC: Monte Carlo

χ^2 : Chi square test

p: p value for comparing between the studied groups
Statistically significant at $p \leq 0.05$:*

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