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Determinants of Diarrhea Among Children of Less than Five Years in Balochistan, Pakistan

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ABSTRACT

Background: Diarrheal diseases are a global health problem that is of great importance for the health of children in developing countries. Identifying the various factors influencing the onset and subsequent treatment is necessary to design effective and robust public health initiatives.

Methods: For this crosse-sectional, case study research design was used. After merging, out of 10,432 children, 10170 observations were matched. Furthermore, data was analyzed with 9411 observations by using STATA-12. For the analysis of a two-way table based on complex survey data, the Wald statistic has been used. For multivariate analysis, logistic regression for survey data was done.

Result: The risk of diarrhea among children under 5 years of age in Balochistan was 21.56%. The results of bivariate analysis revealed that seven factors were found statistically significant association between diarrhea and area, region, household wealth index quintiles, main source of drinking water, households' main material of floor, material available for washing hand and education of household head. The odds ratio suggests that children in rural areas were 80% more likely to improve risk of diarrhea than its urban counterpart [OR=1.8, 95% CI:1.21-2.7; p= 0.004]. Children of Makran region 66% more likely have chance of having diarrhea than children of Quetta region [OR=1.66, 95% CI: 0.95-2.89; p=0.073]. The final multivariate logistic regression model was constructed with selected explanatory variables which had p-value ≤ 0.25.

Conclusion: This study showed an increased risk of developing diarrhea in children in rural areas. Children of Sibi, Kalat, Zhob and Makran divisions were separately at risk of developing diarrhea. Considering age, the maximum threat of diarrhea among children was aged 12-35 months. The MICS 2010 survey data of Balochistan provides a picture of factors significantly associated with risk of diarrhea at provincial level and can be useful for policy making at national level.

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1. INTRODUCTION

Diarrhea is the leading cause of morbidity and mortality in children under five years of age in developing countries, as an estimated 0.525 million deaths occur worldwide due to diarrhea every year in children under five with 1.7 billion incidents of diarrheal infections (Aziz et al., 2018). Around the world, these children suffer on average 3.3 episodes each year, but in some areas the rate exceeds nine episodes per

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year. In frequent episodes, young children spend more than 15 percent of their day from diarrhea. About 80 percent of deaths occur due to diarrhea in the first two years of life (Sharma & Kumar, 2015). According to another study, approximately 18 percent of infant death annually occurs due to diarrhea worldwide (Siregar et al., 2018). Although living standards have improved, diarrheal diseases still cause significant social and economic shortfalls (Mokomane et al., 2018).

According to the WHO, the risk of diarrhea in a region indicates dirty drinking water and poor sanitation system (World Health Organization, 2000). The nature of diarrhea depends greatly on the age of the child. The group of children most at risk of developing diarrhea is that diarrhea becomes more common in the first two years of life. However, the likelihood rate decreases with age (Boschi-Pinto et al., 2008).

Diarrhea is one of the most important causes of malnourishment. During diarrhea, patients eat less and their capability to absorb nutrients is lessened. In addition, food must increase because of an infection. Among children, malnutrition is generally determined by evaluating the anthropometric status of the child relative to a reference standard (Hoke & McCabe, 2021). Malnutrition is both a risk factor and a consequence of diarrhea in children. There is a significant correlation between diarrhea and malnutrition (Tickell et al., 2020).

Achieving good nutrition status of children is important to reduce the burden of diarrhea in children. Diarrheal diseases are a global health problem that is of great importance for the health of children in developing countries. Identifying the various factors influencing the onset and subsequent treatment is necessary to design effective and robust public health initiatives (World Health Organization, 2003).

In a study, most mothers in Pakistan have certainly heard of oral rehydration solution (ORS) packets, the number slightly, indicates that they use in practice in the treatment of children with diarrheal disease was one of the factors contributing to this event. Its effects may vary in terms of accessing rural / urban resources available among the children of mothers who received (Mumtaz et al., 2014).

