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Socio-Demographic Factors Associated with Maternal Use of Oral Rehydration Therapy (ORT) and Dispensary Treatment for Diarrhea among Children Under Five Years Old: Pakistan DHS (2012-13)

Summera Aziz

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ABSTRACT

Socio-Demographic Factors Associated with Maternal Use of Oral Rehydration Therapy (ORT) and Dispensary Treatment for Diarrhea among Children Under Five Years Old: Pakistan DHS (2012-13)

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Abstract

Objectives: Diarrheal disease is a global health challenge that assumes gigantic importance with regard to child health in developing countries like Pakistan. Prompt medical attention and proper use of Oral Rehydration Therapy (ORT) by mothers helps prevent dehydration and secondary complications among affected children. However, ORT use among mothers in Pakistan is low. This study seeks to examine how various sociodemographic factors impact the use of ORT and dispensary treatment among mothers of children affected with diarrhea.

Methods: Data from Pakistan Demographic Health Survey (2012-2013) was used for the study. The study sample consisted of women aged 15-49 years old resident in Punjab region (N= 505) with children under five years old who had diarrhea within two weeks of the survey. Chi-square tests and logistic regression analyses were used to determine relationships between maternal socio-demographic characteristics and use of ORT and dispensary care. P-values <0.05 were considered statistically significant.

Results: After controlling for place of residence, educational level and frequency of watching television, caregivers whose children had fever with diarrheal episodes had nearly two-fold increased odds of using ORT treatment [OR= 1.9, (95% CI: 1.28-2.82)], compared to those whose children did not have fever. Similarly poor and middle class socioeconomic status (SES) participants had 3 times increased odds [OR= 2.76, [95% CI: 1.1 -6.89)] of using dispensary treatment when compared to upper class mothers. Place of residence was not a significant predictor of ORT or dispensary use.

Discussion: These findings are consistent with other studies that show that mothers' socioeconomic status are a good indicator of their knowledge about ORT use, and health care seeking behavior. On the other hand, maternal place of residence was not a significant predictor

of ORT use, or consultation at a dispensary, even though other studies have found significant associations.

Conclusion: Interventions aimed at improving low-income mothers' knowledge about diarrhea management can include lay medical personnel, such as dispensers, who are often the easily accessible medical resource to this population. Therefore, dispensers should be provided with further training to increase their knowledge and skills in treating children with diarrhea. Future studies that are more rigorous should be conducted to examine this public health issue.

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APPROVAL PAGE

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Summera Aziz

Author's Statement Page

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Summera Aziz

Table of Contents

Acknowledgements	6
Author's Statement Page	7
List of Figures	9
List of Tables.....	10
INTRODUCTION.....	11
Background	11
Purpose of Study	12
Research Questions	12
REVIEW OF THE LITERATURE	14
Treatment of Diarrhea	14
Pakistan's Ministry Of Health And ORS Promotion Program	15
Maternal Health Care Seeking Behavior - Dispensary	16
Place of Residence.....	17
METHODOLOGY	18
Data Source:	18
Data Collection.....	18
Geographic Information	19
Study Design and Participants.....	19
Measures and Variables.....	20
Data Analysis	23
RESULTS	24
Association between maternal residence and use of ORT treatment.....	27
Association between mothers' sociodemographic factors and use of ORT treatment.....	29
Association between mothers' sociodemographic factors and treatment from dispensary	29
DISCUSSION AND CONCLUSION	32
Discussion	32
Association with place of residence	32
ORT treatment and maternal sociodemographic characteristics	32
Dispensary treatment and maternal sociodemographic characteristics.....	34
Implications of Findings.....	35
Conclusion.....	36
REFERENCES	37

List of Figures

Figure 1: Flow chart of diarrheal cases under 5 years in Punjab

Figure 2: Distribution of Maternal use of ORT for Childhood Diarrhea in Total Sample (N=505)

Figure 3: Distribution of Maternal use of Medical dispensary for Childhood Diarrhea in Total Sample (N=505)

List of Tables

Table-1: Frequencies of ORT and dispensary treatment use by mother's socio-demographic characteristics whose children had diarrhea (N=505)

Table-2: Association between mother's socio-demographic characteristics whose children had diarrhea and use of ORT treatment (N=505)

Table-3: Association between mothers' sociodemographic factors whose children had diarrhea and treatment from dispensary (N=505)

CHAPTER I

INTRODUCTION

Background

Diarrhea is the passage of three or more watery stools per day. In infants and children under five years of age, who are particularly vulnerable, the frequency of bowel movement may increase up to ten stools per day. If left untreated, it leads to dehydration and severe malnutrition in children (“World Health Organization (WHO)” 2009). Diarrheal disease is a second leading cause of death among children under five in developing countries. Approximately 2.5 billion children under five years of age suffer from diarrhea illness each year (Kosek, Bern, & Guerrant, 2003). More than half of these diarrheal cases occur in Africa and South Asia, where multiple episodes of diarrhea cause serious outcomes and are more likely to result in death. There is a loss of about 1.5 million lives each year due to diarrheal illness (“WHO”, 2009).

