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Original Research Article

Assessment of Diarrhea Prevalence and Sociodemographic Factors among Under-Five Children in South Bihar Region: An Observational Study

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Abstract

Aim: The aim of this study was to assess diarrhea prevalence and sociodemographic factors among under-five children in South Bihar region.

Methods: This study was conducted in Department of Pediatrics, Jawahar Lal Nehru medical College and Hospital, Bhagalpur, Bihar, India for the period of 9 months. A community-based cross-sectional study design was employed to collect data from households to assess diarrhea prevalence and associated factors. All households were in South Bihar region with mothers/guardians having under-five children with diarrhea.

Results: A total of 500 under-five children and their mothers were enrolled during the study. Of these more than half, 57% (285/500), were males. Majority of mothers were in the age group of 25-34 years with mean age of 30.7%. Almost all respondents, married 93% (465/736), and house wives 86% (632/736).The educational status of mothers/guardians showed that 60% (300/500) of them were unable to read and write. The overall prevalence of diarrheal disease among under-five children was 21% (105/500). Of these, children who practice partial breast feeding were more infected with diarrheal disease, 18 (80/500), while 2% (10/500) of them who practice exclusive breastfeeding were less infected with diarrheal diseases.

Conclusion: The study revealed that childhood diarrhea remains an important health concern in the study area. The highest rate of the occurrence of diarrhea was significantly seen among children aged 0-1 year old. Occurrence of diarrhea was statistically associated with child age of less than or equal to one, educational status of mother/guardians and breast feeding.

Keywords: Diarrhoea, Socio-demographic factors, Environmental condition, Children under five.

Introduction

Childhood diarrhoea is a major public health problem in low- and middle-income countries, leading to high mortality in children under five. According to the World Health Organization (WHO), diarrhoeal disease is defined as the passage of three or more loose or liquid stools per day. [1] This preventable disease is the

second leading cause of death in children under five. Each year, nearly 1.7 billion cases of childhood diarrhoeal diseases have been reported, killed around 525,000 under-five children, accounting for 8% of all deaths worldwide.1 Most of the deaths from diarrhoea occur in children below 2 years of age. While the decrease in the episodes of childhood diarrhoea is evident globally over the past two decades, the prevalence of the disease remains at an alarming rate in many resource-poor settings where infants and children are still at risk of death and other complications such as malnutrition. [1,2]

Diarrhoeal diseases have a detrimental impact on child growth and cognitive development. [3] Diarrhoeal diseases are associated with an increased risk of malnutrition in children. [1] Approximately 90% of diarrhoeal diseases occur in sub-Saharan and South Asian countries. [4] Although India has made considerable achievements in reducing infant and child mortality over the past 20 years, the episodes of preventable diseases like diarrhea and pneumonia remain high. According to the National Family Health Survey (NFHS)-4, about 9% of under-five children had diarrhoea in the past 2 weeks preceding the survey during 2015–16. It is also notable that the prevalence of diarrhoea significantly varies across geographic regions of the country from as high as 13.1% in the central to as low as 4.2% in the northeast region. [5]

In India, pneumonia and diarrhoeal diseases accounted for 50% of all under-five deaths. [6] The government of India has initiated several interventions to reduce the burden of diarrheal diseases. In 1975, the Integrated Child Development Scheme (ICDS) was launched to reduce the incidence of childhood malnutrition, morbidity, and mortality by providing supplementary nutrition and routine vaccination. [7] Besides, Water, Sanitation and Hygiene (WASH) trails, National Diarrhoeal Disease Control Program and policies for child health and nutritional programs have been initiated to control the incidence of diarrhoea-related morbidity and mortality in children.

There are different factors associated with occurrence of diarrhea among children less than five years and these differ from place to place. A study carried out in Kenya showed that six factors were independently associated with diarrheal diseases, occupation of the parent/guardian, care taker not washing hands after changing napkins, child drinking untreated water from the river, child not exclusively breastfed, child not washing hands before eating and after visiting toilet. [8] In addition, household level water quality interventions can significantly reduce diarrheal diseases that are caused by pathogens. [9] To do so, regular and frequent assessment of the bacteriological quality of water is needed to get information about diarrheal diseases so as to apply sustainable monitoring system to control the water quality status of municipal and rural water distribution systems. [10]

The aim of this study was to assess diarrhea prevalence and sociodemographic factors among under-five children in South Bihar region.