Fortunately, simple, and operational treatment are available that can significantly reduce diarrhea deaths become unnecessary in most cases patients and prevent the negative effects of diarrhea on nutritional status. WHO points out that achieving the Millennium Development Goals to diminish child mortality by two-thirds of 1990 levels by 2015 will be contingent on renewed efforts to prevent and control malnutrition, pneumonia and diarrhea (Kassebaum et al., 2017).

In the context of Balochistan, research studies have reported interdistrict disparities in access to health care services (Panezai, 2012). In addition to this, studies have also reported low utilization of the health care services at the health facilities particularly in rural areas of the province (Panezai et al., 2017; Panezai et al., 2020a; Panezai et al., 2020b). These studies have assessed the situation of primary health care services. There is shortage of literature on access to diarrhea in the context of Balochistan. Few studies has assessed diarrhea in children less than 5 years of age in Quetta (Kasi et al., 1995; Zil-e-Huma et al., 2019). However, the literature lacks provincial level assessment of diarrhea. To fill the gap, this study aimed at assessing the determinants of diarrhea among children less than five years in Balochistan, Pakistan.

2. METHODS

2.1 Study design

For diarrheal cases, a cross-sectional study design was used. Descriptive and analytical assessment were done by quantitative methods.

2.2 Setting

The study area was provincial level covering both urban and rural with six regions (divisions) comprising 30 districts in Balochistan province in 2010. These six divisions have been described as sampling strata. Balochistan is a least developed province of Pakistan with predominately rural population (Ashraf, 2019;

Panezai, 2012). The province has a population of 12.34 million as per the 2017 census (Pakistan Bureau of Statistics, 2017). The people has poor socio-economic conditions with agriculture as main source of livelihood (Rehman et al., 2019).

2.3 Data sources and measurement

Balochistan MICS dataset consists of five SPSS data files including children dataset, household dataset, individual household member dataset and dataset of households' Mosquito nets were obtained from UNICEF. Data were recoded, cleaned, merged, and analyzed using STATA version 12. Dependent variable and most independent variables were found or computed/recoded directly in the children data set. Variables of interest which were not contained in the children data set were added to the children data set through merging of the children dataset with the data set that contained the variable(s) of interest. The cluster number (HH1), household number (HH2), individual line number (LN) and mother/caretaker's line number (UF6) were computed to form a unique person identification number in each data set which formed the basis upon which merging was done.

The primary study of MICS-Balochistan was organized by the Planning and Development department (P&D), Government of Balochistan from May to September 2010. This secondary study was conducted in March 2019 to March 2020.

2.4 Sampling

The study population was all children aged less than five years of Balochistan in 2010. The target MICS sample size in Balochistan was 12,378 households. A total of 12,378 households were sampled. Which consist of 89,218 members including 18,958 women 15-49 years, and 10,432 children under age five. In the sample size calculation, immunization, literacy rate, postnatal and antenatal care were used as indicators.

2.5 Inclusion and exclusion criteria

All children aged below 5 years were included in this study. Children whose data on age was missing were excluded from analysis.

2.6 Data analysis methods

Data was merged by using cluster number, household number and individual line number as key variables. After merging, 10170 observations were matched. During the cleaning of the data some missing values were found in dependent variable (diarrhea). Therefore, 756 observations were discarded. Furthermore, data was analyzed with 9411 observations. Final analysis contains:

2.6.1 Univariate analysis

All data were analyzed by using STATA 12. First, each variable was explained in univariate analysis to express the distribution frequency, percentage distribution, the mean, median and standard deviation where needed.

