

Home Management of Childhood Diarrhoea by Mothers Presenting at a Tertiary Hospital in Bangladesh

Akhtaruzzaman M¹, Hossain MA², Choudhury AM³, Islam MN⁴, Dhar SK⁵

Abstract

Introduction: Diarrhoea is a leading cause of under-five morbidity and mortality. Most of the diarrhoeal episodes are treated initially at home by mothers. The objective of the study was to assess mothers' knowledge and practice of home management of diarrhoea. **Material and Methods:** This hospital based descriptive cross sectional study was carried out in Mymensingh Medical College Hospital. Three hundred and sixty children under five years of age having acute diarrhoea were included in the study by systematic random sampling. A structured pretested interview schedule was used to collect data. There were 11 knowledge and 11 practice questions; each was scored a point if correctly answered. The level of knowledge and the level of practice both were classified as poor for score 0-5 and good for score 6-11. **Results:** Of the 360 mothers, 45.55% had a good level of knowledge, while 33.89% had good level of practice. Both higher knowledge and practice score was significantly ($p < 0.001$) associated with mother's age, educational level and occupation and father's educational level occupation and income. After adjusting for other factors, mother's age was significantly associated with level of knowledge ($p = 0.003$) and mother's educational level was significantly associated with both level of knowledge ($p = 0.001$) and practice ($p = 0.002$) in home management of diarrhoea. **Conclusion:** The study has shown a low level of knowledge and practice in mothers regarding management of diarrhoea. The educational programs for mothers must be an essential part of the health facility programs.

Key words: Diarrhoea, knowledge, practice, mothers.

Introduction

Diarrhoea is defined as the passage of three or more loose or watery stools in a 24-hours period¹. Diarrhoeal disorders in childhood account for 18% of childhood deaths, with an estimated 1.5 million deaths per year globally, making it the second most common cause of child deaths worldwide². In Bangladesh, diarrhea accounts for 11% of under-five mortality³. Each episode deprives the child of nutrients necessary for growth, thus diarrhoea is a major cause of malnutrition and malnourished children are more likely to die from diarrhoea⁴.

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The pivotal role of oral rehydration therapy (ORT) in the management of diarrhoeal diseases is well established⁵. Approximately, 90% cases of diarrhoea can be successfully managed with oral rehydration therapy and continued feeding without use of drugs. Oral rehydration therapy is a well established therapy for the prevention and treatment of dehydration. This is as effective as intravenous therapy and in most cases can be carried out at home, thus avoiding hospital stay⁶.

Since 1979 ORT has been the cornerstone of diarrhoea management worldwide⁷. In May 2004, WHO and UNICEF released a joint statement to decrease diarrhea deaths among the worlds most vulnerable children. This statement recommended the use of low osmolality oral rehydration solution (ORS) that reduces the need for intravenous fluids, and Zinc supplementation as an adjunct therapy that decreases the duration and severity of the diarrhoea episode and the likelihood of subsequent infection in 2 to 3 months following treatment⁸. Despite the evidence of benefits, there has been little progress on the widespread use of ORS and Zinc for diarrhoea treatment⁹. It is a common observation that some mothers still cannot mix commercially available ORS properly nor can they make sugar-salt solution at home or realize the importance of giving more fluids during acute diarrhoea of their children¹⁰. A recent review suggests that barely 39% of children with diarrhoea in developing countries receive the recommended treatment¹¹. Additionally, inappropriate feeding practices by the mothers may contribute to worsen diarrhoeal morbidity and mortality^{12,13,14}.

This study aimed to assess the current level of knowledge and practices of mothers with regard to home management of childhood diarrhoeal diseases in Mymensingh region of Bangladesh.

