

Maternal Knowledge and Practices for Prevention of Acute Diarrheal Diseases in Children under 5 years of age

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Abstract

Background: Diarrhea is the second major cause of mortality in children worldwide. Timely interventions by caregivers who are mainly mothers, can contribute towards a favorable prognosis of this condition in children.

Aim: The purpose of conducting this study was to assess maternal knowledge and the practices regarding prevention of diarrheal diseases in children under the age of 5 years.

Setting: This study was carried out in 3 hospitals at Lahore, including Farooq Hospital Westwood Branch, Farooq Hospital Iqbal town Branch and Akhtar Saeed Trust Teaching Hospital, Lahore.

Methods: A cross-sectional study was conducted from January to July 2020 and a convenience sampling technique was used for data collection. Data was collected from 158 mothers of children under 5 years of age by using a self-structured, pre-tested questionnaire. Chi square test was applied and p-value <0.05 was taken as significant.

Results: A total of 158 mothers responded to the study questionnaire; mean age of the participants was 28.4+ 7.6 years, 22.8% were illiterate, 84.2% were housewives, and 37.4% had income more than 31000 rupees/month. The majority (43.1%) had 'poor' knowledge, 24% had 'poor' attitudes and practices while 12% had better practices. Significant associations were observed between mother's knowledge with education (p-value=0.004), income (p-value=0.001), frequency of diarrhea in a child (p-value=0.053) and practices with education (p-value =0.039).

Conclusion: This study showed the direct relationship between mother's literacy level and family income with better knowledge and feeding practices of children regarding prevention of diarrhea. It has highlighted the role of mothers in the management of acute diarrheal diseases.

Keywords: maternal knowledge, practices, prevention, acute diarrheal diseases, children under 5 years of age.

Introduction

Diarrheal diseases prevail as the major cause of morbidity and mortality in children in developing countries like Pakistan.¹ Most cases of diarrhea are pathogen mediated and the most commonly implicated pathogen in children is Rotavirus which is accountable for almost one-

third of cases which are serious enough to lead to hospitalizations and around 800,000 average deaths per year.² In Pakistan, the predisposing factors attributed to diarrheal disease include malnutrition, poor socioeconomic conditions, poor personal hygiene and unsafe drinking water supply.³

Diarrheal diseases affect 1.5 million people each year around the world including 361,000 children under the age of 5 especially in developing countries.⁴ In Pakistan, the number of children under the age of 5 years are estimated to be 24 million and each child, on average, gets a total of 3 or 4 episodes of diarrhea each year, giving rise to 120 million episodes of diarrhea each year.⁵ In 2013, prevalence of acute diarrheal disease in Pakistan in children under age 5 was estimated to be 29.7%, whereas deaths due to diarrhea and its consequences in under 5 children in Pakistan were reported to be one in every 11 (9.1%).^{6,7} Similar statistics were reported in India where the annual death rate due to diarrheal diseases in children under 5 was estimated to be around 212,000.⁸

WHO launched a program for the control of diarrheal disease in 1978 to reduce diarrhea related morbidity and mortality.⁹ The program developed special guidelines for management of diarrhea in children with particular emphasis on oral rehydration therapy, appropriate use of drugs, continued feeding during diarrhea and parental education regarding prevention and management of diarrhea.⁹ Timely treatment with Oral Rehydration Salt (ORS) has reduced mortality associated with diarrheal disease.¹⁰ Despite the significance and convenience of Oral Rehydration Therapy (ORT), its use remains low and only 44% of children suffering from diarrhea receive this therapy.¹¹

Diarrheal disease is not lethal on its own. It is due to improper practices of the ones who take care of neonates, especially the mothers, which leads to severe dehydration and death. In a study conducted at Ethiopia 69.9% mothers demonstrated insufficient practices on managing diarrheal disease at home.¹² Another research conducted at urban slums of Karachi showed that adequate practices for diarrhea prevention and management significantly reduced diarrhea episodes among children.¹³

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Since mothers are the primary caregivers of their children, maternal knowledge and perception regarding the etiology, consequences and management of diarrhea with reference to ORS therapy, use of antibiotics, personal hygiene and feeding practices are important determinants of the course of diarrheal disease in their children. The objective of this study was to assess maternal knowledge and practices related to the cause, sign/symptoms and complications of acute diarrheal disease and to assess strategies and management plans employed by mothers for the control and prevention of acute diarrheal disease in their children under 5 years of age.

