

Prevalence of Diarrhoea and its association with Wasting, Age, and Gender in Children below Five years of age

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Abstract

Introduction: Diarrhea is the leading cause of malnutrition in children below the age of five. **Materials and Methods:** Present work consisted of total 440 children, selected by random multi-stage sampling method, based on sample selection criteria, executed in city, Fazilka, Punjab. **Results and Discussion:** The study showed overall prevalence of (5.5%, 24/440) diarrhea in whole study participants and high prevalence of (41%, 24/58) diarrhea in children, who had acute malnutrition (wasting) and it was accompanied by highly significant ($p < 0.001$), association between diarrhea and wasting in children. The prevalence of diarrhoea was found to be associated with age ($p < 0.001$), showed high prevalence (12%) in lower age group (2y-3y) in comparison to its low prevalence (2.7%) in higher age group (>3y-4y). Males children had less prevalence (5.4%) of diarrhea as compared with female children (5.5%), not statistically significant ($p = 0.5$). **Conclusion:** Diarrhea is invariably linked with age and acute malnutrition in children.

Key words: Acute malnutrition, Diarrhoea, Wasting

Introduction

Chronic diarrhea is prevalent in developing countries. It persists for more than two weeks and is also called persistent diarrhea. It is common in children in two to three year age group. It results into delayed healing of mucosa and decreased absorptive capability of intestine [1]. According to WHO report, diarrhea is the second foremost cause of death in children. Generally, diarrhea lasts for one week, but its continuity beyond 14 days, has dire consequences on the body of children. It drains water and minerals from body, resulting into dehydration. Children, who are malnourished and have compromised body immunity, are highly vulnerable to persistent diarrhea [2].

Lack of proper sanitization, unsafe drinking water and infections are common causative factors for diarrhea in developing countries. In chronic diarrhea, the children suffer from repeated attacks of watery stools that deprive their body of necessary minerals and water content. Therefore, diarrhoea is the principal cause of malnutrition, and malnourished children are more vulnerable to diarrhoea.

The aim of present study was to describe the prevalence of diarrhea in children below the age of five years and

its association with factors like wasting, age and gender in children in city, Fazilka in Punjab.

Materials & Methods

1. Research Design

Observational, Descriptive and Cross-sectional research study was undertaken.

2. Sampling Design

Study Area

Study was conducted in the city of Fazilka, Punjab. It is a city on Indo-Pak border in Punjab. As per census report of 2001, Fazilka has a population of 67,424, comprising 52% males and 48% females. In Fazilka, 13% of the population is under 6 years of age.

Sample Source and Sampling Units

Children below the age of five years, residing in and around Fazilka, Punjab, according to the inclusion and exclusion criteria, constituted the sample source and sampling units.

3. Participant Selection Criteria

Inclusion Criteria

1. Children between 2 years to below the age of five years.

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2. All the children who were physically and mentally healthy.

Exclusion Criteria

1. Children who were critically ill.
2. The children who were crying and agitated, did not cooperate in anthropometric measurement procedure.

4. Sampling Methods

Random, Multi-stage sampling technique was adopted.

In the first stage, the city was divided into three strata as: Elementary schools, Anganwadi (child care centres), Slum Areas

In the second stage, schools, anganwadi and slum areas were selected randomly from the sample frame.

In the third stage, all the children between two years to below five years of age, were selected as per the above stated selection criteria.

5. Data Collection Instruments

Observation schedules and interview schedules were employed for demographic and anthropometric parameters.

6. Data Collection Methods

1. Observation: This method was used to assess general behavior of children.
2. Interview: This method was adopted to collect data about frequency of stool passing and other additional

information on physical symptoms of children from the attendants.

3. Anthropometric parameters: The Weight and Height were measured by Digital Weight measuring scale and two meters Tape.

7. Data Collection Scales:

1. Data for the weight and height expressed in numerical values (n/N) and percentage (n/N)%.
2. Two weeks time interval for diarrheal was considered significant. Those having had an episode of diarrhoea, two weeks prior to time of interview were labelled as (Y), otherwise (N).

8. Statistical Design

1. Weight and height of the participants were expressed in Z- score classification, as recommended by WHO child growth standard, 2007.
2. The cut point of (-2SD), was used to compare the weight and height of participants with that of median of reference population, as follows:
Wasting as defined by WHO child growth standard [3].
A. (WHZ), weight/height of participant below -2SD (moderate low wasting)
B. (WHZ), weight/height of participant below -3SD (severe low wasting)
3. Bivariate analysis of categorical variables was done by Fischer’s Exact Probability test.
4. p-value of ≤ 0.05 was implied as statistically significant.

Results

Table 1: Participants distribution gender-wise and in different strata

Strata	Male		Female		Total participants (n/N)
	Frequency	(n %)	Frequency	(n %)	
Schools	143/240	59%	97/240	41%	240/440
Anganwadi(child care centre)	78/127	61%	49/127	39%	127/440
Slum residents	39/73	53%	34/73	47%	73/440

Tables 1, showed overall distribution, 240/440, 127/440 and 73/440 of study participants in different strata as in Schools, Anganwadi and Slum areas and distribution of study participants as males in schools, anganwadi and slum areas, 59% (143/240), 61% (78/127) and 53% (39/73) respectively. The female participants were 41% (97/240), 39% (49/127), 47% (34/73).