Materials and Methods

This was a non-experimental descriptive, cross sectional hospital based study carried out on 360 mothers of children with diarrhoea attending the Pediatric Out Patient Department (OPD) of Mymensingh Medical College Hospital (MMCH) from September 2014 to February 2015. People from all strata of the society receive care at the Pediatric unit of MMCH which holds routine outpatient services, primary care and specialized clinics. Mothers who had a child less than 5 years of age suffering from acute watery diarrhoea with or without any other symptoms were included in this study. Patients who had earlier consultations at any other health facility for the current diarrhoeal illness were excluded from the study.

The mothers who were willing to give relevant information were enrolled in the study by systematic random sampling. Sample size estimation was determined using the formula¹⁵) for estimating minimum sample size for descriptive studies when studying proportions with an entire population size <10,000. It was found from OPD records that everyday on an average 33 mothers having under-five children with diarrhoeal diseases attended in OPD of MMCH.

So, in six months excluding the day-offs and other holidays about 4851 mothers having children with diarrhoeal diseases were expected to attend the OPD. It was assumed that 50% of the mothers would have adequate knowledge of home management of diarrhoea at a 95% confidence level with a 10% margin of error. This gave a sample estimate of 356 mothers. Thus every 13th mother presented with a child suffering from diarrhoea was selected for the study.

Data was collected using a structured, pretested interview schedule containing information on socio-demographic characteristics of the patients and their mothers, medical history of the current diarrhoeal illness, mothers knowledge on diarrhoea aetiology, home management of diarrhoea by the mothers.

There were 11 questions on knowledge and awareness and 11 on practice of home management of diarrhoea. The questions on knowledge and awareness included causes of diarrhoea, preparation and preservation of ORS, continued feeding, use of recommended homemade fluid, increased fluid intake and the use of zinc for home management of diarrhoea. The practice questions included treatment given for the present diarrhoea episodes, the use of ORS and zinc, feeding and hand washing practices. A correct response was given a score of one (1), and an incorrect one, a score of zero (0). The level of knowledge and the level of practice both were classified as poor for score 0-5 (i.e. <50%) and good for score 6-11 (i.e. >50%).

Data was collected by principal author himself. After each interview, interview schedule was checked for inconsistency and incompleteness. Data was analysed by using computer software Statistical Package for Social Sciences (SPSS) version 21.0. Bivariate analysis involved the use of Chi-Square for testing the significance of associations between categorical variables. Logistic regression was carried out for multivariate analysis. The level of significance was set at $p < 0.05$.

This study was approved by the research ethical committee of MMC and informed consent was obtained from all participants prior to enrolment.

RESULTS

A total of 360 mothers of patients aged less than 5 years presenting with diarrhoea to the MMCH were selected for the study. The ages of the patients ranged from 2 to 59 months with a mean age of 18.01 months ± 14.6 standard deviation (SD). Non-bloody diarrhoea was present in 322 (89.44%) and bloody diarrhoea

occurred in 38 (10.56%) patients. Two hundred and sixty-two (72.78%) mothers came from low income group, 73 (20.28%) mothers came from middle income group whereas 25 (6.94%) mothers came from upper income group. Fifty-six (15.56%) mothers were illiterate, 107 (29.72%) had primary school education (incomplete), 97 (26.94%) had primary school education (complete), 71 (19.72%) had secondary school education (incomplete), while 29 (8.06%) had secondary (complete) or higher education (Table 1). In terms of occupation, 330 (91.67%) mothers were housewives, while 20 (5.55%) mothers were service holders and 10 (2.78%) mothers had other occupations (day labourer, student etc).

Three hundred and twenty (88.88%) mothers gave ORS to their children during acute diarrhoea (Fig. 1). Zinc was used in 128 (35.56%) children. Out of 360 cases 38 (10.55%) had dysentery but antibiotics, antiprotozoal and antiemetic besides ORS and zinc was used in 225 (62.50%) cases (Fig. 2).

