



Study on Awareness of Diarrheal Disease Control Among Health Personnel and Mothers

Authors

Dr Theranirajan E¹, Dr Luke Ravi Chelliah^{2*}, Dr Karthick AR³, Dr Gangadharan S³

¹Professor, Department of Paediatrics, Govt. Vellore Medical College, Vellore

²Associate Professor, Department of Paediatrics, Govt. Vellore Medical College, Vellore

³Assistant Professor, Department of Paediatrics, Govt. Vellore Medical College, Vellore

Corresponding Author

Dr Luke Ravi Chelliah

Associate Professor, Department of Paediatrics, Govt. Vellore Medical College, Vellore

Ph: 9840177788, Email: drlukeravic@gmail.com

Abstract

Background: *Diarrhea remains a leading killer of young children, despite the availability of simple treatment solution. It accounts for 9% of all deaths among children under 5 years of age worldwide. Information on diarrheal diseases, its determinants, preventive and control strategies need periodic review for better planning and implementation of health services. It is essential for healthcare persons and mothers to have proper knowledge and attitude regarding advantages of colostrum, appropriate feeding practices during diarrheal illness, common dangerous cultural practices, and usage of ORS and implementation of hygienic practices.*

Objective: *This study was done to find out the awareness regarding different aspects of prevention, treatment of diarrheal diseases among mothers and health personnel.*

Method: *This study was done over a period of 6 months from January to June 2017. 316 persons including staff nurses, nursing assistants, social workers working in various departments of Government Vellore Medical College, Vellore and mothers of children admitted in Department of Paediatrics were randomly selected. A structured questionnaire was put forth to the study population with systematic interview approach without any prior guidance / advance intimation.*

Results: *Most of the mothers had different ideas in diarrhea treatment and prevention. Health personnel had better understanding of diarrheal disease.*

Conclusion: *Periodic assessment of both health personnel and community is needed to bridge the gap in awareness of diarrheal diseases. Health education should be structured to bridge this gap and there is a felt need to revamp the health personnel and mothers for improved health services.*

Keywords: *diarrhea, ORS.*

Introduction

India has made a steady progress in reducing under-5 mortality, with total deaths declining from 2.5 million in 2001 to 1.5 million in 2012⁽¹⁾.

Diarrhea remains a leading killer of young children, despite the availability of simple treatment solution. It accounts for 9% of all deaths among children under 5 years of age worldwide⁽²⁾.

Diarrhea is responsible for 13% of under-5 year deaths in India, killing an estimated 300,000 children each year⁽³⁾. Information on diarrheal diseases, its determinants, preventive and control strategies need to reviewed periodically for better planning and implementation of health services⁽⁴⁾. It is essential for healthcare persons and mothers to have proper knowledge and attitude regarding early initiation of breastfeeding, advantages of colostrum, appropriate feeding practices during diarrheal illness, common dangerous cultural practices, usage of ORS and implementation of hygienic practices.

Methods

This prospective observational study was done over a period of 6 months from January to June 2017. 316 persons including 200 mothers, 55 staff nurses, 10 social workers, 26 female (FNA) and 25 male (MNA) nursing assistants, working in Government Vellore Medical College, Vellore, were included in the study randomly. Questionnaire was prepared covering demographic data, awareness of prevention, steps taken during diarrheal illness and all aspects of ORS.

The answers were recorded on the spot in the questionnaire itself. It was dealt with systematic interview approach without any prior guidance / advance intimation to evaluate and assess the exact status of awareness without any bias. Educational status of mothers was defined as Educated: who had been to school at least for 5 years and could read and write

Observation

Among the study population, 203 had more than 2 children and 227 were having nuclear family. Majority of them had children with diarrheal episodes of 1-3 per year. Detailed observations are tabulated below.

Table 1. Demographic data of Study Group

Breakup of Study Group			
S. No	Study Group	n	%
1.	Mothers	200	63.3
2.	Staff Nurses	55	17.4
3.	Male Nursing Assistant	25	7.9
4.	Female Nursing Assistant	26	8.2
5.	Social Worker	10	3.2
Educational Status of Mothers			
1.	Educated	116	58
2.	Literate	37	18.5
3.	Illiterate	47	23.5