Materials and Methods

This study was conducted in Department of Pediatrics, Jawahar Lal Nehru medical College and Hospital, Bhagalpur, Bihar, India for the period of 9 months. A community-based cross-sectional study design was employed to collect data from households to assess diarrhea prevalence and associated factors. All households were in South Bihar region with mothers/guardians having under-five children with diarrhea.

Inclusion Criteria: All mothers/guardians who have under-five children with diarrhea at selected households were included in the study.

Exclusion Criteria: (i) Children who were chronically ill and with persistent diarrhea for greater than two weeks were excluded.

(ii) Critically ill or suffering mothers or guardians of the index child were excluded, since it is unethical to take routine information from a suffering person or difficult to obtain complete information.

Variables of the Study

Dependent Variable: The dependent variable is diarrheal disease prevalence.

Independent Variables: The independent variables are sociodemographic characteristics (age, sex, address, educational status, occupation, family members), household size, parental education, maternal occupation, family size, maternal age, number of children under-five years of age, child's age, vaccination status, and breast feeding practice.

The data collection tool was structured interview questionnaire to be filled by data collector among randomly selected household to estimate the magnitude of diarrhea in under-five children.

Data Management and Quality Control

The questionnaire was prepared originally in English and translated into Hindi and back to English to keep the consistency of the questions by independent individuals. Training of the data collection team was made to insure the possible quality data. The principal investigator and supervisors checked and reviewed the filled questionnaires to ensure completeness and consistency of the information collected. Incorrectly filled or missed questionnaires were turned back to the data collector for correction in the next day.

Data Management and Analysis

All collected data was checked for completeness and reliability before entry into software. Data entry and cleaning was done using Epi Info version 3.5.3 computer software. Descriptive statistics of SPSS version 20 was used to summarize all the values of the variables. Pearson's x2 test and binary logistic regression with 95 % CI were computed as measures of association. To assess the association between the different predictor variables of diarrheal occurrence in under-five children with the dependent variables, first binary relationships between each independent variable and outcomes were investigated using a binary logistic regression model. All variables with P value less than 0.2 were included in the multiple logistic regression models, and P value of less than 0.05 was considered as statistically significant.

The purpose and importance of the study was explained to each study participant. To ensure confidentiality of participants' information, anonymous typing was applied whereby the name of the participant and any identifier of participants were not written on the questionnaire, and to keep the privacy during the interview, they were interviewed alone. Above all data was collected after full verbal consent was obtained from study participants. Children who have diarrhea during the interview were treated using ORS and zinc tablets and then sent to nearby hospital.

Results

Table 1: Sociodemographic characteristics of respondents among under-five children

Variables	Diarrhea (N = 500)		P value
	Yes (%)	No (%)	
Age group of index child			
0-1 year	35 (7)	90 (18)	
1-2 years	30 (6)	85 (17)	
2-3 years	25 (5)	90 (18)	0.001

3-4 years	10 (2)	80 (16)	
4-5 years	5 (1)	50 (10)	
Sex of index child			
Male	60 (12)	225 (45)	0.95
Female	45 (9)	170 (34)	
Relation of the respondent to the child			
Mother	90 (18)	365 (73)	
Father	6 (1.2)	35 (7)	0.25
Caretaker	4 (0.8)	5 (1)	
Age group of mother/caretaker			
15-24 years	25 (5)	90 (15)	
25-34 years	60 (12)	190 (38)	0.55
>35 years	20 (4)	130 (30)	
Marital status of mother/ guardian			
Married	100 (20)	365 (73)	0.045
Divorced	3 (0.6)	30 (6)	
Single	2 (0.4)	0	
Educational status of mother/guardian			
Illiterate	65 (13)	235 (47)	0.001
Read and write	10 (2)	65 (13)	
Grade 1-8	5 (1)	35 (7)	
Grade 9-12	10 (2)	10 (2)	
Greater than grade 12	15 (3)	50 (10)	
Occupation of mother			
Housewife	90 (18)	340 (68)	
Government employee	10 (2)	5 (1)	0.001
Others	5 (1)	50 (10)	
Current breastfeeding status			
Exclusive breastfeeding	10 (2)	40 (8)	0.001
Partial breastfeeding	90 (18)	170 (34)	
Not breastfeeding	5 (1)	185 (37)	
Duration of breastfeeding			
≤ 1 year	40 (8)	100 (20)	
1-2 years	45 (9)	170 (34)	0.35
>2 years	20 (4)	125 (25)	
Beginning age of supplementary feeding			
<6 months	10 (2)	25 (5)	
6-12 months	90 (18)	350 (70)	0.65
>12 months	5 (1)	20 (4)	
Measles vaccination status			
Yes	80 (16)	325 (65)	0.018
No	25 (5)	70 (14)	
Rota vaccination status			
Yes	70 (14)	245 (49)	0.30
No	35 (7)	150 (30)	

