

Treatment of diarrhea and its differentials among under-five children in Nepal

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ABSTRACT

Introduction: Diarrhea is a leading cause of mortality in under-five children in developing countries. The treatment of diarrhea is critical in reducing the mortality due to diarrhea. Since socio- demographic parameters play a very important role in the implementation of treatment, it is very crucial to take it into consideration while developing national level programs and policies.

Methods: The 2011 NDHS data was used in this study. Treatment of diarrhea using various methods were explored first followed by bivariate analysis of treatment of diarrhea with and without any methods as dependent variable and socio-demographic variables of the mother and children as independent variables. Finally, multivariate logistic regression analysis was used to find the independent association of independent variable/s with the dependent variable.

Results: Bivariate analysis showed significant association of children's age and sex, bloody diarrhea, wealth quintiles and ethnicity of mothers on receiving any treatment methods for diarrhea in under-five children. Multivariate analysis revealed independent association of receiving any treatment for diarrhea for children less than six months, male child, women of richer household and dalit caste.

Conclusion: It is recommended that the policy makers should focus on female child less than 6 months and women belonging to the dalit caste and living in the poor households while planning for any programs related to treatment of diarrhea in the country.

Key words: Demographic and health survey (DHS), Diarrhea, Oral rehydration salt (ORS), Under-five children, Zinc

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INTRODUCTION

Diarrhea is defined as the passage of three or more loose or watery stools in 24-hour duration.¹ According to 2011 NDHS, 14 percent of all children under five had diarrhea with 2 percent having diarrhea with blood. Young age, poor nutritional status, dehydration, and lack of breastfeeding are the major risk factors for death from diarrhea.

Since socio- demographic parameters play a very important role in the implementation of treatment, it is very crucial to take it into consideration while developing national level programs and policies. Optimization of therapy is very crucial in reducing diarrhea related mortality and morbidity especially in children.

The main aim of this study is to analyze the various factors that affect the treatment of diarrhea in under five children and its association with sociodemographic parameters.

METHODS

The 2011 NDHS children's data set was used in this study, which was a nationally representative two-stage cluster survey. The percentage distribution of treatment of diarrhea by different methods was evaluated first using the 2011 NDHS data set. It was followed by bivariate analysis of treatment of diarrhea with/without any method and sociodemographic variables of mother and her children using chi square tests on children's raw database.

Multivariate logistic regression was used on the children's raw database to find the independent associations of treating diarrhea with/without any method and the selected socio-demographic variables of mothers and their children who suffered this condition in the last two weeks before the 2011 NDHS survey. Multicollinearity was assessed using variance inflation factor (VIF) among the independent variables.

A p-value less than 0.05 were taken as statistically significant result for the chi-square tests and multivariate logistic regression. VIF less than 2 was considered as absence of multicollinearity. All the data analysis was done using IBM SPSS V20.0 software.

RESULTS

In 2011 NDHS data, out of 5391 children, 4680 did not have diarrhea in the last two weeks prior to the survey. Of the 707 children who had diarrhea within last two weeks, three-fourth of children received treatment for this condition whereas about 1 out of 4 children did not receive any treatment.

About half of the children with diarrhea received ORS or increased fluid. About 1 in 20 received zinc with oral rehydration salt (ORS). The use of only zinc was found to be minimal. The percentage of children who received fluid from ORS packet was about 1 in 3 whereas those receiving

antibiotics, antimotility drugs or other pills were minimal. The result also showed a very low use of intravenous preparations in the treatment of diarrhea.