On the question of the most common cause of diarrhoea in children, 265 (73.61%) answered correctly, contamination of food or water by germs or infectious organisms. Table 2 and Table 3 show the responses to questions on knowledge and practice of home management of childhood diarrhoea. The highest scored knowledge based question was the awareness of use of ORS in the home management of diarrhoea (100%) while the lowest scored was the knowledge of correct amount of ORS to be given after each purging (26.11%). The highest scored practice questions were hand washing after cleaning child's faeces and after self

use of the toilet (100%) while the lowest scored was the use of recommended homemade fluid in the home management of diarrhoea (14.72%).

Five (1.39%) of the 360 respondents scored the maximum of 11 out of 11 points for the knowledge based questions. Six (1.67%) of the 360 respondents scored the maximum of 11 out of 11 points for the practice based questions. Of the 360 mothers, 164 (45.55%) had a good level of knowledge, while 122 (33.89%) had good level of practice (Table 4).

Table 5 shows the relationship between the level of knowledge and some sociodemographic characteristics of the respondents. A higher knowledge score was associated with mother's age, educational level and occupation and father's educational level, occupation and income. All were statistically significant with $p < 0.001$.

Table 6 shows the relationship of level of practice with sociodemographic characteristics. A higher practice score was significantly ($p < 0.001$) associated with the mother's age, educational level, occupation, father's educational level, occupation and income.

Table 7 shows the logistic regression analysis of various variables relating to the level of knowledge and practice of home management of diarrhoea. After adjusting for other factors, mother's age was significantly associated with level of knowledge ($p = 0.003$) and mother's educational level significantly influenced both level of knowledge ($p = 0.001$) and practice ($p = 0.002$) of the home management of diarrhoea.

Table 1: Educational status of mothers

Educational status	Frequency	Percentage
No education	56	15.56
Primary incomplete	107	29.72
Primary complete*	97	26.94
Secondary incomplete	71	19.72
Secondary complete** or higher	29	8.06
Total	360	100.00

* Primary complete is defined as completing grade 5¹⁶.

** Secondary complete is defined as completing grade 10¹⁶.

Table 2: Knowledge based responses to home management and prevention of diarrhoea

Knowledge -based question	Yes N (%)	No N (%)
Cause of diarrhoea	265 (73.61)	95 (26.39)
Awareness of use of ORS in diarrhoea management	360 (100)	0 (00)
Function of ORS	112 (31.11)	248 (68.89)
Correct knowledge of preparation of ORS	321 (89.17)	39 (10.83)
Correct knowledge of preservation of ORS	111 (30.83)	249 (69.17)
Correct knowledge of amount of ORS to be given after each purging	94 (26.11)	266 (73.89)
Correct knowledge of use of increased fluid during diarrhoea	96 (26.67)	264 (73.33)
Correct knowledge of continued feeding during diarrhoea	131 (36.39)	229 (63.61)
Correct knowledge of use of recommended homemade fluid in the home management of diarrhoea	256 (71.11)	104 (28.89)
Awareness of use of zinc in diarrhoea management	141 (39.17)	219 (60.83)
Awareness of abstinence from drugs other than ORS and zinc during diarrhoea	118 (32.78)	242 (67.22)

Table 3: Practice based responses to home management and prevention of diarrhoea

Practice-based question	Yes N (%)	No N (%)
Use of ORS in diarrhoea management	320(88.89)	40(11.11)
Correct preparation of ORS	191(53.06)	169(46.94)
Correct amount of ORS given after each purging	68(18.89)	292(81.11)
Use of increased fluid during diarrhoea	75(20.83)	285(79.17)
Continued feeding during diarrhoea	69 (19.17)	291(80.83)
Use of recommended homemade fluid in the home management of diarrhoea	53(14.72)	307(85.25)
Use of zinc in diarrhoea management	128(35.56)	232(64.44)
Hand washing before feeding child	274(76.11)	86(23.89)
Hand washing after cleaning child's faeces	360(100)	0(00)
Hand washing after self use of the toilet	360(100)	0(00)
Use of drugs other than ORS and zinc during diarrhoea	225(62.50)	135(37.50)