A total of 500 under-five children and their mothers were enrolled during the study. Of these more than half, 57% (285/500), were males. Majority of mothers were in the age group of 25-34 years with mean age of 30.7%. Almost all respondents, married 93% (465/736), and house wives 86% (632/736).The educational status of mothers/guardians showed that 60% (300/500) of them were unable to read and write. The overall prevalence of diarrheal disease among under-five children was 21% (105/500). Of these, children who practice partial breast feeding were more infected with diarrheal disease, 18 (80/500), while 2% (10/500) of them who practice exclusive breastfeeding were less infected with diarrheal diseases.

Discussion

Diarrhea is one of the water borne diseases which are reported as the leading cause of death in infants and children. [1] According to WHO, diarrhea is the passage of 3 or more times loose or liquid stools per day or more frequently than the normal for the individual. Globally, diarrheal disease remains one of the principal causes of morbidity and mortality in children. In the globe, under-five children experience on an average 3.2 episodes of diarrhea every year [12] and consequently 1.87 million children will die from dehydration associated with diarrheal disease. [13] In the developing countries, diarrheal disease among under-five children accounts for about 21% of all deaths. [14,15]

The overall prevalence of diarrhea in this study was 21%; this was in line with the study conducted in eastern Ethiopia, 22.5% [16,17] and Somalia region. However, it was lower than those reported in the studies conducted in Burundi rural areas, 32.6% [18]; nomadic population in Afar region, 26.1% [19]; ArbaMinch, Southern Nationalities, and Peoples' region, 30.5% [20]; and Jijiga, Somalia region 27.3%. [17] This might be due to the inclusion of only rural children and the difference in provision health service between rural and urban population. However the current finding was higher than the finding of the Ethiopian demographic and health survey 2016 (EDHS), in which the magnitude of diarrheal disease among children younger than 5 years old was 12% [21], study conducted in West Gojjam, 18% [22] and North Gondar Zone, Amhara region 15%. [23] The possible explanation for this difference could be the variation in the sociodemographic characteristics of the study subjects, socioeconomic development, and study periods. People's living style, behavioral change, and communication strategies of these areas could also contribute notably to such variations.

The children aged 0-1 year old were at high risk of developing diarrhea compared to children aged b/n 4-5 years old. This finding was in line with studies conducted in Arba Minch, southern Ethiopia [20], India [24], Sudan [25] and Thailand. [26] The high prevalence of diarrhea at this age could be due to the low immunity of children, introduction of contaminated weaning foods, and crawling starting at this age and the risk of ingesting contaminated foods and drinks.

The present study found that the odds of diarrheal diseases of children whose mothers/caretakers cannot read and write were higher than those of children whose mothers/ guardians had grade greater than 12 and above level of education. This is also similar to previous studies conducted in Jijiga, Somalia region [17]; Hadaleala district, Afar region, northeast Ethiopia [19]; Arba Minch, southern Ethiopia [20]; and Sheko district, southwest Ethiopia. [27] This may be due to the fact that education is likely to enhance household health and sanitation practices. Education can increase awareness about the transmission and prevention methods of diarrhea. It also encourages changes in behavior at the household level.

Findings of our study showed that diarrheal occurrence was associated with children that do not have breast feeding in their early age. This was also agreed with other reports from Gojjam, west Ethiopia, indicating that not breastfeeding resulted in an excess risk of diarrhea mortality in comparison to exclusive breastfeeding among infants aged 0-5 months and to any breastfeeding among children aged 6-23 months. [28,29,30]

Conclusion

The study revealed that childhood diarrhea remains an important health concern in the study area. The highest rate of the occurrence of diarrhea was significantly seen among children aged 0-1 year old. Occurrence of diarrhea was statistically associated with child age of less than or equal to one, educational status of mother/guardians and breast feeding. To minimize the magnitude childhood diarrhea, various designing and implementing strategies, such as health education, child care, early vaccination of children, and weaning practice, integrated with the existing national health extension are quite essential.

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