In Pakistan, diarrheal illness accounts for an estimated 200,000 - 300,000 deaths among children each year (Government of Pakistan and UNICEF, 1996). According to Pakistan Medical Association (PMA), one child dies every minute from diarrhea and acute respiratory infection (Pakistan Medical Association (PMA), 2011). Diarrheal disease is a global health challenge that assumes gigantic importance with regard to infant health in the developing world. Identifying the various factors that impact its occurrence and subsequent treatment is vital to design effective and robust public health interventions.

Diarrhea illness and related dehydration can be prevented by proper and timely oral rehydration treatment (ORT) by mothers at home (Alam & Ashraf, 2003). Recent studies have shown that most mothers in Pakistan have indeed heard of ORS (Oral Rehydration Solution) packets but only few have actually used it in treating their children’s diarrheal illness. One factor

contributing to this occurrence may be urban/rural differences in access to available resources among mothers of affected children (Mull & Mull, 1988). Urban-rural variations may be associated with non-compliance with treatment or poor treatment practices among mothers. Therefore, exploring the associations based on mother's demographic variables and ORT can substantially assist with determining practical interventions that are cost-effective and efficient in the management of diarrhea in the pediatric populations in Punjab.

Purpose of Study

Although several studies have been conducted in other countries in the area of childhood diarrhea to demonstrate the treatment practices of mothers, in Pakistan only limited studies have been carried out. This study is designed to provide further insight about the relationship between mothers' socio-demographic characteristics and management of childhood diarrhea using oral rehydration therapy (ORT) and dispensary treatment.

Research Questions

The purpose of this study is to contribute to the existing body of literature on the relationship between sociodemographic factors and maternal management of diarrheal disease in Punjab. This study will examine the following questions and related hypotheses;

- 1) Is there any association between maternal place of residence and use of ORT for diarrheal treatment in children under age five?

Hypothesis: Mothers who live in urban areas will be significantly more likely to use ORT when compared to mothers who reside in rural areas.

2) Do ORT use among under-five old diarrhea subjects differ by mothers' socio-demographic factors such as age, educational attainment, wealth index, availability of electricity in household, watching television and child fever?

Hypothesis: There are differences between ORT use among under-five old diarrhea subjects with respect to their mother's socio-demographic factors such as age, educational attainment, wealth index, availability of electricity in house, watching television and child fever.

3) Do medical treatment of a dispensary among under-five old diarrhea subjects differ by mothers' socio-demographic factors such as age, educational attainment, wealth index, availability of electricity in household, watching television and child fever?

Hypothesis: There are differences between medical treatment use among under-five old diarrhea subjects with respect to their mother's socio-demographic factors such as age, educational attainment, wealth index, availability of electricity in house, watching television and child fever.

CHAPTER II

REVIEW OF THE LITERATURE

Treatment of Diarrhea

Many cases of diarrhea can be easily treated at home by increasing fluid intake and continuing feeding during diarrheal illness (“WHO | Diarrhea,” 2009). In 1980, the United Nations Children’s Fund (UNICEF) launched the revolution for child survival and development by focusing its efforts on four methods – growth monitoring, breastfeeding, immunization, and the use of oral rehydration salt (ORS) as the best treatment for dehydration caused by diarrhea. Child mortality can be reduced by using good quality care, timely use of cost-effective interventions like ORT and utilization of immediate health provider in underdeveloped countries (“UNICEF/WHO” 2014).

ORT (Oral rehydration treatment)

Oral rehydration solution (ORS) is the gold standard treatment option in childhood diarrhea. It is an inexpensive, immediate and a simple way to treat this disease at home as it improves dehydration by replacing lost fluids (Deen, 2003). Management of diarrhea is considered incomplete without the use of ORT. Numerous studies have documented the effectiveness of oral rehydration therapy in the management of diarrheal disease in children under five. The annual numbers of death attributed to diarrhea in this age group fell from 4.6 million to 1.5 million from 1980 till 2000 after the use of ORS became the standard treatment regimen (Victora et al, 2000).

Oral rehydration therapy (ORT) is an important modality in controlling mortality due to diarrheal disease in developing countries like Pakistan. UNICEF in collaboration with the

National Institute of Health (NIH), has made good progress in providing ORT for children suffering from diarrheal disease in Pakistan (Wardlaw, et al, 2010). Known by the brand name, NIMKOL (which is derived from the Urdu word for salt, Nimak), the ORS packets are common in Pakistan. When used as directed, ORT is effective for treatment of dehydration in 80% of acute diarrhea cases (Mull & Mull, 1988). Some fraction of these cases with co-infection and serious complications require antibiotics or intravenous therapy (Mull & Mull, 1988). Recent studies have found that only 39% of children under the age of five receive ORT in developing countries (“WHO” 2009: Wardlaw, et al, 2010).

Pakistan’s Ministry Of Health And ORS Promotion Program

In 1984, Pakistan’s Ministry of Health, in collaboration with the NIH and UNICEF launched a multimillion-dollar Oral Rehydration Solution Therapy (ORT) program across the country to reduce the burden of this disease (Donald E. Morisky et al., 2002). For more than a decade, this program has promoted the use of ORS in the country through widespread educational campaigns to reduce the morbidity and mortality related to the diarrheal disease (Donald E. Morisky et al., 2002).