Table 4: Scores of respondents for questions on knowledge and practice of diarrhoea home management

Score	Knowledge based response scores (n)	Percent (%)	Practice based response scores (n)	Percent (%)
0	0	0.00	0	0.00
1	0	0.00	0	0.00
2	67	18.61	0	0.00
3	21	5.83	106	29.44
4	80	22.22	71	19.72
5	28	7.77	61	16.94
6	21	5.83	30	8.33
7	34	9.44	26	7.22
8	47	13.05	29	8.05
9	32	8.88	15	4.16
10	25	6.94	16	4.44
11	5	1.38	6	1.66
Total	360	100	360	100

Table 5: Relationship between level of knowledge and some sociodemographic characteristics of the respondents

	Score			X ² for trend or X ²	p-value
	Good knowledge N(%)	Poor knowledge N (%)	Total N		
Age group of mothers					
15-19	13 (7.9)	5 (2.6)	18 (5.0)	25.797	<0.001 [§]
20-24	70 (42.7)	125 (63.8)	195 (54.2)		
25-29	54 (32.9)	56 (28.6)	110 (30.6)		
30-34	20 (12.2)	5 (2.6)	25 (6.9)		
35-39	7 (4.3)	5 (2.6)	12 (3.3)		
Mother's educational level					
No education	0 (0.0)	56 (28.6)	56 (15.6)	27.157	<0.001 [§]
Primary incomplete	22 (13.4)	85 (43.4)	107 (29.7)		
Primary complete*	52 (31.7)	45 (23.0)	97 (26.9)		
Secondary incomplete	61 (37.2)	10 (5.1)	71 (19.7)		
Secondary complete** or higher	29 (17.7)	0 (0.0)	29 (8.1)		
Father's educational level					
No education	0 (0.0)	29 (14.8)	29 (8.1)	27.896	<0.001 [§]
Primary incomplete	20 (12.2)	77 (39.3)	97 (26.9)		
Primary complete*	31 (18.9)	40 (20.4)	71 (19.7)		
Secondary incomplete	62 (37.8)	45 (23.0)	107 (29.7)		
Secondary complete** or higher	51 (31.1)	5 (2.6)	56 (15.6)		
Mother's occupation					
Housewife	144 (87.8)	186 (94.9)	330 (91.7)	32.76	<0.001 [§]
Service	20 (12.2%)	0 (0.0)	20 (5.6)		
Others	0 (0.0)	10 (5.1)	10 (2.8)		
Father's occupation					
Cultivator	25 (15.2)	71 (36.2)	96 (26.7)	66.501	<0.001 [§]
Business	42 (25.6)	5 (2.6)	47 (13.1)		
Day labourer	25 (15.2)	115 (58.7)	140 (38.9)		
Service	62 (37.8)	5 (2.6)	67 (18.6)		
Others	10 (6.1)	0 (0.0)	10 (2.8)		
Family income					
>100000 BDT/month	25 (15.2)	0 (0.0)	25 (6.9)	32.561	<0.001 [§]
15000-100000 BDT/month	68 (41.5)	5 (2.6)	73 (20.3)		
<15000 (BDT)/month,	71 (43.3)	191 (97.4)	262 (72.8)		

* Primary complete is defined as completing grade 5¹⁶.

** Secondary complete is defined as completing grade 10¹⁶.

[§] Significant ($p < 0.05$), BDT: Bangladeshi Taka

Table 6: Relationship between level of practice and some sociodemographic characteristics of the respondents

