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Impact of Socio-Demographic Factors in Under-Five Children with Acute Diarrhea in Tertiary Care Hospital

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ABSTRACT

Objective: To determine the impact of socio-demographic factors linked to an increased incidence of acute diarrhea among children under five years of age. **Study Design:** Descriptive-Cross sectional study. **Settings:** This study was carried out at the Pediatric emergency department of Nishtar Hospital, Multan Pakistan. **Duration:** Six months From August 2022 to January 2023. **Methods:** After obtaining Ethical approval from the Institutional review board, a self-designed questionnaire was used to obtain information from parents/caregivers of 147 participants selected through a non-probability convenient sampling technique. Data entry and analysis were done using SPSS statistics 26. Results pertaining to rates were reported as frequencies and percentages. The Chi-square test was used to measure the association, and a factor was considered to be significant if its p-value was less than or equal to 0.05. **Results:** In the present study, the frequency of acute diarrhea among children was 87 (59.2%). Socio-demographic factors significantly associated with acute diarrhea were joint family system (p=0.01), incomplete EPI vaccination (p=0.00), lack of exclusive breastfeeding (p=0.01), previous history of diarrhea (p=0.04), poor sewerage system (p=0.00) and quality of drinking water (p=0.00). **Conclusion:** The possible reasons for diarrhea seem to be multifactorial, so a high-risk approach should be commenced to mitigate the issue of the lower health status of children, and the primary aim of policies should be the reduction of social, economic, educational, and health disparities within the country.

Keywords: *Acute diarrhea, Socio-demographic factors, Under five year's children.*

INTRODUCTION

Children in underdeveloped nations are disproportionately afflicted by diseases that are preventable and treatable with easy and low-cost measures. As a result, the children in these countries are ten times more plausibly to expire than the children in industrialized countries before reaching the age of five [1]Acute diarrhea is the onset of three or more loose or watery stools per day for a period of no more than 14 days and involves an abnormally frequent production of fluid stool or semi-solid materials from the intestine.[2] Every year, 3 episodes of diarrhea strike children all over the world [3], and as a sequel, 1.87 million children will die from diarrhea-related dehydration.[4] Diarrhea kills more than 90% of children under the age of five in low- and lower-middle-income countries, with South Asia and Sub-Saharan Africa (SSA) accounting for 88% of regional mortality in this age range.[5]

According to the World Health Organization's (WHO) Global Health Observatory data for 2017, Pakistan ranks 23rd (out of 194 countries) in terms of mortality in under 5 years children as a result of diarrheal diseases. Thus, diarrheal diseases killed 74 children in Pakistan for every 1000 live births annually.[6]Children with diarrhea are more likely to experience malnutrition because it reduces the absorption of vital nutrients.[7] In the first few years of life, it is responsible for 10–80% of the global growth retardation.[8] Additionally, it is linked to several issues

due to its detrimental impact on physical and cognitive development; it causes 72.8 million disabilities and adjusted life years, as well as wreaking havoc on families, finances and the healthcare system.[9]

Even though diarrhea-related mortality has been successfully reduced, the incidence and morbidity reductions have been assorted among areas and socioeconomic sectors.[10] In Pakistan, only a few research have looked into the link between socio-demographic characteristics and acute diarrhea in children under the age of five. This research is being carried out to fill the void in identifying variables associated with the occurrence of acute diarrhea in children. The findings will assist health planners in identifying priority areas for reducing the incidence of diarrhea among children.

METHODS

This study employed a descriptive cross-sectional study approach. It was conducted at the Pediatric department of the Nishtar Hospital Multan, Pakistan for Six months duration from August 2022 to January 2022. The sample was collected through non-probability convenient sampling. The sample size was estimated by using the WHO calculator by taking the prevalence of 10.7%[11] keeping the margin of error as 5% and using the confidence level of 95%; the estimated sample size came out to 147. The study participants under the age of 5 years who presented with three or more loose or watery stools per day for less than 14 days were included in the study. Any child suffering from chronic diarrhea or for more than 14 days and comorbid conditions were excluded from our study. After obtaining approval from the Institutional Ethical Committee with ref. No.13319/NMU, data was collected using a self-designed questionnaire. The questionnaire was explained in the local language, and information regarding socio-demographic factors, exclusive breastfeeding, EPI vaccination, sewerage system, source of drinking water, previous history of diarrhea and death of sibling from diarrhea was obtained. Consent was sought from caregivers/parents, respectively. The data was entered and analyzed using SPSS Statistics version 26. Descriptive analysis was applied to find out frequencies and percentages. Then chi-square test was applied, and socio-demographic factors were explored. The p-value ≤ 0.05 was considered as significant.