The Punjab government spends large sums of money on educating caregivers through media campaigns as part of the ORT program, but so far, because of very low literacy rate among rural female population and lack of convenient access to media, this media adventure has not borne desirable results. Mothers still do not know how to make proper ORS solution from the ORS packet. According to recent study, among 91% of mothers who have heard of ORS, only one-third (34.6%) of them administered it during diarrheal episodes of their children (Mull & Mull, 1988). This gap suggests that while ORS campaigns are successful in delivering their

message, these programs are failing to change the behavior of caregivers in treating childhood diarrhea (Donald E. Morisky et al., 2002; Mull & Mull, 1988). This non-compliance can arguably be traced back to the lack of general education and lack of awareness as well as to the differences in poor living conditions prevailing in places of residence. All these factors are adding to difficulties of the low-income families that now suffer high infant and child morbidity and mortality because of this debilitating and ill-managed malady (Das, Salam, & Bhutta, 2014; Halvorson, 2004).

Maternal Health Care Seeking Behavior - Dispensary

In most of the Punjab areas, available basic health care facilities are inadequate to serve the target communities. Modern health care resources such as private clinics, small hospitals and midwifery centers are abundant in or near the towns and small rural dispensaries can be seen in some areas. Most people seek health care from dispensaries, lady health workers, and traditional healers including hakims, herbalists and molvis (religious curer) who serve both rural and urban areas (Mull & Mull, 1988; Shaikh & Hatcher, 2005; Halvorson, 2004).

The inherent cultural practices adopted by the caregivers in the management of childhood diarrhea have been studied in one Kashmir village (Ahmed et al., 2009). They showed that about 28% and 9 % of respondents have used ORT in past and during the current diarrheal episodes respectively. Thus, despite the widespread ORS campaigns, caregivers still use inappropriate medical services and alternative therapies to treat diarrhea in remote areas of country (Ahmed et al., 2009; Hudelson, 1993; Mull & Mull, 1988).

Place of Residence

The epidemiology and burden of diarrheal disease varies according to the region and place of residence. This is due to the lack of access to safe water, inadequate sanitation, and poor hygienic conditions in most developing countries. In fact, about 88 percent of deaths related to diarrhea globally are attributable to unsafe water, poor sanitation and lack of hygiene (“WHO | Diarrhoea,”2009). Place of residence is an important determinant for treating diarrheal illness with ORT in developing countries (Coreil & Genece, 1988). According to the WHO, in developing countries, children in urban areas (42 %) are more likely to receive ORT treatment than those residing in rural areas (38%) (“WHO | Diarrhea,” 2009). Researchers have found that the use of ORT depends primarily on local living conditions, household environment, and traditional socio-economic setup (Ali, Atkinson, & Underwood, 2000).

In Pakistan, health care facilities are inadequate to address the need of the population especially in urban slums and shantytowns. Significant efforts have been made in strengthening the public health sector during the past decade. However, despite many improvements, diarrhea remains a major cause of mortality and morbidity among children in these areas due to unsafe drinking water, inadequate sanitation, and shared toilet facilities (Quadri et al., 2013).

CHAPTER III

METHODOLOGY

Data Source:

Data from Pakistan Demographic Health Survey (DHS) 2012-2013 was used for this study. This study was restricted to “Woman Questionnaire” that specifically included information about child health for children who were born in the last five years.

Data Collection

Pakistan Demographic Health Survey (2012-2013) was conducted with the help of ministry of National Health Services (NHS) and implemented by the National Institute of Population Studies (NIPS). The DHS data in Pakistan was administered through household questionnaire. Completed questionnaire were entered into the Computer Assisted Field Editing (CAFÉ) system for further reviewing and editing by the field editors in the field while interviews were taking place from October 2012 until April 2013 (“Demographic Health Survey (DHS)” 2012).

The Pakistan Bureau of Health Statistics (PBS) provided all the household listings and sample design to this survey for making sample areas across the country. The sample unit of this population was considered as small area called enumeration block in urban cities and towns. Each block consists of average 200 to 250 household and further divided into low, middle and high-income categories. Thus, there were 26,543 enumeration blocks. In rural areas, lists of all villages, dehs or mouzas were prepared and used as unit of analysis for sampling frame (DHS, 2012).

Geographic Information

Pakistan has four provinces and one federally administrative “Tribal Area” (formerly known as the Northern Areas). The Punjab is a land of five-rivers and is the most populous province of Pakistan. Nearly 70 percent of the Punjab’s population live in rural areas. (“Punjab Health Department,” 2012). The Punjab has the highest rate of deaths among children under the age of five. Diarrheal illness is a second major cause of mortality and morbidity in this age group and it kills 27,000 kids every year in Punjab (“Diarrhea in Punjab”, 2015:“Punjab Health Department” 2012).

Study Design and Participants

This study was a cross-sectional design. The participant’s residence was categorized as urban (in any of the cities and towns) and rural (outside cities or towns). Children included in the study were those under the age of five years who had diarrhea two weeks before the survey as reported by the household mothers. A sample size of 3,800 households was estimated for the survey in Punjab. The information on diarrheal disease was gathered by asking caregivers whether their child had experienced a diarrheal episode at any time during the two weeks preceding the interview. If the child had had diarrhea, the mother was asked about diarrheal episodes, treatment patterns and usage of ORS. The final sample for this study was made up of 505 women who have children under 5 years old and had diarrhea within two weeks of the survey. The final sample for this study included 191 (38%) urban and 314 (62.2%) rural women. Figure-1 displays the flow chart for the eligible participants for this study.