2.6.2 Bi-variate analysis

An easy way to study the association of two discrete variables is the two-way table. If the data came from a simple random sample (SRS), the test of independence could be used though Pearson's chi-square statistic. To analyze a two-way table based on complex survey data, the testing process should be modified for the survey design. Various test-statistics were suggested. Koch, Freeman, and Freedman proposed using the Wald statistic and it has been used widely (Koch, Freeman, and Freedman 1975). Therefore, Wald statistic is applied to establish the association between diarrhea and each explanatory variable among children less than age of five in the province of Balochistan, Pakistan:

- Association between household socio-demographics factors and diarrhea in children aged less than five years
- Association between maternal/caretaker's demographic factors and diarrhea in children aged less than five years
- Association between child socio-demographics factors and diarrhea in children aged less than five years
- Association between child nutritional status factors and diarrhea in children aged less than five years

2.6.3 Multivariable analysis

Multivariate logistic regression analysis ran for survey data to estimate the effect of the indicator variables on the outcome variable using survey data analysis procedure in STATA 12 to perform logistic regression for sample survey data. All statistically significant variables ($p \leq 0.05$) in bivariate analysis were involved in the binary logistic regression. Therefore, the outcome of multivariate analysis has been formed by the chosen variables has a value of $p < 0.20$.

3. RESULTS

3.1 Bivariate analysis of factors association with diarrhea in children aged less than 5 years

3.1.1 Household socio-demographic factors:

Past 14 days (preceding the survey) the risk of acute diarrhea among children under 5 years of age in Balochistan was 21.56%. The results of bivariate analysis revealed that seven factors were found statistically significant association between diarrhea and area, region, household wealth index quintiles, main source of drinking water, households' main material of floor, material available for washing hand and education of household head. Results of Table 1 showed that risk of diarrheal was higher (22.92%) in rural than urban areas (18.36%). There were different episodes of diarrhea in different regions. Quetta region is considered as urban with the lowest diarrhea rate (15.27%). Sibi region being a rural area had the highest diarrhea rate (37.05%). Overall region was found statistically significant with diarrhea.

The lowest risk of diarrhea (19.64%) was found in children who belonged to the quintile of the richest wealth index while fourth wealth index quintile had the highest (26.34%) risk of diarrhea in children. Results found the lowest risk of diarrhea (18.4%) among children having the earthen floor while the highest rate (23.09%) in children from households with the non-earthen floor. The percentage of diarrhea in children whose household heads with non-education level was higher (22.13%) than having primary education level (19.14%). This study did not find significant association between risk of diarrhea in children and type of toilet facility, toilet facility shared, type of fuel using for cooking, having electricity, number of children (results not shown). The question on method of disposal of child feces applied only in households who had children aged less than 36 months. Among these children, feces disposal method was not statistically significant associated with risk of diarrhea (results not shown).

3.1.2 Maternal/caretaker's and child's demographic factors

The outputs of this research showed risk of diarrhea among children who have no significant association with overall age of mothers, education level of mothers, number of children ever born, mother's current marital status, received antenatal care, place of delivery, child's gender, birth registered, DPT immunization among children aged 7-59 months, BCG immunization among children. Diarrheal rate was higher among male children (22.1%) than among female children (21.7%). High statistically significant association exists between acute diarrhea and child age, measles immunization among children aged 12-59 months. Children at the age group of 12–23 months had the highest (28.75%) proportion of diarrhea occurrences. The lowest (17.69%) diarrhea rate was aged 48-59 months among children. Significant association was found between

acute diarrhea in children who were ever breastfed and never. Greater proportion of diarrheal disease (22.15%) was found among children who have ever breastfed than never (15.87%).