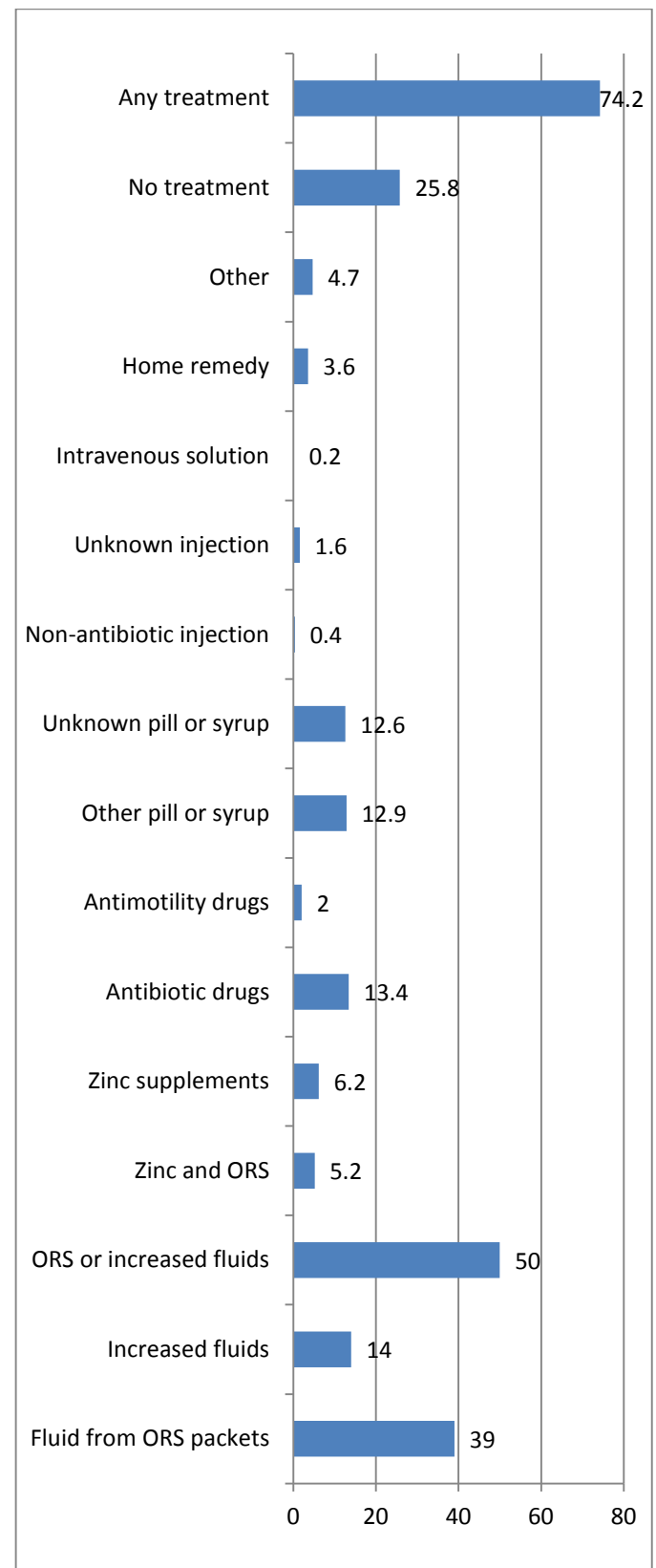


Figure 1: Use of different treatment methods among children with Diarrhea, Nepal 2011

Table 1: Percent distribution of receiving any treatment for diarrhea among children below 5 years by socio demographic variables

Background variables		Any treatment received				Background variables		Any treatment received								
	N	Yes (%)	No (%)	Chi-Square	P value		N	Yes (%)	No(%)	Chi-Square	P value					
Children's age in months						Mother's education										
<6	68	50.00	50.00	35.784	0.000	No education	345	72.80	27.20	4.047	0.256					
6-11	119	70.60	29.40			Primary	144	70.80	29.20							
12-23	239	82.40	17.60			Secondary	186	79.60	20.40							
24-35	144	69.40	30.60			Higher	32	75.00	25.00							
36-47	90	83.30	16.70			Wealth quintiles										
48-59	48	75.00	25.00			Poorest	165	66.70	33.30	12.238	0.016					
Children's sex						Poorer	162	75.90	24.10							
Male	408	79.70	20.30	14.713	0.000	Middle	181	74.60	25.40							
Female	299	66.90	33.10			Richer	116	84.50	15.50							
Bloody diarrhea						Richest	84	70.20	29.80							
No	602	72.80	27.20	4.771	0.029	Religion										
Yes	105	82.90	17.10	Hindu								575	75.80	24.20	4.473	0.34
Place of residence						Others						133	66.90	33.10		
Urban	65	80.00	20.00	1.235	0.266	Ethnicity						23.736	0.000			
Rural	642	73.70	26.30	Brahmin/Chhetri						179	78.80			21.20		
Eco-zones						Other terai caste								92	76.10	23.90
Mountain	54	68.50	31.50	4.088	0.130	Dalit								139	82.70	17.30
Hill	255	71.00	29.00			Janjati								237	63.30	36.70
Terai	398	77.10	22.90			Minorities								59	81.40	18.60
Dev-regions																
Eastern	138	74.60	25.40	2.161	0.706											
Central	244	70.90	29.10													
Western	150	76.00	24.00													
Mid-western	111	76.60	23.40													
Far-western	64	76.60	23.40													

About half of the children under 6 month and only 1 in four children above four years received treatment for diarrhea. Majority of children who received treatment were males. Most of the children with bloody diarrhea were treated. Majority of children falling under richer wealth quintile received treatment and about 4 in 5 children of dalit households received treatment for diarrhea.

Since p-values were < 0.05 for children's age, children's gender, and children's with/without bloody diarrhea, household wealth status, religion, ethnicity and receiving any treatment for diarrhea, they were dependent i.e. related with/without receiving any treatment for diarrhea. Mother's education, place of residence, eco-zones, and development regions was found to be independent i.e. unrelated with receiving any treatment for diarrhea. (Table 1)

Multicollinearity was not present among the independent variables as variance inflation factor were below 2 for all of

them (not shown). Thus, all the independent variables included in the bi-variate analysis were also included in the multi-variate analysis as well.