Table 2. Feeding during Diarrhea

	Mothers		Staff Nurses		MNAs		FNAs		Social Workers	
	n	%	n	%	n	%	n	%	n	%
Colostrum to the Newborn whether beneficial										
Yes	143	71.5%	55	100.0%	18	72.0%	25	96.2%	10	100.0%
No	18	9.0%	0	0.0%	1	4.0%	1	3.8%	0	0.0%
Don't Know	39	19.5%	0	0.0%	6	24.0%	0	0.0%	0	0.0%
Breastfeeding during diarrhea										
Yes	157	78.5%	53	96.4%	21	84.0%	12	46.2%	10	100.0%
No	27	13.5%	2	3.6%	4	16.0%	14	53.8%	0	0.0%
Don't Know	16	8.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Starvation during diarrhea										
No	172	86.0%	54	98.2%	24	96.0%	23	88.5%	10	100.0%
Yes	23	11.5%	1	1.8%	1	4.0%	3	11.5%	0	0.0%
Don't Know	5	2.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Table 3. Formula Feeds and Pacifiers

	Mothers		Staff Nurses		MNAs		FNAs		Social Workers	
	n	%	n	%	n	%	n	%	n	%
Formula feeds leading to diarrhea										
Yes	100	50.0%	42	76.4%	19	76.0%	17	65.4%	8	80.0%
No	59	29.5%	13	23.6%	5	20.0%	5	19.2%	2	20.0%
Don't Know	41	20.5%	0	0.0%	1	4.0%	4	15.4%	0	0.0%
Cause of diarrhea with formula feeds										
Because of cereal	26	26.0%	4	9.5%	10	52.6%	9	52.9%	1	12.5%
Water used	9	9.0%	6	14.3%	0	0.0%	2	11.8%	3	37.5%
Container used	24	24.0%	27	64.3%	9	47.4%	4	23.5%	4	50.0%
Don't know	41	41.0%	5	11.9%	0	0.0%	2	11.8%	0	0.0%
Mode of Feeding										
Cup & Spoon	60	30.0%	44	80.0%	12	48.0%	11	42.3%	10	100.0%
Paladai	77	38.5%	11	20.0%	12	48.0%	14	53.8%	0	0.0%
Bottle with nipple	61	30.5%	0	0.0%	1	4.0%	1	3.8%	0	0.0%
Don't know	2	1.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Recommending Pacifiers										
Soother	12	63.2%	2	22.2%	0	0.0%	0	0.0%	0	0.0%
Straw tumbler	3	15.8%	7	77.8%	0	0.0%	0	0.0%	0	0.0%
Don't know	4	21.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Reasons for not recommending pacifiers										
Infection	80	53.0%	44	95.7%	18	72.0%	13	59.1%	8	80.0%
Malocclusion	6	4.0%	1	2.2%	0	0.0%	1	4.5%	1	10.0%
Aerophagia	13	8.6%	1	2.2%	7	28.0%	0	0.0%	0	0.0%
Lip swelling	3	2.0%	0	0.0%	0	0.0%	5	22.7%	0	0.0%
Habituation	3	2.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Don't know	46	30.5%	0	0.0%	0	0.0%	3	13.6%	1	10.0%

Table 4. Prevention of Diarrhea

	Mothers		Staff Nurses		MNAs		FNAs		Social Workers	
	n	%	n	%	n	%	n	%	n	%
Prevention of Diarrhea by food covering										
Yes	173	86.5%	55	100.0%	25	100.0%	26	100.0%	10	100.0%
No	7	3.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Don't know	20	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Protection from diarrhea by hand washing										
Yes	183	91.5%	55	100.0%	25	100.0%	26	100.0%	10	100.0%
No	4	2.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Don't know	13	6.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Defecation Practice										
Separate Latrine	104	52.0%	51	92.7%	23	92.0%	24	92.3%	10	100.0%
Common latrine	21	10.5%	4	7.3%	2	8.0%	2	7.7%	0	0.0%
Open air defecation	75	37.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Table 5. Diarrheal episodes and Dehydration