Table 1. Association between children's factors and diarrhea aged less than 5 years

Factors	Yes	No	Wald	p-value
	N (%)	N (%)		
Area			25.6322	0
Urban	379 (18.36)	1685 (81.64)		
Rural	1684 (22.92)	5663 (77.08)		
Region			13.1712	0
Quetta	302 (15.27)	1676 (84.73)		
Kalat	409 (21.18)	1522 (78.82)		
Sibi	508 (37.05)	863 (62.95)		
Zhob	357 (16.15)	1854 (83.85)		
Nasirabad	326 (26.12)	922 (73.88)		
Mekran	161 (23.96)	511 (76.04)		
Wealth index			4.1006	0.0027
Poorest	439 (20.78)	1674 (79.22)		
Second	421 (21.63)	1525 (78.37)		
Middle	416 (21.2)	1546 (78.8)		
Fourth	476 (26.34)	1331 (73.66)		
Richest	311 (19.64)	1272 (80.36)		
Source of drinking			11.9695	0.0006
Improved	1372 (20.69)	5258 (79.31)		
Unimproved	689 (24.86)	2083 (75.14)		
Treat drinking water			15.295	0.0001
Yes	389 (32.26)	817 (67.74)		
No	1661 (20.39)	6484 (79.61)		
Main material of floor			23.3694	0
Earthen	427 (18.4)	1894 (81.6)		
Not earthen	1623 (23.09)	5407 (76.91)		
Washing hands			3.9861	0.0463
Yes	737 (23.43)	2408 (76.57		
No	335 (20.74)	1280 (79.26)		
Education of household head			3.2907	0.0377
None	1436 (22.13)	5054 (77.87)		
Primary	169 (19.14)	714 (80.86)		
Secondary+	454 (22.55)	1559 (77.45)		
Age of child			7.6173	0
0-5	161 (21.7)	581 (78.3)		
6-11	132 (23.91)	420 (76.09)		
12-23	404 (28.75)	1001 (71.25)		
24-35	481 (24.48)	1484 (75.52)		
36-47	474 (19.55)	1950 (80.45)		
48-59	411 (17.69)	1912 (82.31)		
*Measles immunization**			5.6312	0.0179
Yes	423(24.75)	1286(75.25)		
No	674(26.44)	1875(73.56)		
Child ever been breastfed			18.7117	0
Yes	1985(22.15)	6977(77.85)		
No	66(15.87)	350(84.13)		

Source: MICS Balochistan, 2010

3.2 Multivariate analysis

Binary logistic regression was used to predict the probability of an infant under the age of five years could experience acute diarrhea. Depending on bivariate analysis outcomes, eleven variables have a value of $p \leq 0.05$ were included in model as explanatory variables. Explanatory variables that met this principle were Area, Resident by region, Wealth index quintile, Main source of drinking water, treat water to make safer for drinking, Main material of floor, Material available for washing hands, Education of household head, age of children, measles vaccination, ever breastfed. While keeping under control for other factors and employed ≤ 0.25 (Hosmer et al., 2000) as statistically significant has found that:

Results of table 2 showed significant association between risk of diarrhea and area [OR=1.74, 95% CI: 1.17-2.60; p=0.006]; and region [OR=0.95, 95% CI: 0.899-1.01; p=0.171]; and wealth index quantile [OR=1.1, 95% CI: .97-1.25; p=0.135]; and Main source of drinking water [OR=1.37, 95% CI: 1.02-1.83; p=0.033]; and measles immunization with aged 12-59 children [OR=0.792, 95% CI: 0.616-1.02; p=0.069].

The odds ratio suggests that children in rural areas were 80% more likely to improve risk of diarrhea than its urban counterpart [OR=1.8, 95% CI: 1.21-2.7; p=0.004]. It was observed that children from Kalat region have 1.91 times more likely to affect the incidence of childhood diarrhea than those who were from Quetta region [OR=1.91, 95%, CI: 1.3-2.79; p=0.001]. Alike children from Sibi region have 1.36% more likely developing risk of diarrhea in children than those who were from Quetta region [OR=2.36, 95% CI: 1.5-3.71; p=0.000]. Similarly, children of Makran region 66% more likely have chance of having diarrhea than children of Quetta region [OR=1.66, 95% CI: 0.95-2.89; p=0.073].