	Score			X ² for trend or X ²	p-value
	Good practice N (%)	Poor practice N (%)	Total N		
Age group of mothers					
15-19	13 (10.7)	5 (2.1)	18 (5.0)	39.352	<0.001 ^s
20-24	65 (53.3)	130 (54.6)	195 (54.2)		
25-29	26 (21.3)	84 (35.3)	110 (30.6)		
30-34	18 (14.8)	7 (2.9)	25 (6.9)		
35-39	0 (0.0)	12 (5.0)	12 (3.3)		
Mother's educational level					
No education	0 (0.0)	56 (23.5)	56 (15.6)	52.748	<0.001 ^s
Primary incomplete	11 (9.0)	96 (40.3)	107 (29.7)		
Primary complete [*]	27 (22.1)	70 (29.4)	97 (26.9)		
Secondary incomplete	55 (45.1)	16 (6.7)	71 (19.7)		
Secondary complete ^{**} or higher	29 (23.8)	0 (0.0)	29 (8.1)		
Father's educational level					
No education	0 (0.0)	29 (12.2)	29 (8.1)	48.248	<0.001 ^s
Primary incomplete	10 (8.2)	87 (36.6)	97 (26.9)		
Primary complete [*]	17 (13.9)	54 (22.7)	71 (19.7)		
Secondary incomplete	45 (36.9)	62 (26.1)	107 (29.7)		
Secondary complete ^{**} or higher	50 (41.0)	6 (2.5)	56 (15.6)		
Mother's occupation					
Housewife	102 (83.6)	228 (95.8)	330 (91.7)	45.450	<0.001 ^s
Service	20 (16.4)	0 (0.0)	20 (5.6)		
Others	0 (0.0)	10 (4.2)	10 (2.8)		
Father's occupation					
Cultivator	15 (12.3)	81 (34.0)	96 (26.7)	58.345	<0.001 ^s
Business	33 (27.0)	14 (5.9)	47 (13.1)		
Day labourer	12 (9.8)	128 (53.8)	140 (38.9)		
Service	52 (42.6)	15 (6.3)	67 (18.6)		
Others	10 (8.2)	0 (0.0)	10 (2.8)		
Family income					
>100000 BDT/month	25 (20.5)	0 (0.0)	25 (6.9)	49.569	<0.001 ^s
15000-100000 BDT/month	60 (49.2)	13 (5.5)	73 (20.3)		
<15000 (BDT)/month,	37 (30.3)	225 (94.5)	262 (72.8)		

¹ Primary complete is defined as completing grade 5¹⁶.² Secondary complete is defined as completing grade 10¹⁶.^s Significant ($p < 0.05$) BTD: Bangladeshi Taka

Table 7: Logistic regression analysis of factors relating to level of knowledge and practice of home management of diarrhoea

Variable	Knowledge Level			Practice Level		
	Odds ratio (95% CI)	Coefficient	P-value	Odds ratio (95% CI)	Coefficient	P-value
Mother's age	3.04 (1.645 – 7.227)	1.113	0.003 ^s	0.54 (0.240-1.732)	-0.617	0.08 ^{ns}
Mother's education	46.54 (15.466– 68.142)	3.840	0.001 ^s	30.50 (3.203-42.348)	3.418	0.002 ^s
Father's education	0.255 (0.036-1.197)	-1.365	0.12 ^{ns}	0.315(0.087-1.907)	-1.156	0.29 ^{ns}
Mother's occupation	1.08 (0.087-2.969)	0.079	0.95 ^{ns}	0.408 (0.037-2.726)	-0.896	0.26 ^{ns}
Father's occupation	0.022 (0.010-0.891)	-3.797	0.96 ^{ns}	0.139 (0.011-0.920)	-1.975	0.94 ^{ns}
Family income	3.44 (0.840-4.201)	1.236	0.06 ^{ns}	2.63 (0.720-5.210)	0.967	0.08 ^{ns}

^s Significant ($p < 0.05$), ^{ns} Not significant ($p > 0.05$)