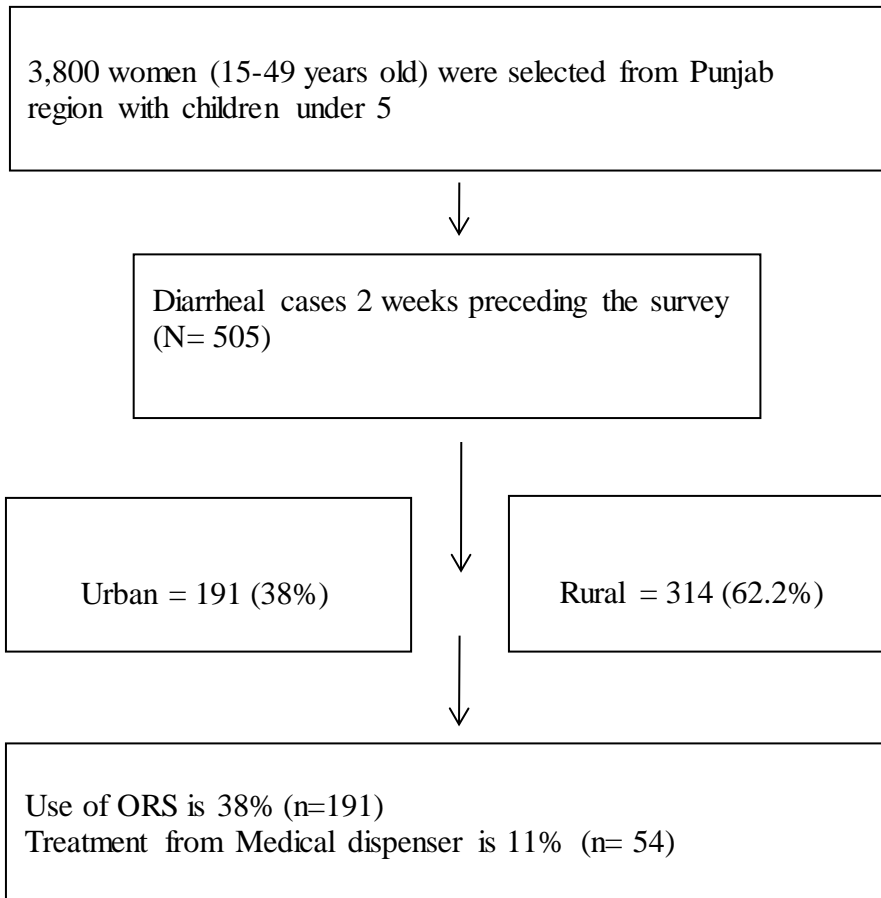


Figure 1. Flow chart of diarrheal cases under 5 years in Punjab

Measures and Variables

The selected independent variables were chosen based on literature review for the maternal management of childhood diarrhea by use of ORT and medical dispensary treatment.

Other independent variables were age, highest education, wealth status, availability of electricity, the frequency of watching TV and child having fever.

Diarrhea

Diarrheal disease was defined as having three or more watery stools in a twenty-four hours duration.

Type of place of residence

Participant's residence was defined as either urban or rural. Participants were categorized as rural living if they reside outside cities and towns. Urban area consists of a city or town and mostly populated area with more amenities.

Oral Rehydration Therapy (ORT)

Oral rehydration therapy is one of the known methods for correcting or treating dehydration caused by diarrhea.

Dispensary shop

A shop where medicines and medical supplies are dispensed. Free and inexpensive medical advice are available in these medical shops. A person who works here is called dispenser and usually he does not require any certification or diploma to work here.

Children under five years of age (0-59 months)

This variables related to prenatal/postnatal care and children's health are only available for children born in the last five years. (DHS 2012-13)

Children who had diarrhea recently

Children ill with diarrhea (as defined by the respondent—child's mother) at any time during the two weeks preceding the interview. Recoded into Diarrhea = 0 when no diarrhea, Diarrhea= 1 (Yes) when have diarrhea, last 24 hours and last two weeks before the survey.

Woman age

Women of reproductive age (15-49) were included for individual interview in this survey (DHS, 2012-13).

Maternal education

Maternal education was registered as the highest education level attained and were grouped into three categories (primary/elementary level (5th grade), middle school, high school and higher education).

The wealth-index (socio-economic) status

The wealth-index (socio-economic) status was classified as poor, middle class, rich or richer.

It was based on data from the household characteristics, type of drinking water source and toilet facilities (shared or not). Assets used for the socio-economic computation included both large (for example, land, farmhouses, houses and car ownership) and small household items comprising of radio sets, television, telephone, electric fans, etc. Wealth index were recoded into three categories into 'poor', 'middle' and 'upper class'.

The availability of electricity for individual household

The availability of electricity was coded in yes, no or not in daytime.

Frequency of watching television

Woman's general exposure to electronic multimedia was recorded as none, once or less than once a week and more than once a week of watching television.