The odds suggests that children with second wealth index quintiles have 2% higher risk of diarrhea than with poorest wealth index quintile [OR=1.02, 95% CI: 0.712-1.49; p=0.829]. The odds of children whose households got through unimproved source of drinking water had 48% higher to have diarrhea than those whose households used improved source of drinking water [OR=1.48, 95% CI: 1.1-1.99; p=0.01].

The odds of children who did not use treated water to make safer for drinking had 54 times less likely to develop diarrhea than the odds of who used treated water to make safer for drinking [OR=0.46, 95% CI: 0.309-0.69; p=0.000]. Children with 12-23 months old were 46% more likely to acquire risk of diarrhea than children aged 48-59 months [OR=1.46, 95%, CI:1.05-2.01; p=0.021]. Children who ever breastfed 1/0.62=1.6 times more likely to affect the incidence of childhood diarrhea than children who never breastfed [OR=0.62, 95% CI: 0.299-1.28; p=0.2].

Children with no earthen floor house have 51% more odds to develop diarrhea compared to house with earthen floor [OR=1.51, 95% CI: 0.98-2.33; p=0.061]. No significant association was found between risk of diarrhea and material available for hand washing, education level of household heads (results not showed). The odds of children with no measles immunization have 6% less likely of being victim of diarrhea than the odds with measles immunization [OR=0.94, 95%, CI: 0.72-1.28; p=0.78].

Table 2. Multivariate analysis of factors associated with diarrhea in children aged less than 5 years

Variables	Odds Ratio	95% CL		p-value
		Lower	Upper	
Area				0.006**
Urban	1			
Rural	1.808796	1.21288	2.697498	0.004
Region				0.171*
Quetta	1			
Kalat	1.908373	1.305277	2.790126	0.001
Sibi	2.361455	1.500434	3.716573	0.000
Zhob	0.496106	0.327982	0.75041	0.001
Nasirabad	0.812674	0.533545	1.237834	0.333

Mekran	1.661992	0.953166	2.89794	0.073
Wealth				0.135*
Poorest	1			
Second	1.028978	0.711974	1.487127	0.879
Middle	1.120561	0.751738	1.670339	0.576
Fourth	1.228863	0.787096	1.918576	0.364
Richest	1.559978	0.839371	2.899234	0.159
Source of drinking				0.033**
Improved	1			
Unimproved	1.480873	1.100428	1.992846	0.01
Treat water				0.000***
Yes	1			
No	0.462698	0.309739	0.691191	0.000
Material of floor				0.246*
Earthen	1			
Not earthen	1.512585	0.980743	2.332836	0.061
Age of child				0.002**
12-23	1.459716	1.058017	2.013928	0.021
24-35	1.493781	1.075119	2.075472	0.017
36-47	0.962843	0.704588	1.315757	0.812
48-59	1			
Measles				0.069*
Yes	1			
No	0.960703	0.721917	1.278471	0.783
Breastfed ever				0.216*
Yes	1			
No	0.621144	0.299869	1.286627	0.2
constant	0.210593	0.090396	0.490611	0

Source: MICS Balochistan, 2010

*Statistically significant with p-value ≤ 0.25

**Statistically significant with p-value ≤ 0.05

***Statistically significant with p-value ≤ 0.001

3.3 Logistic regression modelling

The final multivariate logistic regression model was constructed with selected explanatory variables which had p-value ≤ 0.25 (Hosmer, Lemeshow et al. 2000). Since the first logistic regression model had nine variables with p ≤ 0.25 included children's area, region, household wealth index quantiles, main source of water, treat water to make safer for drinking, main material of floor, child age, measles immunization and child ever been breastfed. And results are shown in Table 3.