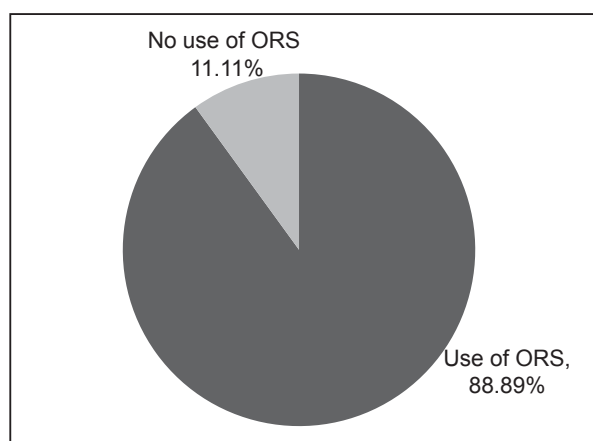


Fig. 1: Pie diagram showing use of ORS by mothers at home

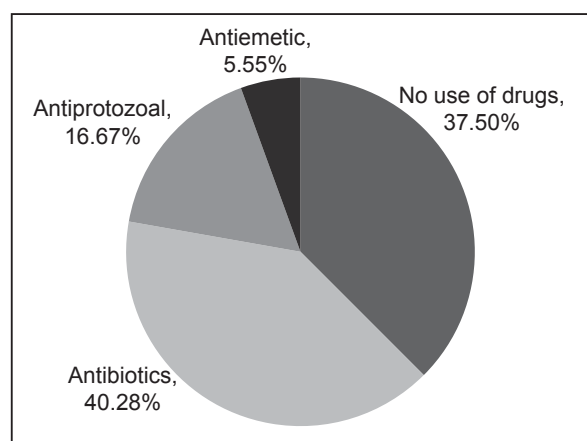


Fig. 2: Pie diagram showing use of antibiotics, antiprotozoal and antiemetic by mothers at home

Discussion

The present study has shown a generally low level of knowledge and inappropriate practices among mothers on different aspects of the home management of childhood diarrhoea. The high awareness (100% of mothers) of the use of ORS in the home management of diarrhoea reported in this study is similar to findings noted in other studies^{17,18,19}. In this study, 320 (88.88%) mothers had administered ORS to their children with diarrhoea prior to presentation. A comprehensive study conducted in India demonstrated that 63% of Indian mothers were aware of ORS whereas only 27% of them took advantage of it for their children.¹⁷ These studies suggest a profound lack between the cognition of ORS and its utilization. Thus, a superficial understanding of ORS is not enough and it requires consistent efforts to emphasize on importance of ORS in resolving dehydration during diarrhoea, particularly in children; since this group of age is more likely to be dehydrated quickly²⁰.

Regarding preparation of ORS it was observed that 321 (89.17%) mothers had adequate knowledge of the correct preparation of ORS but it was observed that 191 (53.06%) mothers correctly prepared the ORS. The mothers do not have instruments to measure water accurately. Furthermore they are worried the ORS will go to waste if they make the whole sachet. This is lower than the findings of a study by Taha, in which 64.00% of mothers and study done by Mohsin et al. 76.00% of mothers correctly prepared ORS^{6,21}. This unfortunate practice by home caregivers can result in either hypotonic or hypertonic dehydration in children receiving these incorrectly prepared ORS mixtures, leading to increased morbidity and mortality²².

In the present study, 265 (73.61%) mothers stated their children's diarrhoea incidence was due to contaminated food and water. In a similar study in Iran 52.00% of mothers correctly identified the cause of diarrhoea²³. However, similar study in Nigeria revealed that 35.00% of mothers were aware of contaminated

food and water as an etiologic agent of diarrhoea¹⁷. It however contrasts with the findings of a study by Uchendu et al. where 52.60% of caregivers perceived tooth eruption to be a major cause of diarrhoea²⁴. The difference observed between the studies may be related to the general perception of diarrhoea among caregivers in the specific areas. Health care workers provide basic health education including diarrhoeal cause and management at grass root level in Bangladesh.

