

THE EXPLORE THE DETERMINANTS OF DIARRHEA AMONG CHILDREN UNDER 5 YEAR OF AGE

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Abstract

Background: Diarrhea is a leading cause of morbidity and mortality among children under five years, particularly in low- and middle-income countries. Unsafe drinking water, poor sanitation, inadequate hygiene, and low maternal education are major contributors. Despite global improvements, diarrhea remains a critical public health issue, causing dehydration, malnutrition, and impaired growth in young children.

Objectives: This study aimed to determine the prevalence of diarrhea and identify its main determinants among children under five years in Nawabshah, Sindh, Pakistan.

Methods: A descriptive cross-sectional study was conducted over three months in the all Pediatric Wards of Maternal, Newborn, and Child Health Hospital, Nawabshah. A total of 147 children under five years of age ,admitted with or without diarrhea ,were recruited using a convenience sampling technique .Data were obtained from caregivers through a structured and pre-tested questionnaire collected data were coded, entered, and analyzed using the statistical package for social sciences (SPSS) Software. Descripretive frequencies, percentages, mean and standard deviation, were applied to summarize and interpret the findings. prior to data collection, ethical approval was secured from the concerned institutional authority.

Results: A total of 147 respondents were included in the study. the age distribution of children showed an approximately normal pattern. with most children falling into middle age categories (scores 2 and 3.) the mean age scores was 2.619 with standard deviation of 1.036.females constituted the majority of responedents (66%),while males accounted for (34%). Safe Stool disposal practices were reported by 87.8% of households, whereas 12.2% still practiced un safe disposal methods. The Prevalence of diarrhea within two weeks prior to the survey was high (72.8%).Most respondents stored drinking water in covered containers (95.2%) and had knowledge of proper hand -washing methods (88.4%). overall, the findings indicate a high burden of diarrhea among under-five children, despite relatively good access to water, sanitation, and health

services. limited maternal education and inadequate health education from healthcare providers remain important challenges in the effective prevention and home management of childhood diarrhea.

Conclusion: Diarrhea remains a significant health burden among under-five children in Nawabshah. Determinants that can be overcome by sanitation, water safety, hygiene education, and caregiver awareness are essential to reduce diarrhea prevalence and improve child health outcomes.

INTRODUCTION

Infections with bacteria, viruses, and protozoan parasites can cause these illnesses, particularly in young and adult children. Diarrhea is one of the leading causes of morbidity and mortality among children under five worldwide¹

Diarrhea has been prevalent in children under five for the past 20 years, and it has an impact on morbidity and mortality as well as cognitive development². Despite the fact that several risk factors for diarrhea in children, including Acute Respiratory Infections (ARI), recent diarrheal illness in the mother, maternal education, access to a reliable water source, unsafe water handling practices such as containers, poor sanitation facilities, overcrowded living conditions, inadequate breastfeeding practices, duration of breastfeeding, and the age of the child, diarrhea remains a serious public health problem among children under five years of age³. Significant correlations were found between under-five mortality and exclusive breastfeeding, maternal educational status, family monthly income, drinking water source, and hand washing of water storage tanks⁴. Diarrhea is a condition in which the body passes watery stool for three times a day⁵. Also, unhygienic stool disposal and open defecation practices are linked to an increased risk of diarrhea among children. Most of the fatalities occur in children who reside in low- and middle-income nations⁶. Diarrhea is often classed as acute or chronic based on clinical symptoms and acute diarrhea is common and is thought to be the primary cause of illness⁷. Dehydration causes death in young children⁸. The passage of three or more loose or watery stools in a 24-hour period, or an increase in stool frequency or liquidity that the mother deems abnormal, is known as childhood diarrhea⁹. The diarrheal illness is

caused by a number of socioeconomic factors (for example low household income, low maternal education, poor sanitation, infrastructure and limited health care access)¹⁰. The WHO claims that a significant amount of child mortality on the continent is caused by diarrheal illness¹¹.