	Mothers		Staff Nurses		MNAs		FNAs		Social Workers	
	n	%	n	%	n	%	n	%	n	%
No. of Diarrheal episodes within 1 year										
Nil	27	13.5%	33	60.0%	23	92.0%	6	23.1%	4	40.0%
1 – 3	88	44.0%	18	32.7%	0	0.0%	13	50.0%	5	50.0%
4 and above	85	42.5%	4	7.3%	2	8.0%	7	26.9%	1	10.0%
Cause for diarrhea and										
infestations	137	68.5%	50	90.9%	15	60.0%	18	69.2%	10	100.0%
Teeth eruption	36	18.0%	3	5.5%	9	36.0%	5	19.2%	0	0.0%
Superstitious belief	3	1.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mile stones	4	2.0%	1	1.8%	0	0.0%	1	3.8%	0	0.0%
Thumb sucking	1	0.5%	1	1.8%	1	4.0%	0	0.0%	0	0.0%
Don't know	19	9.5%	0	0.0%	0	0.0%	2	7.7%	0	0.0%
Danger signs of dehydration										
Sunken eye balls	67	33.5%	9	16.4%	0	0.0%	5	19.2%	3	30.0%
Reduced urine output	3	1.5%	2	3.6%	0	0.0%	0	0.0%	4	40.0%
Cold peripheries	6	3.0%	4	7.3%	0	0.0%	1	3.8%	0	0.0%
AF - depressed	4	2.0%	0	0.0%	0	0.0%	1	3.8%	0	0.0%
All	84	42.0%	40	72.7%	25	100.0%	18	69.2%	3	30.0%
Don't know	36	18.0%	0	0.0%	0	0.0%	1	3.8%	0	0.0%
Early features of dehydration										
Thirst	111	55.5%	46	83.6%	22	88.0%	23	88.5%	10	100.0%
Irritability	36	18.0%	7	12.7%	3	12.0%	0	0.0%	0	0.0%
Don't know	53	26.5%	2	3.6%	0	0.0%	3	11.5%	0	0.0%
Consultation of Doctor										
1-2 times	46	23.0%	25	45.5%	19	76.0%	13	50.0%	7	70.0%
3-5 times	98	49.0%	22	40.0%	5	20.0%	7	26.9%	3	30.0%
> 6 times	56	28.0%	8	14.5%	1	4.0%	6	23.1%	0	0.0%

Table 6. Treatment of Diarrhea and ORS

	Mothers		Staff Nurses		MNAs		FNAs		Social Workers	
	n	%	n	%	n	%	n	%	n	%
Home remedies or drugs										
No treatment	120	60.0%	14	25.5%	13	52.0%	7	26.9%	1	10.0%
SSS	37	18.5%	36	65.5%	11	44.0%	10	38.5%	8	80.0%
Omam water, vasambu, kashayam	20	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mandram, mudippu	16	8.0%	0	0.0%	1	4.0%	8	30.8%	0	0.0%
Medicine received from medical shop	7	3.5%	5	9.1%	0	0.0%	1	3.8%	1	10.0%
Awareness of ORS, SSS										
SSS	5	2.5%	4	7.3%	0	0.0%	2	7.7%	2	20.0%
WHO ORS	104	52.0%	47	85.5%	25	100.0%	24	92.3%	8	80.0%
Prepared ORS	7	3.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Rice based ORS	0	0.0%	4	7.3%	0	0.0%	0	0.0%	0	0.0%
Not aware of ORS	84	42.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
ORS advice given to others										
Yes	73	62.9%	55	100.0%	25	100.0%	26	100.0%	10	100.0%
No	43	37.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Preparation of ORS										
Rough idea	37	31.9%	3	5.5%	13	52.0%	12	46.2%	2	20.0%
1 tsp in t tumbler of water	45	38.8%	5	9.1%	5	20.0%	8	30.8%	0	0.0%
1 packet in 1 litre of water	24	20.7%	47	85.5%	7	28.0%	6	23.1%	8	80.0%
Don't know	10	8.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Administration of ORS										
Cup and spoon	96	82.8%	51	92.7%	24	96.0%	23	88.5%	10	100.0%
Paladai	15	12.9%	4	7.3%	1	4.0%	3	11.5%	0	0.0%
Bottle with nipple	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Don't know	5	4.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Contraindications for ORS										
Persistent vomiting	16	13.8%	29	52.7%	8	32.0%	12	46.2%	4	40.0%
Worsening of diarrhea	4	3.4%	1	1.8%	0	0.0%	2	7.7%	0	0.0%
Doctor's advice	11	9.5%	14	25.5%	0	0.0%	3	11.5%	3	30.0%
Refusal of ORS	1	0.9%	4	7.3%	0	0.0%	1	3.8%	3	30.0%
Don't know	84	72.4%	7	12.7%	17	68.0%	8	30.8%	0	0.0%

Discussion

One of the major impediments to successful control of diarrheal disease is the non-recognition of diarrhea as significant health problem. This cross sectional survey had revealed the existing awareness of diarrheal disease control among the mothers from various places around Vellore and health personnel who were working in Government Vellore Medical College, Vellore.