Materials & Methods

Study Design: A cross-sectional observational study was conducted to assess maternal knowledge and practices related to acute diarrheal diseases in their children.

Setting: After taking approval from IRB of Akhtar Saeed Medical & Dental College, this study was carried out from January 2020 to July 2020 in Farooq Hospital Westwood Branch, Farooq Hospital Iqbal town Branch and Akhtar Saeed Trust Teaching Hospital, EME, Lahore.

Study population, sample size and approach to sampling: A non-probability type of convenience sampling technique was used for data collection. Sample size of 158 participants was calculated by taking prevalence of 29.7% with WHO sample size calculator.

Data collection: Data was collected by using a self-structured pre-tested questionnaire (Cronbach alpha = 0.74). Questions were based on questions asked in previous studies. 10, 14 Mothers of children under 5 years of age and those who were willing to participate were included in this study.

Data analysis: Data was entered into SPSS 23 for analysis of results. Mean and standard deviation was calculated for quantitative variables while frequencies and proportion were calculated for qualitative variables. The analyzed data was presented in form of frequency tables. Univariate and bivariate analysis was done. Chi square test was applied to find the association between socio-demographic variables and other variables and p-value of <0.05 was taken as significant. There were 13 questions for knowledge and 10 questions were formulated to assess attitudes and for practices of mothers. Each question was given a score of one to three points, depending on the number of multiple choices. For the questions on knowledge, there were 13 points and the grade of knowledge for each level of score was:

- < 6 points = Poor
- 6-8 points = Satisfactory
- > 8 points = Good

For the questions on attitude and practices, there were 10 points and were graded as poor, satisfactory and good based on the total scores. A score less than 5 was labeled 'poor', a score between 5-7 was labeled 'satisfactory' while a score above 8 was labeled 'good'.

Ethical considerations: Data was collected after taking approval (IRB Number M-19/041/-CM) from Institutional Review Board of Akhtar Saeed Medical and Dental College, Lahore. Study par-

ticipants were interviewed after obtaining an informed consent and their confidentiality was highly maintained during and after the study.\

Results

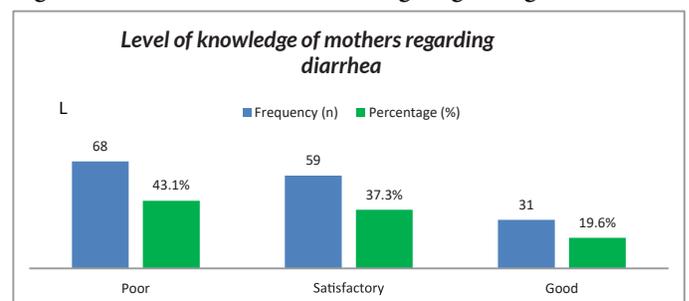
Table 1: Socio-demographic Profile: Knowledge of diarrhea

Age of mother in years	Frequency(n=158)	Percentage
<20	13	8.2
21-30	83	52.5
31-40	58	36.7
Above 40	4	2.5
Mother's educational status Frequency Percentage		
Illiterate	36	22.8
Primary	32	20.2
Secondary and above	90	57
Mother's job status Frequency Percentage		
Housewife	133	84.2
Employed	25	15.8
Total family income/Month in rupees Frequency Percentage		
<10,000	15	9.5
10,001-20000	38	24.1
20,001-30,000	46	29.1
Above 30,000	59	37.3