They also offer housing that is a little shaky because weak buildings are frequently blown away or destroyed during storms and earthquakes¹². Young children are more susceptible to diarrhea when it occurs frequently because it can cause severe dehydration, malnutrition, and stunted growth. Frequent diarrhea can lead to severe dehydration, malnutrition, and stunted growth, making young children more vulnerable¹³. Even though all causes of diarrheal disease, including mortality, have decreased globally over the last 30 years, diarrhea is still the second most common major cause of infection-related deaths among children under five¹⁴. Approximately 1.5 to 2.2 million people die each year by diarrhea linked to poor sanitation, unsafe disposal of drinking contaminated water¹⁵.

Among children under five, diarrhea is a major public health concern and a leading cause of illness and mortality, particularly in developing nations. Inadequate child care procedures, contaminated water, and poor sanitation all greatly increase the burden of disease. Evidence-based interventions will be strengthened by determining the causes of diarrhea through clinical and community-level insights. The prevalence of childhood diarrhea is closely linked to environmental, behavioral, and socioeconomic factors. Poor sanitation, unsafe drinking water, inadequate hygiene practices, and improper child care procedures significantly increase the risk of infection.

MATERIAL AND METHODS

Determinants of diarrhea among children under 5 year of age. the study was conducted from 17November to 17 January 2026 after approval of Institutional Review Board (IBR).sample size was 147 calculated by using open epi info software, the calculation was based on 95% confidence level, an estimated population proportion of 50% and margin of error 5%.A non-probability sampling technique was used to select participants. The inclusion criteria included both male and female, patients diagnosed with diarrhea, children under 5 who reside in the chosen study area during the study period. Children were also included if their parents or other caregivers was willing to take

part and provide informed consent. The study was only take into account children who are available at the time of data collection. This study was not include children older than five who were not included if their parents or other caregivers refuse to take part or do not give their informed consent. Additionally, children who were very sick or whose condition prevents them from participating at the time of data collection was include, A structured questionnaire created in line with the goals of this descriptive study to gather data. Three sections made up the questionnaire. Participants' demographic details, including age, gender, place of residence, ethnicity, and family.

RESULT

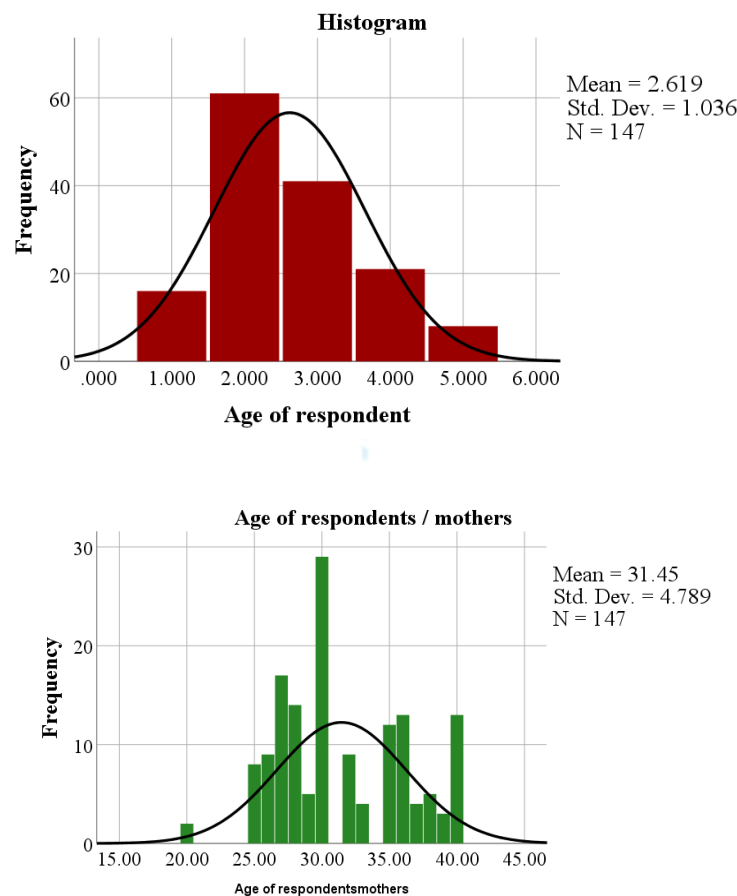


Figure no 1: Age distribution of children

Table no 1: Gender of respondents

Gender	Frequency	Percent
Male	50	34.0%
Female	97	66.0%

Table no 2: Maternal education of respondents

Maternal Education Level	Frequency	Percent
Illiterate	44	29.9%
Primary	22	15.0% ⁶
Matriculation	4	2.7%
Intermediate	2	1.4%
Graduate	75	51.0%