RESULTS

Out of a total of 147 children, 87(59.2%) presented with acute diarrhea. 64(43.5%) of children were below 1 year of age. In our research, the mean age of study participants was 1.89 ± 5.97. 91(61.9%) were male children and one hundred and ten 76(51.7%) were resident of urban areas. The majority of children, 93(63.3%), had a joint family system. Most of the children (78.2%) belong to low-monthly income families. One-third of mothers, 61(41.5%), had no education, and 72.9% of mothers did not practice exclusive breastfeeding.52.4% utilized unfiltered water resources .47.9% of participants' parents or caretakers stated that they did not complete vaccination according to the recommended time frame. Table 1 shows the details of these socio-demographic characteristics of study participants.

Table 1: Distribution and frequencies of socio-demographic factors in under 5 years children

Variables	Category	Frequency	Percentage
Age of child	<1 year	64	43.5%
	1-2 years	50	34.0%
	3-4 years	18	12.2%
	4-5 years	15	10.2%
Gender of child	Male	91	61.9%
	Female	56	38.1%
Residency	Urban	76	51.7%
	Rural	71	48.3%
Family system	Joint	94	63.9%
	Isolated	53	36.1%
Birth Order of Child	1st	43	29.3%
	2nd	41	27.9%
	3rd	24	16.3%
	4th	17	14.9%
	others	22	
Education of mother	Uneducated	61	41.5%
	Primary	31	21.1%
	Secondary	39	26.5%
	Higher	16	10.9%
Education of Father	Uneducated	72	49%
	Primary	33	22.4%
	Secondary	27	18.3%
	Higher	15	10.2%
Previous history of diarrhea	Yes	110	74.8%
	No	37	25.2%
Previous history of the death of siblings from diarrhea	Yes	14	9.5%
	No	133	90.5%
Age of Mother (Years)	< 20	53	36.1%
	20-40	83	56.5%
	41 & above	11	7.5%
Monthly income of the family (PKR)	<25000	115	78.2%
	25000-50000	27	18.4%
	50000-75000	3	2.0%
	>75000	2	1.4%
Ethnicity of child	Urdu	33	22.4%
	Punjabi	29	19.7%
	Saraiki	80	54.4%
	Pashto	3	2.0%
	Balochi	2	1.4%
Quality of drinking water	Boiled	14	9.5%
	Filtered	56	38.1%
	Unfiltered	77	52.4%
Exclusive breastfed	Yes	84	57.1%
	No	63	42.9%
Proper sewerage system for disposal of waste	Yes	84	57.1%
	No	63	42.9%
Complete Vaccination for EPI In time	Yes	88	59.9%
	No	59	40.1%

The chi-square test was applied to measure the association, and a factor was significant if its p-value was less than or equal to 0.05. Table 2 depicted a statistically significant association of acute diarrhea with exclusive breastfeeding, incomplete vaccination for the Expanded Program of Immunization (EPI), improper sewerage system for disposal of waste, joint family system, previous history of diarrhea and poor quality of drinking.

Table 2: Association of acute diarrhea with socio-demographic factors

Variables	Category	Diarrhea Present	Diarrhea Absent	p-value
Gender	Male Female	52 35	39 21	0.521
Age (Years)	<1 1-2 3-4 4-5	34 34 11 8	30 16 7 7	0.420
Residency	Rural Urban	44 43	32 28	0.742
Family System	Nuclear Joint	63 24	30 29	0.01
Education of mother	Uneducated Primary Secondary High	38 17 23 9	23 14 16 7	0.909
Age of Mother (Years)	<20 20-40 >41	27 52 8	26 31 3	0.254
Previous history of diarrhea	Yes No	73 14	38 22	0.04
Monthly income of Family	<25000 25000-50,000 >50,000	47 27 11 2	33 20 7 0	0.689
Exclusive Breastfeeding	Yes No	40 47	44 16	0.01
EPI Vaccination Completed in time	Yes No	41 46	48 12	0.00
Birth order of the child	1st 2nd 3rd 4th Others	25 27 14 10 11	18 14 10 7 11	0.440
Sewerage System	Yes No	30 57	54 6	0.00
Previous history of death of children<5 years due to diarrhea	Yes No	10 77	4 56	0.327
Quality of drinking water	Boiled Filtered Unfiltered	6 29 52	5 44 11	0.00