In this study, 58% mothers are educated and 23.5% are still illiterates. Most of the mothers (71.5%), MNAs (72%), FNAs (96.2%), all staff nurses and all social workers were aware of the benefits of the colostrum. S K Bhasin et al have observed similar incidence of awareness of colostrum among Anganwadi workers (82.5%)⁽⁵⁾. Most of the mothers (78.5%), staff nurses (96.4%), MNAs (84%) and all the social workers were aware that breastfeeding should be given during diarrhea. Previous studies done by A K Sinha et al, Kapoor et al and Kaur et al also showed that most of the mothers were in favor of continuing breastfeeding during diarrhea⁽⁶⁻⁸⁾. All the social workers and 86% of mothers were aware that the child should not be starved during the episodes of diarrhea.

Significant group of health personnel and 50% of mothers were aware that formula feeds could lead to diarrhea. The various reasons given by mothers and health professional for the diarrhea in formula fed children was ascribed to cereals, water used for preparation and the container itself. All the staff nurses, 96% MNAs, 96.1% FNAs and most of the mothers (68.5%) were aware of the mode of feeding with cup & spoon and paladai. This was in contrast to study by Sinha et al, wherein only

35% of rural and 45% of urban population knew about spoon feeding rather than bottle feeding. All the MNAs, FNAs, social workers, most of the mothers (92.5%) and staff nurses (83.7%) were aware that pacifiers should not be given to children. This was in contrary to an earlier study by Victoria et al. where most of the mothers often strongly stimulated infant to accept pacifiers⁽⁹⁾.

All the health personnel and most of the mothers (86.5%) were aware that diarrhea could be prevented by covering the food. Most of the mothers (91.5%) concurred that diarrhea could be prevented by hand washing before or earlier to feeding. The study by Sinha et al reiterated the same fact⁽⁶⁾.

All the MNAs, 42% mothers, 72.7% staff nurses, 69.2% FNAs and 30% of social workers were able to tell the danger signs of dehydration. But 33.5% of mothers, 16.4% staff nurses, 19.2% FNAs and 30% social workers were of the opinion that sunken eyeballs is the only danger sign of dehydration. Eighteen percent mothers were not aware of any of the danger signs. Sinha et al observed that majority of mothers knew only few signs of dehydration⁽⁶⁾. Anand et al observed that 64% of rural mothers were ignorant about danger signs at which child should be taken to health center⁽¹⁰⁾. Kaur et al reported that majority of mothers (54.1%) felt too sleepy was the danger sign. 41.6% of mothers felt more watery stools was the danger sign⁽⁸⁾.

Important Features compelling parents to seek medical advice were loss of weight, persistence of diarrhea and altered sensorium^(7,11). Most of the health personnel and 55.5% of mothers were aware that thirst was an early feature of

dehydration. In our study, nearly 40-45% of study group consulted doctor after 3-5 loose stools per day, whereas 28% mothers, 23.1% FNAs, 14.5% Staff nurses and 4% MNAs favored consulting doctor after six loose stools per day. Consultation of doctor even with three episodes of diarrhea should be stressed in health education. Home remedies were not given by 60% mothers, 52% MNAs, 25.5% staff nurses, 26.9% FNAs and 10% of social workers to their children during episodes of diarrhea. Few mothers (3.5%), staff nurses (9.1%), FNAs (3.8%) and social workers (10%) received medicines from medical shop without the consultation of doctor. Omamwater or vasambu or kashayam was given by 10% of mothers. Significant percentage of health personnel and 18.5% mothers treated their children with salt sugar solution (SSS). Rasania et al observed that nimbupani homemade fluid was given during diarrheal disease⁽¹²⁾. Srinivasa et al in Goa observed rice water as a common homemade fluid given during diarrhea⁽¹³⁾. Herbal remedies were the first line of treatment for diarrhea given by mothers in a study by Kaur et al⁽⁸⁾. Kumar et al found that half of all rural and urban mothers believed in trying home remedies as first step in the treatment of diarrhea⁽¹⁴⁾.

One of the major steps taken towards combating the morbidity and mortality due to diarrheal disease is oral rehydration therapy. This would require health education of both health personnel and community, particularly mothers to make effective use of oral rehydration solution in managing diarrhea. Forty two percent of mothers were still not aware of ORS in our study. Significant study population had used ORS and SSS during the episode of diarrhea. Even though 37.1% of mothers used ORS during the illness, still they had not given advice to the neighbors and others. 80% of social workers, 85.5% of staff nurses, 20.17% of mothers, 28% MNAs and 23.1% FNAs were aware of the correct preparation of ORS. Most of the study population administered ORS by cup & spoon and paladai. Only 4.3% mothers were not aware of the ideal

mode of administration. Majority of the mothers (72.4%), 68% MNAs, 30.8% FNAs and 12.7% staff nurses were not aware of the contraindications of ORS. But Patwari et al, Rasania et al, Chaturvedi et al and Datta et al found better knowledge regarding ORS in their study^(11,12,15,16). The lacuna in awareness of ORS among mothers and lack of knowledge in preparation and contraindications for its use among health personnel needs to be overcome with health education and training program.