Table no 3: Occupation of respondents

Occupation of Parents	Frequency	Percent
House wife	120	81.6%
Others	12	8.2%

Table no 4: Fathers education level of respondents

Fathers' Education Level	Frequency	Percent
Illiterate	30	20.4%
Primary	4	2.7%
Middle	3	2.0%
Matriculation	1	.7%
Intermediate	4	2.7%
Graduate	105	71.4%

Table no5:Residency of respondents

Residency	Frequency	Percent
Rural	112	76.2%
Urban	35	23.8%

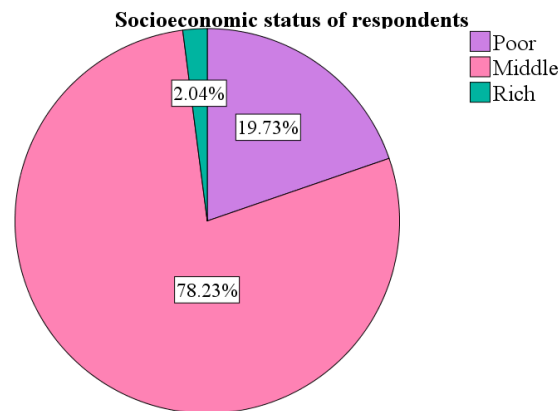


Figure No 3: Socioeconomic status.

Table no6:Religion of respondents

Religion	Frequency	Percent
Muslim	132	89.8%
Hindu	14	9.5%
Christian	1	.7%

Table no7:Ethnicity of respondents

Ethnicity	Frequency	Percent
Sindhi	102	69.1%
Punjabi	22	15.2%
Balochi	13	8.8%
Siraiki	10	6.8%

Table no 8:Family types of respondents

Family Type	Frequency	Percent
Single	15	10.2%
Joint	121	82.3%
Extended	11	7.5%

Table no 9: Environmental Variable Relating To Mother And Child

QUESTIONS	IMPROVED F (%)	UN-IMPROVED F (%)
Source of drinking water.	107 (72.8%)	40 (27.2%)
Sanitation facility access.	120 (81.6%)	27 (18.4%)
Toilet facility	132 (89.8%)	15 (10.2%)

Table no 10:

QUESTIONS	YES F (%)	NO F (%)
Vitamin a in last 6 months	90 (61.2%)	57(38.8%)
Having T.V in home	117 (79.6%)	30 (20.4%)
Having radio in home	89(60.5%)	58 (39.5%)
Internet use	112 (69.4%)	44 (29.9%)
Stool disposal method.	Unsafe stool disposal F (%)	Safe stool disposal F (%)
	81 (12.2%)	129 (87.8%)

Table no 11: SECTION C: DETERMINTS OF DIARRHEA

SECTION: C Determinants of diarrhea	Yes	No
Did your child have diarrhea within two weeks prior to the survey?	107(72.8%)	40(27.2%)
Do your store drinking water in covered containers?	140(95.2%)	7(4.8%)
Did you receive any health education about diarrhea from hospital staff/	66(44.9%)	81(55.1%)
Did your child get the rotavirus vaccine diarrhea protection?	111(75.5%)	36(24.5%)
Do you have knowledge about hand washing method?	130(88.4%)	17(11.6%)

Do you bring you child to the hospital because of diarrhea?	118(80.3%)	29(19.7%)
Did the doctor explain how to manage diarrhea at home?	68(46.3%)	79(53.7%)

DISCUSSION

The findings of this study show that diarrhea continues to be a major public health challenge among children under five years of age in Nawabshah, with a two-week prevalence of 72.8%. This high prevalence is consistent with recent studies conducted in Pakistan and other low- and middle income countries, which report that diarrheal diseases remain among the leading causes of childhood morbidity, particularly in rural and disadvantaged populations (Ali et al., 2021; UNICEF, 2022; WHO, 2023).¹⁶ The highest burden of diarrhea in this study was observed among children aged 1–2 years, which is in agreement with previous research indicating that toddlers are more vulnerable because of their developing immune systems and increased exposure to contaminated environments during weaning and crawling stages (Ahmed et al., 2022; Kamran et al., 2023).¹⁷ Similar patterns have been documented in South Asia, where early childhood remains the most critical period for diarrheal infections (WHO, 2023).¹⁸