Knowledge of diarrhea

Out of 158 mothers, 123 (77.8%) gave a correct definition of diarrhea and 97(61.4%) knew about correct causes of diarrhea. 16(10%) mothers mentioned dry skin, 26 (16.5%) sunken eyes, 29 (18.4%) weight loss and 53(33.5%) mothers mentioned marked thirst as the common signs of dehydration. Out of total, 100(63.3%) mothers knew about weaning and 82(51.9%) mothers knew about prevention of diarrhea. 115(72.8%) mothers knew about Oral Rehydration Salt (ORS) and 83(52.5%) mothers knew that ORS was used for prevention of diarrhea. Whereas, 69(43.7%) mothers knew how to make ORS at home and 87(55.1%) knew that prepared ORS is usable for 24 hours.

Figure 1: Mother's level of knowledge regarding diarrhea



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Attitude and practices regarding prevention of diarrhea

The results showed that 106 (67%) children were completely vaccinated and 87 (55%) mothers had got their children vaccinated against Rota virus. Out of total 158, 123(77.9%) mothers preferred to seek help from a health center or a hospital when their child got sick. 138(87%) mothers out of total, breastfed their child for more than 6 months. However, among the rest of 20(13%) mothers whose children were bottle-fed, only 9(45%) washed the bottles regularly. The results revealed that 123 (77.8%) mothers out of total, used boiled or bottled water while 35 (22%) used tap water to feed their child. Out of total, 121 (76.6%) mothers continued breastfeeding their child during diarrhea and 90 (57%) mothers gave more fluid to their child during diarrhea. 124 (78.5%) mothers out of 158, started weaning in their children at 6 months, 24 (15.2%) at one year and 10 (6.3%) at 1.5 years of age. However, 116 (73.4%) mothers used homemade food while 42 (26.6%) opted for using commercially available weaning foods. Out of the total respondents, 50 (31.6%) washed their hands before food preparation, 23 (14.6%) before feeding children, 73 (46.2%) after defecation while 12 (7.6%) mothers washed their hands after attending to a child who had defecated.

Figure 2: Mother’s level of attitude and practices regarding prevention of diarrhea

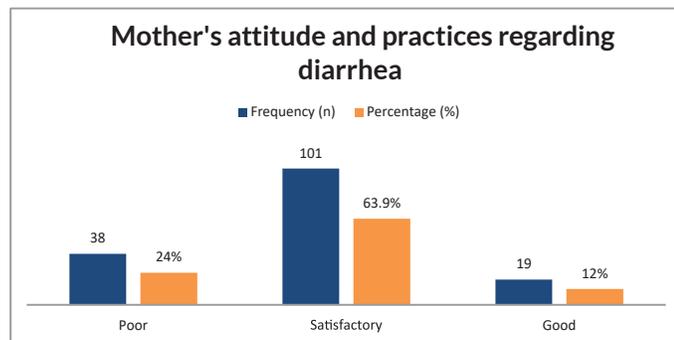


Table 2 shows a significant association between knowledge and level of education (p-value=0.004). Illiterate mothers display poor knowledge in comparison to the ones with secondary education or above. A significant association between knowledge and income was also observed (p-value=0.001) which reveals that family income also affects the level of awareness regarding prevention of diarrhea among mothers.

Table 2: Bivariate analysis of level of mother’s knowledge about diarrhea with education and family income

Table 3 showed that illiterate mothers had poor attitude and practices towards diarrhea as compared to those with secondary education (p-value=0.039). This implies that level of education does improve mother’s practice to prevent diarrhea in a child.

Table 3: Bivariate analysis of mother’s attitude and practices regarding diarrhea with education and family income

Table 4 showed a significant association between frequency and prevention of diarrhea with mother’s education. Frequency of diarrheal episodes was more in children of mothers with poor knowledge (p-value=0.053). Mothers with poor knowledge did not have any idea about prevention of diarrhea in a child (p-value=0.000).