Data Analysis

The analysis was done using IBM SPSS and SAS 9.4 software. The survey data was analyzed in relation to two dependent variable ORT (Oral dehydration therapy) and treatment from dispensary. Respondent variables included place of residence, maternal age, education attainment, wealth status, household availability of electricity, and frequency of watching TV. In addition, one measure of the child health status was studied: whether child had fever in last two weeks with diarrheal episodes or not.

The data was analyzed in three phases. First, frequency distribution of dependent and independent variables were computed. Second, univariate (unadjusted) analyses were performed among each independent variables and outcome variables of use of ORT and medical dispensary treatment. In the third step, multiple logistic regression analyses were performed to determine association between selective independent variables and dependent variables (ORT and dispensary care) controlling for place of residence, wealth index, woman age, watching TV and child status of fever, using only those independent variables that were significant in the univariate level of statistical analysis.

Odds ratios and respective 95% confidence intervals were calculated to determine if an association exists between maternal place of residence and ORT and Dispensary care. Potential confounding variables that were controlled for included age and socio-economic status, watching TV (as use of multimedia for health awareness) and child having fever (as health status of having serious outcomes of dehydration and malnutrition).

CHAPTER IV RESULTS

A total of n=192 caregivers reported giving ORT treatment and n=54 received treatment through medical dispensary for childhood diarrhea under the age of five years, two weeks before the survey in Punjab (n=505).

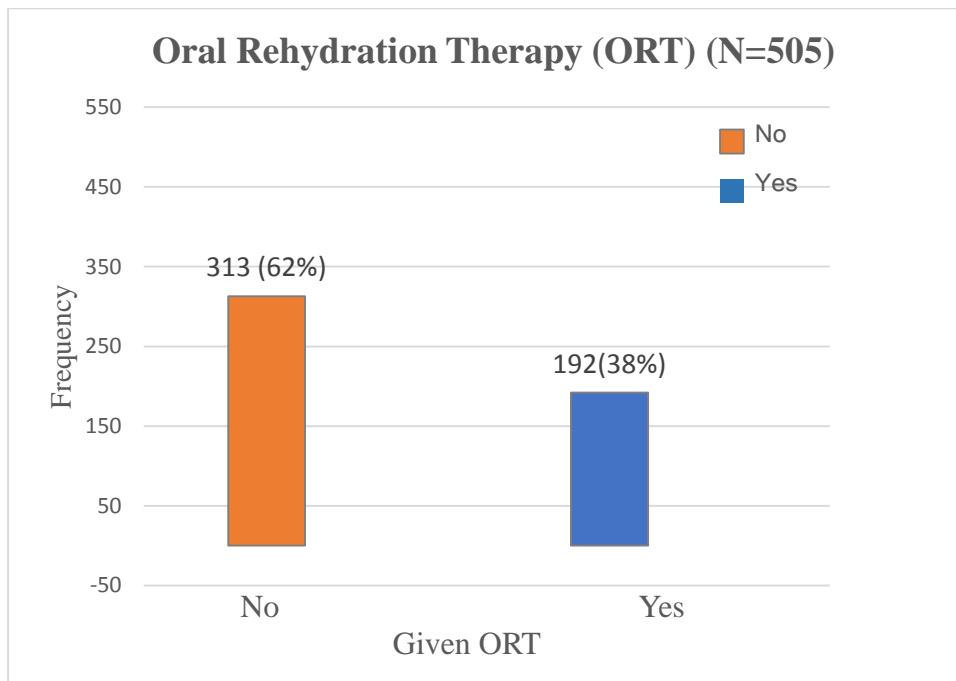


Figure 2: Distribution of Maternal use of ORT for Childhood Diarrhea in Total Sample (N=505)

Figure 2, displays graphical distribution for dependent variable, maternal use of ORT in Punjab. Only 38 % (n= 192) respondents used ORT for childhood diarrhea in the study sample (N=505).