Maternal education emerged as a key determinant of childhood diarrhea in the present study. A large proportion of mothers were illiterate or had limited education, restricting their awareness of hygiene, sanitation, nutrition, and preventive healthcare practices.¹⁹ These findings are supported by Khan et al. (2021) and Enam (2025), who reported that children of uneducated mothers have a significantly higher risk of diarrhea compared to those whose mothers have secondary or higher education. Despite higher educational levels among fathers, maternal caregiving practices were more directly linked to child health outcomes, as also emphasized in previous studies (UNICEF, 2022).²⁰ Environmental and behavioral factors also played an important role in diarrheal prevalence. Although many households had access to improved sanitation and toilets, a notable proportion still relied on unimproved water sources and unsafe stool disposal practices.²¹ This is consistent with the findings of

Murtaza et al. (2021) and Hailu et al. (2024), who identified unsafe drinking water, poor sanitation, and inadequate hygiene behaviors as major contributors to diarrheal diseases among under-five children.²² Furthermore, similar to earlier research, this study found that hygiene knowledge alone was insufficient unless supported by consistent practice and improved environmental conditions (Kamran et al., 2023).²³ Preventive healthcare measures showed partial success in this study. While most children had received rotavirus vaccination and Vitamin A supplementation, fewer than half of caregivers had received education regarding diarrhea management. Previous studies have also highlighted that vaccination alone cannot fully control diarrheal diseases without adequate caregiver education and timely treatment practices (WHO, 2023; Ahmed et al., 2022), Community-based health education programs have been recommended as an effective strategy to reduce childhood diarrhea (UNICEF, 2022; Enam, 2025). Socioeconomic and residential factors further influenced the outcomes in this study.²⁴ The majority of participants belonged to rural areas and the middle socioeconomic class, indicating that limited access to clean water, sanitation, and healthcare services increases the risk of diarrheal diseases. These findings are consistent with earlier research showing that rural residence and lower socioeconomic status are strongly associated with childhood diarrhea (Ali et al., 2021; Kamran et al., 2023).²⁴ This study is in line with previous research from 2021 to 2025, which demonstrates that childhood diarrhea is driven by a complex interaction of maternal education, environmental conditions, hygiene practices, and healthcare access. Effective reduction of diarrheal disease in Nawabshah requires integrated interventions focusing on maternal education, improved WASH infrastructure, promotion of safe hygiene behaviors, expanded vaccination coverage, and strengthened caregiver health education

programs, Such comprehensive approaches can significantly reduce morbidity and mortality and improve child health outcomes.²⁵

CONCLUSION

It is concluded that the high prevalence reported within two weeks of the survey, diarrhea is still a major public health concern among young children. The study found a number of significant factors that contribute to diarrhea, such as living in a rural area, having low maternal education, drinking water contamination, poor hygiene habits, inadequate sanitation facilities, and a lack of health education. . In order to lessen the burden of diarrhea and enhance child health outcomes in the study area, the results highlight the necessity of integrated public health strategies that focus on water safety, sanitation improvement, hygiene education, and caregiver awareness.

The prevalence and contributing factors of diarrhea in children under five years in Nawabshah, Sindh, Pakistan, were evaluated in this study. The results showed that, with a high prevalence reported within two weeks of the survey, diarrhea is still a major public health concern among young children. The study found a number of significant factors that contribute to diarrhea, such as living in a rural area, having low maternal education, drinking water contamination, poor hygiene habits, inadequate sanitation facilities, and a lack of health education. The study found a number of significant factors that contribute to diarrhea, such as living in a rural area, having low maternal education, drinking water contamination, poor hygiene habits, inadequate sanitation facilities, and a lack of health education. The high prevalence of diarrhea indicates that environmental and behavioral factors, such as hand hygiene and water storage practices, are important in the development of the disease, even though many households had access to better water sources and sanitation facilities. In order to lessen the burden of diarrhea and enhance child health outcomes in the study area, the results highlight the necessity of integrated public health strategies that focus on water safety,

sanitation improvement, hygiene education, and caregiver awareness.

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