Table 2: Age-wise distribution of participants

Age Group	Schools		Anganwadi(child care centre)		Slum residents	
	Frequency	(n%)	Frequency	(n%)	Frequency	(n%)
2Y to 3Y	88/240	37%	42/127	33%	39/73	53%
>3Y to 4Y	80/240	33%	42/127	33%	24/73	33%
>4Y to <5Y	72/240	30%	43/127	34%	10/73	14%

Table 2, showed the age-wise distribution of children in schools as 37%, 33%, 30% and 33%, 33%, 34% in anganwadi and 53%, 33%, 14% in slum areas in the age groups of (2y-3y), (>3y-4y), (>4y-<5y) respectively.

Table 3: Prevalence of Wasting and Diarrhoea in children under age of five years

Strata	Normal children		Wasting in children		Diarrhoea in children	
	(n/N)	(n)%	(n/N)	(n)%	(n/N)	(n)%
Schools	213/240	89%	27/240	11%	10/27	37%
Anganwadi	107/127	85%	20/127	15%	6/20	30%
Slum residents	62/73	85%	11/73	15%	8/11	72%

Further, analysis of table 3, confirmed prevalence of (41%, 24/58) as a whole and segmental prevalence of (37%), (30%) and (72%) diarrhoea in children, accompanied by (11%), (15%) and (15%) of wasting in children.

Table 4: Prevalence of Diarrhoea in different age groups and in male & female children under age of five

Variables		Diarrhoea		Normal children	
		(n/N)	(n/N)%	(n/N)	(n/N)%
Age	2y-3y	20/169	12%	149/169	88%
	>3y-4y	4/146	2.7%	142/146	97.3%
Gender	Males	14/260	5.4%	246/260	94.6%
	Females	10/180	5.5%	170/180	94.5%

Table 4, showed the prevalence of (12%) diarrhea in age group (2y-3y), higher in comparison to prevalence of (2.7%) diarrhea in age group (>3y-4y) in children under age of five. Further, it showed the prevalence of diarrhea (5.4%) in male and (5.5%) in female children.

Table 5: Showing Fischer's Exact Probability test between Diarrhea and Wasting in children

	Diarrhoea	Non-diarrhoea	P value
Wasting	24	34	P< 0.001
Normal	0	382	

Table 6: Showing Fischer's Exact Probability test between Diarrhea and Age of children

	Diarrhoea	Non-diarrhoea	P value
2y - 3y	20	149	P= 0.001
>3y - 4y	4	142	

Table 7: Showing Fischer's Exact Probability test between Diarrhea and Gender of children

	Diarrhoea	Non-diarrhoea	P value
Male	14	246	P= 0.5
Female	10	170	

Fischer's Exact Probability test was conducted between different categorical parameters. Tables 5, 6, and 7 displayed highly significant, ($P < 0.001$) and ($P = 0.001$) association between variables (Diarrhoea-Wasting) and (Diarrhoea-Age). Further, non-significant ($P = 0.5$) association between (Diarrhoea-Gender) was noticed.

Discussion

Diarrhea is multifactorial disorder and the leading cause of death in children in both developed and developing countries. In the present study, it is evident that diarrhea has high overall prevalence of (41%) in children suffering from wasting under age of five years. These findings are supported by still higher prevalence of diarrhea (56.6%-58.6%) in children in a study conducted by Joshi et al, [4] in Bahraich district, Uttar Pradesh, India. Although, the prevalence of diarrhea differs in both, present and earlier studies, Owing to disparity in food availability, socio-economic status, time of data collection, literacy rate etc. However, past study authenticates the presence of high rate of occurrence of diarrhea in children with wasting (acute malnutrition). Actually, diarrhea and malnutrition both interplay viciously and undermine the health of children.

Diarrhea is decidedly, associated with wasting (acute malnutrition), as indicated by ($p < 0.001$), in present study. It is supported by work of Siddique et al, [5]. A study in India among hospitalized children also reported a high association of diarrhea with severe stunting by Sachdev et al., [6].

Present finding are similar with earlier study by Njuguna & Muruka [7], both the studies indicate highly significant ($p < 0.001$) association between diarrhea and malnutrition.

The under taken study, further, proves that diarrhea is more prevalent (12%) in lower age group (2y-3y) in contrast to prevalence (2.7%) in the upper age group (>3y- 4y). Additionally, the present work proves that diarrhea is very much associated with the age group of children ($p = 0.001$). These findings in present study are

substantiated by earlier work of Teklemariam et al, [8] in south west Ethiopia and another study by Bhatnagar & Dosaih [9], in Delhi slum areas.

Both, present and previous studies, indisputably describes the reciprocate relation between prevalence of diarrhea and age group of children.

The study at present, describes that prevalence of diarrhea is not affected by gender of children and it has no significant, ($p = 0.5$) association with gender of children. This study is proved by another work by Swierczewska et al, [10] in Kenya.

Conclusion

Diarrhea is a fatal disease, liable for childhood mortality and morbidity. It poses great challenge at the hands of physicians to treat diarrhea in age group, below five years, owing to multiplicity of causes for diarrhea in (0-5y) age. Acute malnutrition (wasting) is detrimental to physical and mental health of children especially in tender age of under five years. Wasting is associated with diarrhea. Further, age is another factor that is covariate with prevalence of diarrhea. A decline in age group always increases occurrence of diarrhoea in children.

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