DISCUSSION

In children around the world, diarrhea is one of the leading causes of death. The disease that can be prevented and treated with easy, inexpensive steps disproportionately affects children in underdeveloped nations.[12] Our study showed that the frequency of acute diarrhea under five years was 59.2%. However, the low percentage of 38.9% was noted in the study performed in Bhawalpur.[13] This variability in prevalence in the same geographical region needs further investigation to explore multiple unknown factors.

In the current study, the exclusive breastfeeding reported was only 27.9%, and this factor was found to be significantly connected with acute diarrhea. This runs parallel to a study from Davidson and colleagues that demonstrates that children who are not exclusively breastfed have a higher risk of suffering from diarrhoea.[14] While the study conducted in Nepal showed that there was a link between suboptimal breastfeeding and higher odds of childhood diarrhoea.[15] This might be because those children with exclusive breastfeeding have a more stable gut bacterial taxa composition, thus reducing the incidence of diarrhoea.[16]

The current study revealed that the joint family system and acute diarrhea have a strong association. Overcrowding, an unclean environment, and inadequate childcare appear to be the likely causes of diarrhea in joint families. The results are contrary to those of another study from Bangladesh, where children from nuclear families have greater odds of developing diarrhea.[17]But a community-based survey in Maharashtra showed an increased prevalence of diarrhea in the joint family systems.[18]

Our study finds a statistically significant association between poor sewerage infrastructure and diarrhea in children under five. Breaking the chain of orofecal exposure transmission is crucial to prevent diarrheal diseases, but improved sanitation practices alone cannot do this.[19] In contrast, a local study done in Jamshoro finds no connection between diarrhea and better sanitation.[20]

We also noted that incomplete EPI vaccination in our study was statistically significant with acute diarrhea. This result contradicts a previous study from Pakistan that found no association between vaccination and diarrhoea.[20] However, a study disputes one by Gedamu G and colleagues, which found that children who did not receive a vaccination were more likely to experience diarrhea.[21]

Socioeconomic status and occupation were statistically insignificant in the present study. Our findings are supported by research by Godana W and colleagues in which they found no connection between occupation and monthly income and diarrhea in under-five-year children.[22]

Regarding maternal education, our study reveals that 10.9% of children belong to mothers with higher education; this finding is consistent with a study from Turkey in which higher maternal education is associated with a lower prevalence of diarrhea in young children.[23]

In the present study, the majority of participants were males. This finding is consistent with a Dhaka study that found that boys have greater rates of diarrhea than girls do (56.2% versus 43.8%), respectively.[24] However girls are more likely to contract diarrhea than males in some regions. This variation may be caused by a yet-unknown sex-based differential in the pathophysiological mechanism of diarrhoea.[25]

CONCLUSION

In this study, we looked into several socio-demographic variables that may have an impact on the occurrence of acute diarrhea. It was found that acute diarrhea increased in children belonging to the joint family system. In time, exclusive breastfeeding and EPI vaccination were found to have a protective role in preventing diarrhea. Previous history of diarrhea, living in an unsanitary environment and utilizing unfiltered drinking water sources were predominant causes of diarrhea in under five years children.

LIMITATIONS

Because it was a descriptive cross-sectional study, it was unable to establish a cause-and-effect relationship. Additionally, the study was carried out in a particular geographic area or cultural context, which may restrict the generalizability of the results.

SUGGESTIONS / RECOMMENDATIONS

Understanding and giving due attention to these socio-demographic factors while developing health strategies, implementing public health campaigns and educational programs, targeting vulnerable populations and promoting preventive measures can significantly reduce mortality and morbidity in those under five years old.

CONFLICT OF INTEREST / DISCLOSURE

None.

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