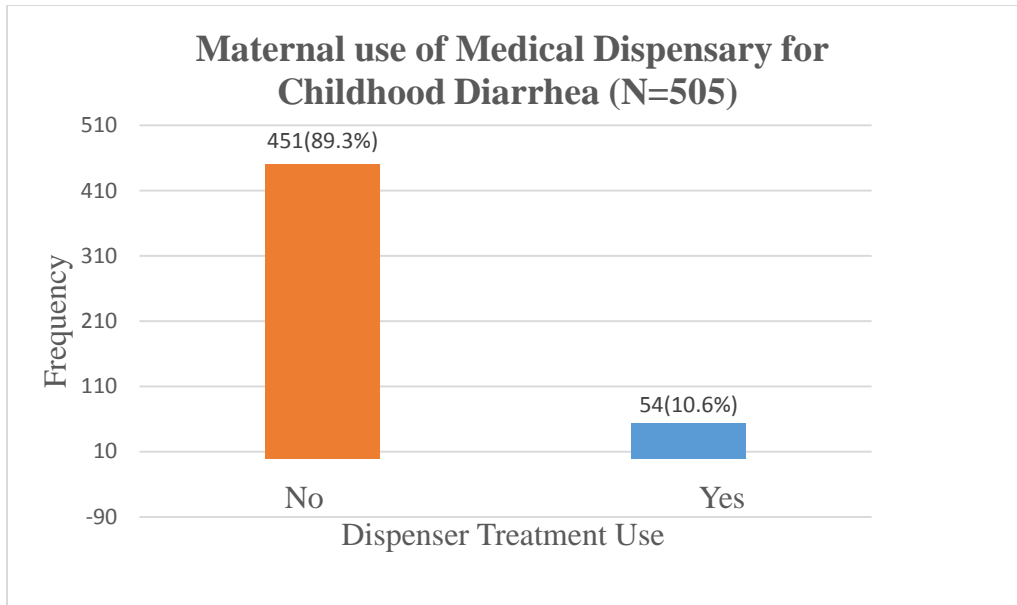


Figure 3: Distribution of Maternal use of Medical dispensary for Childhood Diarrhea in Total Sample (N=505)

Figure 3, displays the distribution of medical dispensary usage by mothers for diarrhea treatment for children in urban and rural areas. About 11% of study participants used medical dispensary for the treatment of their sick children. The proportions of the maternal use of ORT and medical dispensary treatment for childhood diarrhea in Punjab has shown in Table-1.

Table-1 Frequencies of ORT and dispensary treatment use by mother's socio-demographic characteristics whose children had diarrhea (N=505)

All Variables	(N= 505)	Treated with ORT		Treated with Diapensary meds.	
		N= 192 (38%)		N= 54 (10.6%)	
	All	n (%)	p-value	n (%)	p-value
By Place of Residence			0.16		<0.001
Rural	314	112 (35.6)		45 (14.33)	
Urban	191	80 (41.9)		9 (4.71)	
By Woman Age (Years)			0.83		0.81
< 30 yrs.	310	119 (38.3)		34 (10.9)	
> 30 yrs.	195	73 (37.6)		20 (10.3)	
By Woman Education			0.21		0.001
≤ Primary (5th grade)	353	128 (36.26)		48 (13.6)	
> Primary	152	64 (42.11)		6(4)	
By Wealth Index			0.08		<0.001
Poor	152	48 (31.5)		28 (18.42)	
Middle class	127	47 (37.01)		17 (13.39)	
Upper class	226	97 (42.9)		9 (3.9)	
By Household Electricity			0.11		0.82
None	16	3 (18.7)		2 (12.5)	
24 hrs.	415	178 (39.4)		49 (10.86)	
Night time only	38	11 (29)		3 (7.8)	
By Frequency of Watching TV			0.53		0.63
None	126	46 (36.5)		16 (12.7)	
< 1/wk	137	48 (35)		15 (10.95)	
≥ 1/wk	242	98 (40.5)		23 (9.5)	
By Child Had Fever in last 2 wks			0.001		0.54
No	187	54 (28.8)		18 (9.6)	
Yes	317	138 (43.53)		36 (11.36)	

Footnotes:

Frequency was calculated by N (%)

P value <0.05 was considered statistical significant and calculated by chi-square test

ORT = Oral rehydration therapy,

Table-1 findings show the proportions of the maternal use of ORT and medical dispensary treatment for childhood diarrhea in Punjab. Out of those caregivers (n=54) who used medical dispensary treatment, 84 % (n=45) were from rural area.

Association between maternal residence and use of ORT treatment

In this study sample, place of residence was not associated with caregiver's use of ORT treatment for childhood diarrhea (p-value =0.16). Likewise, there was no association between all other independent variables and ORT use except child having fever. Among children who had diarrhea and fever (n=317) two weeks before the survey, 43% (n=138) received ORT treatment in the study sample (P-Value= <0.05). The most significant predictors of medical dispensary use were place of residence, maternal education and wealth status (P-Value= <0.05).

The univariate analyses were performed among each independent variables and outcome measure of ORT use. Odds ratios and respective 95% confidence intervals were calculated to determine if an association exists between child treatment with ORT and maternal place of residence. There was 1.3 times increased odds of using ORT for childhood diarrhea in urban mothers as compared to rural mothers in Punjab (95% CI: 0.89-1.87). However, the association was not statistically significant.

Table-2: Association between mother's socio-demographic characteristics whose children had diarrhea and use of ORT treatment (N=505)

Variable	Unadjusted OR (95% CI)	*Adjusted OR (95% CI)
Place of Residence		
Urban	1.3 [0.89, 1.87]	1.05 [0.67, 1.63]
Rural (ref)	1	1
Woman age (Years)		
< 30 yrs. (ref)	1	1
> 30 yrs.	0.96 [0.66, 1.39]	0.98 [0.67, 1.44]
Woman education		
≤ Primary (5th grade) (ref)	1	
> Primary	1.27 [0.86, 1.88]	NS
Wealth index		
Poor (ref)	1	1
Middle class	1.27 [0.77, 2.09]	1.34 [0.79, 2.28]
upper class	1.63 [1.05, 2.51]	1.6 [0.92, 2.8]
Has electricity		
None (ref)	1	
24 hrs.	2.82 [0.8, 10.05]	NS
Night time only	1.76 [0.41, 7.43]	
Frequency of watching TV		
None (ref)	1	1
< 1/wk.	0.93 [0.56, 1.55]	0.73 [0.42, 1.26]
≥ 1/wk.	1.18 [0.76, 1.84]	0.96 [0.57, 1.6]
Child had fever		
No (ref)	1	1
Yes	1.89 [1.3, 2.8]	1.9 [1.28, 2.82]

Footnotes:

Statistical significant confidence interval value are in bold letters

OR (odds ratio) and 95% CI (confidence interval), Reference category = '1'

NS – Not significant in bivariate analysis OR did not control for confounding.