Table 4: Bivariate analysis of frequency and prevention of diarrhea with mother’s level of knowledge

1. Education level	Good	Satisfactory	Poor	Total (n=158)	p-value
Illiterate	8(22.3%)	11(30.5%)	17(47.2%)	36	0.004*
Primary	2(6.3%)	9(28.1%)	21(65.6%)	32	
Secondary and above	22(24.4%)	39(43.3%)	29(32.2%)	90	
2. Family income in rupees/month	Good	Satisfactory	Poor	Total (n=158)	p-value
≤10,000	1(6.6%)	4(26.7%)	10(66.7%)	15	0.001*
10,001-20,000	4(10.5%)	18(47.4%)	16(42.1%)	38	
20,001-30,000	12(26%)	12(26%)	22(48%)	46	
Above 30,000	15(25.4%)	25(42.4%)	19(32.2%)	59	

Discussion

Most of the mothers were aware about diarrheal diseases as 123 (77.8%) mothers responded that frequent passing of 3 or more watery stools is diarrhea while 23 (14.6%) mothers thought frequent passing of 3 or more non- watery stools is diarrhea. Research conducted in Ethiopia also showed that 273(92.5%) of mothers were able to correctly describe what diarrhea.11 Both

Variable	Mother’s attitude and practices			Total (n=158)	p-value
	Good	Satisfactory	Poor		
1. Education level	Good	Satisfactory	Poor	Total (n=158)	p-value
Illiterate	4(11.1%)	21(58.3%)	11(30.5%)	36	0.039*
Primary	1(3.1%)	18(56.3%)	13(40.6%)	32	
Secondary and above	14(15.5%)	62(68.9%)	14(15.6%)	90	
2. Family income in rupees/month	Good	Satisfactory	Poor	Total (n=158)	p-value
≤10,000	1(6.7%)	10(66.6%)	4(26.7%)	15	0.102
10,001-20,000	1(2.6%)	28(73.7%)	9(23.7%)	38	
20,001-30,000	10(21.7%)	26(56.6%)	10(21.7%)	46	
Above 30,000	8(13.6%)	37(62.7%)	14(23.7%)	59	

Studies showed appropriate knowledge of mothers regarding definition of diarrhea.

Among total participants, 60 (38%) thought that contaminated water and 37 (23.4%) believed that germs on hands were the main cause of diarrhea. This was quite similar to a study conducted in Rahimyar khan which showed that only 54 (34.11%) mothers thought that contaminated water was the cause of diarrhea.15 Majority of women (33.5%) expressed that, in their opinion, marked

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thirst was the symptom of dehydration while 34 (21.5%) mothers had no idea about signs of dehydration in children which in con-

Variable	Mother's level of knowledge (n=158)			p-value
	Good	Satisfactory	Poor	
1. Frequency of diarrhea				
Fortnightly	61	4	14	0.053*
Monthly	11	11	27	
After 6 months	13	31	18	
Yearly	2	3	8	
Total	32	59	67	
2. Prevention of diarrhea				
Yes	31	45	6	0.000*
No	11	4	61	
Total	32	59	67	

trast to a research conducted in Delhi, showed that 41 (32.8%) did not know about signs of dehydration.¹⁶ The difference can be explained on the basis of difference in literacy rate.

Immunization against Rota virus plays an important role in preventing attacks of diarrhea. In this study, 87 (55%) mothers had got their children vaccinated against Rota virus whereas in a study conducted at Peshawar, it was found that only 26% mother got their children vaccinated.¹⁷

According to our research, 49 (31%) of mothers took their children to primary health center and 115 (73%) of mothers were aware of ORS. A study conducted in Karachi showed that 91 (82.7%) mothers took their children to primary health centre for treatment of diarrhea.¹⁸ The difference in health seeking behavior may be attributed to availability of quality of health services in both areas.

Boiling the water kills bacteria and is a major preventive measure used in households for safe drinking water. This practice has significantly been adopted by many mothers. In our research, 82 (51.9%) mothers used boiled water for bottle feeding, on the other hand, in research conducted in Lahore in 2018, 84 (28%) mothers used boiled water for bottle feeding.¹⁹ This showed that maternal knowledge and practices have become better in last two years.