The chance of receiving any treatment for diarrhea was nearly 80% less for children below 6 months of age compared to children of 48-59 months after holding other variables constant. Similarly, male children were 84% more likely to receive any treatment for diarrhea compared to female children. Likewise, the probability of receiving any treatment for diarrhea was nearly 3.4 times more for children born in households in fourth wealth quintile (rich) compared to children of households with fifth wealth quintile (richest). Ironically, the chance of receiving treatment for diarrhea was found to be 2.3 times more for children of dalit households compared to bramhin/chettri. Rest of the variables did not have independent (statistically significant) association with treating diarrhea with any method.

Table 2: Association of receiving any treatment for diarrhea among children below 5 years by socio demographic variables

Background variables	N	odds ratio	P value	Background variables	N	odds ratio	P value
Children's age				Mother's education			
<6	68	0.198	0.000	No education	345	0.512	0.207
6-11	119	0.736	0.471	Primary	144	0.604	0.345
12-23	239	1.272	0.551	Secondary	186	1.014	0.979
24-35	144	0.696	0.378	Higher	32	reference	
36-47	90	1.476	0.408	Wealth quintiles			
48-59	48	reference		Poorest	165	1.335	0.494
Children's sex				Poorer	162	2.002	0.082
Female	299	reference		Middle	181	1.9	0.082
Male	408	1.843	0.001	Richer	116	3.389	0.003
Bloody diarrhea				Richest	84	reference	
No	602	reference		Religion			
Yes	105	1.771	0.062	Hindu	575	reference	
Place of residence				Others	133	0.778	0.444
Rural	642	reference		Ethnicity			
Urban	65	1.459	0.339	Brahmin/Chhetri	179	reference	
Eco-zones				Other terai caste	92	1.175	0.676
Mountain	54	0.69	0.347	Dalit	139	2.269	0.018
Hill	255	0.83	0.471	Janjati	237	0.582	0.058
Terai	398	reference		Minorities	59	1.619	0.399
Dev-regions							
Eastern	138	reference					
Central	244	0.968	0.907				
Western	150	1.231	0.499				
Mid-western	111	1.22	0.569				
Far-western	64	1.577	0.284				

DISCUSSION

The results showed that there is independent relation between children's age and gender, children's with/without bloody diarrhea, wealth status, mother's religion and ethnicity status with treatment received for diarrhea among the children.

The results showed that children above 6 months and below two years were more inclined to receiving treatment than the older ones which is similar to results from Sudan.² The chance of male child receiving treatment was greater than that for female child which is similar to other study.³ There is relation of receiving diarrhea treatment with socioeconomic status, for instance, children falling in richer wealth quintile are more likely to receiving treatment for their condition and it is similar for children of urban region. Other studies have also found similar results.^{4,5}

The study showed no relation with the mother's education with treatment. In contrary a study in India⁶ and Nigeria⁷ revealed significant association with the education of mother. Other studies revealed that the education of the mother was not related to the diarrhea management.^{8,9} It

seems that other factors such as the social class or family income might influence the mothers' knowledge more than just their own education. There was relation of ethnic status with receiving treatment for diarrhea with dalits and janjati having higher chance of receiving treatment. Other study in Nepal also found similar results relating to association of treatment of diarrhea with ethnicity.¹⁰ This might be due to the availability of free treatment facilities provided by the government under the CB-IMCI programs.

The type of treatment used is varied with ORS and zinc being the most used. Zinc for the treatment of diarrhea has been recommended by the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) since 2004,¹¹ yet access to this essential treatment remains limited. This might be because zinc is the new addition in the treatment of diarrhea and many are still unaware of its use. The primary goal of therapy in diarrhea is rehydration which is still recommended to be given through ORS. Receiving treatment is dependent on the type of diarrhea and there is higher chance if there is bloody diarrhea. If presence of blood in stool, it is suggestive of infection and antibiotics can be prescribed.¹²

The limitation of this study is that as seasonal variations play a role in the prevalence of diarrhea, the data may not reflect the situation throughout the year. The 2011 NDHS was fielded from February to June, whereas the period of high diarrhea prevalence is April to August so the data may not cover the high occurrence period.

CONCLUSION

Receiving any treatment for diarrhea was independently associated for children below six months of age, male child, women of richer household and dalit caste. Thus, it is recommended that the policy makers should focus on other areas while planning for any programs and policies related to treatment of diarrhea in the country. Even though ORS is the most recommended and effective treatment for treating diarrhea, zinc plays a vital role in prevention and decreasing the severity so needs to be promoted and antibiotics are reserved in case of severe or bloody diarrhea.

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