* Adjusted for woman age, wealth index, frequency of watching TV and child fever.

≤ Primary Education (5th grade) = primary education or less than primary education.

Association between mothers' sociodemographic factors and use of ORT treatment

Table-2 shows the association between selected independent variables (women residence, maternal age, wealth status, education attainment, availability of electricity, child fever) with ORT use.

The result of the univariate analysis indicated that, mothers in the upper class socioeconomic status (SES) were 1.63 times more likely to use ORT as compared to poor mothers whose children had diarrhea two weeks before the survey [OR= 1.63, (95% CI: 1.05-2.51)]. However, after controlling for education, wealth index, and frequency of watching TV, the relationship was no longer statistically significant. Caregivers whose children had fever with diarrheal episodes had nearly two-fold increased odds of using ORT treatment, in bivariate [OR= 1.89, (95% CI: 1.3-2.8)] and multivariate analysis [OR= 1.9, (95% CI: 1.28-2.82)] respectively. There was no significant association between caregiver's age and frequency of watching TV with maternal use of ORT.

Association between mothers' sociodemographic factors and treatment from dispensary

Table 3, shows the results of the analysis between selected independent variables and maternal use of dispensary for diarrhea treatment in Punjab.

As univariate analysis has shown, rural residence, maternal education and wealth index were associated with increased use of dispensary for diarrhea treatment. There were about four times increased odds of using dispenser services among rural mothers when compared to urban mothers [OR= 3.38, (95% CI: 1.61 -7.1)]. Likewise, being less educated (< 5th grade) [OR= 3.8, (95% CI: 1.6 -9.15)] and belonging to poor and middle class was significantly associated with increased odds of using dispensary treatment for childhood diarrhea, [OR= 5.44, (95% CI: 2.48 - 11.91)] and [OR= 3.72, (95% CI: 1.61 -8.63)] respectively.

Table-3 Association between mothers' sociodemographic factors whose children had diarrhea and treatment from dispensary (N=505)

Variable	Unadjusted OR (95% CI)	*Adjusted OR (95% CI)
Place of Residence		
Urban (ref)	1	1
Rural	3.38 [1.61, 7.1]	1.58 [0.67, 3.71]
Woman age		
< 30 yrs.	1.07 [0.6, 1.9]	
> 30 yrs. (ref)	1	NS
Woman education		
≤ Primary (5th grade)	3.8 [1.6, 9.15]	2.03 [0.8, 5.2]
> Primary (ref)	1	1
Wealth index		
Poor	5.44 [2.48, 11.91]	3.84 [1.47, 10.1]
Middle class	3.72 [1.61, 8.63]	2.76 [1.1, 6.89]
upper class (ref)	1	1
Has electricity		
None	1.66 [0.25, 11.06]	
24 hrs.	1.42 [0.42, 4.8]	NS
Night time only (ref)	1	
Frequency of watching TV		
None	1.38 [0.7, 2.72]	0.68 [0.32, 1.43]
< 1/ wk.	1.17 [0.58, 2.32]	1.01 [0.5, 2.06]
≥ 1/ wk. (ref)	1	1
Child had fever		
None	0.83 [0.45, 1.51]	NS
Yes (ref)		

Footnotes:

Statistical significant confidence interval value are in bold letters

OR = odds ratio, 95% CI = confidence interval

Reference category = '1'

NS – Not significant in bivariate analysis OR did not control for confounding.

* Adjusted for education, wealth index, and frequency of watching TV

However, after adjustment for potential confounding variables, wealth index was the only variable that remained significantly associated with the use of dispensary care.

The participants with poor class socioeconomic status (SES) had about four times increased odds [OR= 3.84, [95% CI: 1.47 -10.1)] and mothers belonging to middle class had 3 times increased odds [OR= 2.76, [95% CI: 1.1 -6.89)] of using dispensary treatment as compared to upper class mothers.

CHAPTER V

DISCUSSION AND CONCLUSION

Discussion

The primary objective of this study was to examine the association between maternal socio-demographic factors and the use of ORT and dispensary for the treatment of diarrhea in Punjab.

Association with place of residence

Overall, this study yielded no significant association between maternal place of residence and treatment of diarrhea with use of ORT and medical dispensary in children under age of five years. Results from the logistic regression analyses demonstrated that maternal place of residence, age, education attainment, and wealth index were not significant predictors of ORT use among participants. Strikingly, this result is inconsistent with findings by other literature in this field (Coreil & Genece, 1988) which found significant association between ORT use and maternal place of residence. Researcher observed that there was increase rate of usage of ORT in urban mothers, which is not supported by this study. Although there were 42% (n=80) of mothers in urban area who gave ORT treatment to children having diarrhea in urban sample (n=191) but it was not significantly associated with maternal place of residence. (P-value =>0.05)

ORT treatment and maternal sociodemographic characteristics

This study yielded significant association between fever among children who had diarrhea and use of ORT treatment (table-2). In univariate analyses, upper class SES and child fever were associated with increased ORT use. When residence, woman age and wealth status

were controlled in multivariate logistic regression, the net effect of child fever remained significant (Table-3).