In this study, regular bottle washing was reported by 45% of mothers who bottle feed their children. About 52% mothers reported that they use boiled water, 26% used bottled water and 22% used tap water for infant feeding. Findings of a study conducted in Nepal showed that only 18.7% mother used boiled water while rest 81.3% used untreated water. Difference in socioeconomic status may explain this disparity.²⁰

In this survey, 121 (76%) mothers were aware of its importance and continued breast feeding their child during diarrhea whereas in a study conducted in India, 72% mothers out of 210, were

continuing breast feeding during diarrhea.²¹

Weaning is vital for the growth and development of infants and children. In this study, 63% mothers had knowledge about weaning and 78.5% started weaning at 6 months of age. Similar findings were revealed in study conducted in India showing satisfactory knowledge about weaning among 70% mothers.²² Majority of mothers (73%) informed that they used homemade weaning food. In a study conducted in Lahore, respondents described that homemade weaning foods are better than commercially available food.²³

Out of 158 mothers, 50 (31.6%) washed their hands before food preparation and 23 (14.6%) washed before feeding their children. The percentage was very low and it is evident that there is still a greater need to educate mothers regarding importance of hand washing before preparation and administration of food to their children. In similar research, conducted in Sindh, Pakistan showed that, 152 (33.4%) mothers washed their hands before preparing food and 67 (14.7%) before feeding children.⁹

Oral Rehydration Solution (ORS) is a fluid replacement therapy and the easiest way to prevent and treat dehydration during diarrhea. Among total participants, 72.8% mothers knew about ORS and about 52% knew about its mechanism of action. The knowledge of mothers was even higher in research conducted in Nigeria which showed 92.1% women knew about ORS and 51.4% knew about its mechanism of action as well.²⁴

In this study, 69 (43.7%) mothers knew how to make ORS at home. While another research conducted in India, showed that 342 (76%) mothers knew how to make ORS at home.²⁵ In another study conducted in Karachi, 75.5% of the mothers knew how to prepare ORS correctly.²⁶ Greater knowledge about ORS preparation can be explained on the basis of difference in literacy rate.

According to current study, 87 (55.1%) mothers knew that ORS remains usable for 24 hours after preparation while a study conducted in Ethiopia, showed that 255 (86.4%) mothers knew that ORS remains usable for 24 hours.¹¹ Hence it is mandatory to guide and give health education to mothers to discard a prepared ORS solution after 24 hours as it can become bacteriologically contaminated and administer a freshly prepared solution of ORS to the child.

Conclusion

This survey revealed that the knowledge of mothers regarding sign/symptoms, causes and home management of diarrhea was not satisfactory. They need more knowledge, better attitudes and practices in order to improve the prevention and management of their children's diarrhea. The associations between knowledge, attitudes and practices all indicate high need of literate mothers for improvement of child's health.

Recommendations

- Health education programs should be launched to control and prevent diarrheal diseases and to improve maternal knowledge regarding healthy weaning practices.
- Seminars should be arranged for the mothers especially among those with low income and low education to educate them about

the causes, danger signs and prevention of diarrhea.

- Electronic media should be efficiently utilized in this regard to impart knowledge about sanitary and hygienic practices and vaccination programs about diarrhea.
- Importance of breastfeeding to the children during diarrhea should be heavily emphasized among mothers.

Limitations of Study: The only limitation of this study is that it was conducted in private hospitals. It should be expanded and further conducted in government setup too.

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Conflict of interest

No conflict of interest to be declared by all authors.

Author's contributions

A.M.J. conceived the topic and designed methodology, I.M. supervised the project and gave final approval of manuscript, I.Q. analyzed the results and prepared the final manuscript, M.F.M.Y. wrote introduction, M.F.B.S. developed questionnaire, M.M. wrote discussion and S.M. verified the analytical methods.

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