In final logistic regression model, some variables found insignificant effect on diarrhea in children with p-value<0.05 i.e., region, wealth index quantiles and measles immunization. While six other variables still have effect to diarrhea:

Area, earthen type floor, child age and treated water to make safer for drinking have strongly statistically significant association with risk of diarrhea. The odds ratio shows that children in rural areas were 39% more likely to develop diarrhea than their urban area [OR=1.39, 95%, CI: 1.061-1.822; p=0.004]. The odds of children who did not use treated water to make safer for drinking had 46 times less likely developed diarrhea than its counterpart [OR=0.54, 95% CI: 0.40-0.73; p=0.000]. Children with no earthen floor house have 49% more odds to develop diarrhea compared to house with earthen floor [OR=1.49, 95% CI: 1.15-1.92; p=0.002]. 12-23 months old children were 53% more likely to develop diarrhea than 48-59 months old children [OR 1.53, 95% CI: 1.17-2.01; p=0.002].

Results described that breast feeding has statistically significant impact on diarrhea. Children who ever breastfed 1/0.43=2.33 times more likely to affect the incidence of childhood diarrhea than those who never breastfed [OR=0.43, 95% CI: 0.265-0.719; p=0.001].

Table 3. Logistic regression modeling

Diarrhea	B	Odds Ratio	95% CL		p-value
			Lower	Upper	
Area [a)]	0.329	1.390656	1.06106	1.822633	0.004*
Region					0.417
Quetta ®	0	1			
Kalat	0.487971	1.629008	1.234477	2.149629	0.001**
Sibi	1.209212	3.350842	2.359948	4.757792	0.000**
Zhob	-0.59687	0.5505347	0.38426	0.78876	0.001**
Nasirabad	-0.10051	0.9043721	0.623974	1.310774	0.595
Mekran	0.611107	1.84247	1.332868	2.546911	0.000**
Wealth					0.128
Poorest ®		1			
Second	0.018616	1.01879	0.758304	1.368756	0.902
Middle	-0.01132	0.9887466	0.738235	1.324267	0.939
Fourth	0.055883	1.057474	0.784855	1.424787	0.713
Richest	0.129487	1.138244	0.755514	1.71486	0.535
Source of drinking water [b)]	0.332241	1.394088	1.108663	1.752996	0.073
Treat water to make safer [c)]	-0.60727	0.5448367	0.40553	0.731997	0.000**
Main material of floor [d)]	0.399269	1.490735	1.155435	1.923336	0.004*
Age child					0.000**
12-23	0.429225	1.536066	1.172954	2.011588	0.002*
24-35	0.33317	1.395384	1.093077	1.781298	0.008*
36-47	-0.00049	0.9995145	0.787858	1.268033	0.997
48-59 ®	0	1			
Measles immunization [e)]	0.241125	1.27268	1.03684	1.562165	0.138
Child ever been breastfed [f)]	-0.82852	0.436694	0.265054	0.719484	0.002*
Constant	-1.66837	0.1885541	0.106234	0.334665	0.000

*Statistically significant with p-value ≤ 0.05
**Statistically significant with p-value ≤ 0.001

® Reference group
a) rural compared to urban area
b) unimproved compare to improved source of drinking water
c) not treat water compared to treat water
d) not earthen floor compares to earthen floor
e) not measles immunization compared to measles immunization
f) not breastfed compared to breastfed

4. DISCUSSION

This study has evaluated the determinants of diarrhea among children less than five years in Balochistan, Pakistan. In Pakistan, the primary health care (PHC) services are disbursed through health care facilities at primary level (Panezai et al., 2019). Treatment of diarrhea is one of the main services provided by the primary health care facilities (Panezai, 2017). In Balochistan, the network of primary health care facilities include the basic health units (BHUs), rural health centers (RHCs) and civil dispensaries (Ali & Panezai, 2021). Assessing diarrhea has been of great significance particularly in children under five years of age.

The prevalence of diarrhea was 21.56% (2063 out of 9411 children), lower than the results (28.5%) of Sindh, Pakistan MICS data that is about 28.5% of children suffering from diarrhea (Irfan et al., 2017). This might be due to better hygienic methods in childcare and improved approach to clean water in Balochistan.