In addition to ORT, the WHO recommends Zinc supplementation for the treatment of diarrhoea²⁵. In the study 141(39.16%) mothers were aware of the use of zinc for diarrhoea management. This finding is different from earlier studies in Uganda, and India where 17% and less than 1% of caregivers respectively, were aware of its use^{26,27}. The actual use of zinc for the treatment of diarrhoea in this study was 128 (35.56%) which is also much higher than findings of the above mentioned studies. This is due to education provided by health workers in Bangladesh.

Regarding the use of drugs, other than zinc and ORS, it was observed that drugs were given in 225 (62.50%) patients, either alone or in combination with ORS and most of the drugs used were antibiotics. Mohsin et al. found that drugs were given in 79.00% of patients, either alone or in combination with ORS which is much higher than study findings⁶. McLennan et al. observed that 73.00% of the caregivers recommended the use of antibiotics for treatment of their children with diarrhoea²⁸. The high popularity of the use of drugs such as antibiotics and anti diarrhoeal agents in children with diarrhoea has been reported by other studies^{29,30}. In Bangladesh, antibiotics can be procured without a doctor's prescription. This practice for the home treatment of diarrhoea by caregivers can lead to wide spread antibiotic resistance.

Regarding feeding during diarrhoea only 69 (19.17%) mothers continued feeding properly. Okoh et al. found that 93.60% caregivers continued feeding during diarrhoea⁹. Withholding of food by a caregiver and failure to compensate for decreased food intake by increasing feeding during convalescence are major contributors to the adverse nutritional outcomes of diarrhoea. The belief of resting the gut during diarrhoea is based on the idea that feeding could enhance the passage of frequent watery stool, thus increasing the severity of diarrhoea.

Concerning hand washing in the prevention of diarrhoea, 100% of the mothers in this study admitted

to always washing their hands after visiting the toilet and after cleaning child's faeces and 274 (76.11%) mothers used to wash their hands before feeding child. Okoh et al. found that 86.60% of caregivers washing their hands after using the toilet, 82.20% after cleaning child's faeces and 82.20% before feeding their child⁹.

Overall, there was a low level of knowledge and awareness of the home management of diarrhoea among respondents in this study, with 164 (45.55%) mothers having a good level of knowledge. Okoh et al. found that 29.30% of the caregivers had good knowledge of the home management of diarrhoea⁹. Ghasemi et al. found that 28.80% of the caregivers had good knowledge of the home management of diarrhoea³¹. Khalili et al. however reported a much lower level of knowledge of caregivers (3.7%) compared to the present study²³. There was also a low level of practices in the home management of diarrhoea among respondents in this study, with 122(33.89%) having a good level of practice. Okoh et al. found that 33.80% of the caregivers had good practices in the home management of diarrhoea⁹. Khalili et al. found that 56% of maternal practice was moderate and 41.7% had a weak performance and others practiced appropriately²³. The methodology of the present study however differed from the studies by Okoh et al. Ghasemi et al. and Khalili et al^{9,23,31}. Okoh et al. assessed both knowledge and practice using 8 questions for knowledge and 10 questions for practice, Ghasemi et al. assessed only knowledge of diarrhoea management using a 22 item questionnaire and Khalili et al. assessed both knowledge and practice using 10 questions each for knowledge and practice while the present study assessed both knowledge and practice using 11 questions for both knowledge and practice^{9,23,31}. The significant association between mothers level of education and the level of knowledge and practice of the home management of diarrhoea observed in the present study were also observed in other studies^{9,23,28,31}.

Conclusion

Home management of diarrhoea was grossly inadequate in terms of method of preparation and amount of administration of ORS, use of increased fluid and continued feeding. Despite the recommendation by WHO for limited use of drugs in selected cases, they are being used randomly. Awareness and use of zinc for diarrhoea management were very low. The level of knowledge and practice were significantly associated with the level of education of the mothers. We recommend more health campaigns and a wider

dissemination of information in hospitals, via the media and in communities, on home management of diarrhoea so as to increase awareness among caregivers and ultimately reduce the morbidity and mortality rate from diarrhoeal diseases among children.

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