Conclusion

Most of the mothers in the rural area of Vellore have different ideas and perceptions about diarrheal diseases. Structured health education program is the need of the hour to bridge the gap in the awareness of diarrheal diseases to enable prevention and appropriate management of diarrhea in the hospital and the community. There is still a felt need to strengthen the IEC (Information, Education and Communication) activities periodically for effective control of diarrheal diseases.

Acknowledgements

The authors express sincere thanks to all the participants for actively taking part in the study and expressing their views without any inhibitions.

Funding: None

Conflict of Interest: None

References

1. Bhan MK. Accelerated progress to reduce under-5 mortality in India. *Lancet Glob Health*. 2013 Oct;1(4):e172-173.
2. Diarrhoeal Disease [Internet]. UNICEF DATA. [cited 2017 Jul 27]. Available from: [//data.unicef.org/topic/child-health/diarrhoeal-disease/](http://data.unicef.org/topic/child-health/diarrhoeal-disease/)
3. Million Death Study Collaborators, Bassani DG, Kumar R, Awasthi S, Morris SK, Paul VK, et al. Causes of neonatal and child mortality in India: a nationally

- representative mortality survey. *Lancet Lond Engl.* 2010 Nov 27;376(9755):1853–60.
4. Lakshminarayanan S, Jayalakshmy R. Diarrheal diseases among children in India: Current scenario and future perspectives. *J Nat Sci Biol Med.* 2015;6(1):24–8.
 5. Bhasin SK, Kumar R, Singh S, Dubey KK, Kapil U. Knowledge and attitudes of Anganwadi workers about infant feeding in Delhi. *Indian Pediatr.* 1995 Mar;32(3):346–50.
 6. Sinha AK, Srivastava SP. Awareness of diarrheal disease control in rural and urban areas of Bihar. *Indian Pediatr.* 1993 Dec;30(12):1433–9.
 7. Kapoor P, Rajput VJ. Maternal knowledge, attitudes and practice in diarrhea. *Indian Pediatr.* 1993 Jan;30(1):85–8.
 8. Kaur A, Chowdhury S, Kumar R. Mothers' beliefs and practices regarding prevention and management of diarrheal diseases. *Indian Pediatr.* 1994 Jan;31(1):55–7.
 9. Victora CG, Behague DP, Barros FC, Olinto MTA, Weiderpass E. Pacifier Use and Short Breastfeeding Duration: Cause, Consequence, or Coincidence? *Pediatrics.* 1997 Mar 1;99(3):445–53.
 10. Anand K, Lobo J, Sundaram KR, Kapoor SK. Knowledge and practices regarding diarrhea in rural mothers of Haryana. *Indian Pediatr.* 1992 Jul;29(7):914–7.
 11. Datta T. Awareness about breastfeeding, immunisation and oral rehydration. *Indian Pediatr.* 1985;32(12):929–30.
 12. Rasanias SK, Gulati N, Sahgal K. Maternal beliefs regarding diet during acute diarrhea. <http://indianpediatrics.net> [Internet]. 1993 May 1 [cited 2017 Aug 3]; Available from:
 13. Srinivasa DK, Afonso E. Community perception and practices in childhood diarrhea. *Indian Pediatr.* 1983;20(11):859–64.
 14. Kumar V, Clements C, Marwah K, Diwedi P. Maternal beliefs regarding diet during acute diarrhea. *Indian J Pediatr.* 1981 Sep 1;48(5):599–603.
 15. Patwari AK, Anand V, Kumar H, Aneja S, Mullick D. Knowledge and perceptions of residents regarding case management of acute diarrhea. *Indian Pediatr.* 1991 Aug;28(8):887–92.
 16. Chaturvedi S, Sandhir M, Bajpai R. Compliance of mothers in home management of acute diarrhea. <http://indianpediatrics.net> [Internet]. 1996 Apr 1 [cited 2017 Aug 3]; Available from: <http://imsear.hellis.org/handle/123456789/11452>