Household socio-demographic factors can bear significant impacts on diarrhea morbidity in children. By both bivariate analysis and multivariate analysis area has significant association with risk of diarrhea. Similar results were obtained in the Dakahlia, Egypt (El Gilany & Hammad, 2005). This could be related to differences in socio- demographic factors between rural and urban dwellers. However, this observation can be investigated further.

Multivariate analysis indicated that the incidence of diarrhea among infant was elevated in rural areas than in urban areas. Similar study has shown that living in urban habitation was extremely related with diarrheal incidence in Iraq (Mubarak, 2020).

Resident by region also has statistically significant association with risk of diarrhea by both bivariate and multivariate analysis. Children who live in Sibi and Kalat regions have more diarrhea than those in the Quetta region. Another study from Kenya also found living area making significant difference in the impact on the incidence of acute diarrheal disease among infants (Onyango & Angienda, 2010).

The present study shows that the wealth index quintile was significantly related with risk of diarrhea. Related to economic status, numerous findings have found a significant association between family economic conditions and risk of diarrhea in children (Boadi & Kuitunen, 2005; Hatt & Waters, 2006).

In Balochistan province 24.86% household found to use unimproved source of drinking water. This study revealed that main source of drinking water has strongly statistically significant association with acute diarrhea incidence in children. Dissimilar findings have found no significant association between risk of diarrhea in children and main water sources (Netsereab & Xenos, 2017). Households who have improved sources of drinking water, have less diarrhea than children in households with unimproved drinking water sources.

This study revealed that child's feces disposal method has no significant association with risk of diarrhea in children. Similar results have been found in Bangladesh (Islam et al., 2018).

This study also found a strong association between childhood diarrhea and dirt floor. A similar study from Eritrea observed that children living in the residence with the non-ground floor life were 43% less likely to affect the incidence of childhood diarrhea than those who live in dirt floor residence (Woldemicael, 2001).

This study revealed that the material available for hand washing is statistically significantly associated with diarrhea. Encourage washing hand activities could decrease diarrhea incidences in developed countries by 29% and by 31% in under-developed (Barclay, 2008).

In given research household heads education level was significant association with risk of diarrhea. Similar findings were found in Brazil (Voth-Gaeddert et al., 2018). In given research, the level of education of the mother in the bivariate analysis of the prevalence of diarrhea in children has no significant effect. Secondary+ education level of mother was low incidence of diarrhea among children. Mothers of Kenya have found high incidence of diarrhea in children who have no education (Onyango & Angienda, 2010).

Educated mothers are more vulnerable to the importance of hygiene, improved child feeding and care practices, and are more aware of the disease causal factors and preventive measures. However, findings of this study could mean that a big majority of mothers/caretakers in Balochistan have adequate information on childcare irrespective of level of education. Further studies should be done to explore this hypothesis.

This study suggests that in Balochistan, diarrhea in children is associated with factors other than the nutritional status of a child. More studies should be done to clarify this unanticipated observation.

5. CONCLUSION

The MICS 2010 survey data of Balochistan provides a picture of factors significantly associated with risk of diarrhea at provincial level and can be useful for policy making at national level. This study showed an increased risk of developing diarrhea in children with rural areas. Children of Sibi, Kalat, Zhob and Makran divisions were separately at risk of developing diarrhea. Considering age, the maximum threat of acute diarrhea among children was aged 12-35 months. Child health services, such as the measles vaccine was not enough to avoid children under five are suffering from diarrhea. Unimproved source of drinking water was also risk of diarrhea in children. An association between diarrhea and main source of drinking water was observed with children. Not treated source of drinking water was also risk of diarrhea. This study found increased risk of diarrhea among children in households with not earthen floor. This study found high risk of diarrhea in area, treat of water to make safer, main material of floor, age child and child ever been breastfed. This study suggests the policymakers and health department should focus on provision of safe drinking water throughout the province and provision of diarrhea

DECLARATIONS

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