This study found that mothers who correctly perceived the signs of severity with child fever were more likely to seek care and gave ORT to sick children. Clinical symptoms indicating the severity of diarrhea, such as fever were better perceived as important signs of infection and dehydration by mothers who sought care and used ORT (Quadri et al., 2013). This pattern was relatively consistent with previous studies (Mull & Mull, 1988; Hudelson, 1993). Probably, it was due to the fact that many caregivers did not recognize the child diarrhea as an 'illness' earlier unless it was accompanied by fever and other serious outcomes. In these circumstances, ill children get ORT treatment late in the disease process when caregiver seek health care advice for fever (Mull & Mull, 1988; Shaikh & Hatcher, 2005).

Hudelson, (1993) has described in detail about caregiver's health seeking behavior in poor neighborhood of Managua where ORS use was associated with clinic attendance, which was also observed in this study findings. It is not surprising that while ORS is widely available, caregivers of diarrhea patients do not commonly use it until they get advice from health care system. Researchers have found that mothers generally do not have much knowledge and awareness of this disease and usually believe in alternative therapies to treat childhood diarrhea. There is an important relationship in mother's knowledge of their children disease and influence on caretaking it. The better she knows the causes of diarrhea, the more efficiently she can manage it with accessible resources (Malik et al., 1992).

In Punjab, most of the families live below the poverty line. The minimum wages are Pak. Rs. 9000 (approx. US90\$) per month (Rehman, Shaikh, & Ronis, 2014). Additionally, there is no social health insurance system. Thus, health expenditure represents a very significant

proportion of any family's budget. This may have contributed to health seeking behavior of such families. Mothers of ill children may delay seeking medical care until they get comorbid serious infections (fever) (Shaikh & Hatcher, 2005; Rehman et al., 2014).

Dispensary treatment and maternal sociodemographic characteristics

In univariate analyses, rural residence, less education attainment (< 5th grade), low and middle class SES were found to be associated with increased use of dispensary for diarrhea treatment. When residence, education and wealth were controlled in multivariate logistic regression, the net effect of lower and middle class SES remained significant (Table-4).

Specifically, our results indicates that there was statistically significant increased odds of using dispensary treatment for childhood diarrhea among the lower and middle class mothers than mothers belonging to wealthier families. This study finding was consistent with previous studies, which found an association between maternal practices for diarrheal management and their socio-economic status (Malhotra & Upadhyay, 2013; Coreil & Genece, 1988).

Rehman's study in this area, confirmed the findings from the existing literature, and found the association between family income and choice of health care provider for consultation. Mothers with upper class usually sought private health care services earlier and poor mothers prefer to go to the small dispensaries or Govt. clinic where they can get free advice and cheap medicines over the counter (Rehman et al., 2014). Consistent with the prior results (Coreil & Genece, 1988), child diarrheal treatment was associated with maternal residence and material wealth. It is more likely, that respondents who accessed dispenser for diarrheal treatment were from rural area and belonged to poor SES.

Most strikingly, dispensary have become common in Pakistan. People can buy anything from corner stores without any prescription (Rehman et al., 2014). These findings are also reported in other literature (Ali et al., 2000; Hudelson, 1993). Probably, living in rural areas is associated with an increased likelihood of use of dispenser treatment because of poor infrastructure and limited Government health care resources. In the rural communities, poor infrastructure, cost and distance to health facilities presented additional barriers to ORS use in one study in Kenya (Blum, et al, 2011).

The results regarding the mother's management of diarrhea suggest that cost of the healthcare services is an important factor in the use of ORT and treatment from the dispensary. This study findings suggest that ability to pay for the health care services may still serve as a barrier to manage childhood diarrhea in mothers with poor socioeconomic status (Ali et al., 2000).

Implications of Findings

This study highlighted the need to increase awareness among the mothers for the diarrheal disease knowledge and identifying of alarming signs and symptoms in children so that mothers can manage it readily at home with increase fluids and continued feedings. Importantly, in the rural residence, the more access to dispenser for diarrheal treatment provide another avenue for educational interventions for mothers of sick children. Families can easily reach to dispenser in less cost and it can be a valuable finding for the policy makers and public health advisors to promote ORS rehydration through these channels. The dispenser are relatively cheaper to train and do not require any lengthy study period, a lot could be trained to serve in underserved areas.

Substantially, more research is needed to assess the knowledge and behavior patterns of mothers for managing childhood diarrhea in the local context of their cultural and religious background.

Some limitations must be considered in the interpretation of the results from this study. Limitations of data collection and quality are noteworthy. Especially in some rural area, it was hard to collect all information from household's mothers due to female privacy and other religious issues. Furthermore, the researcher could not go to each home due to law and regulation issues in some areas (DHS, 2012-13). For the in-depth study of maternal care of childhood diarrhea, there might be new challenges to health care professionals to pursue and adoption of more simple, effective ways of prevention of communicable diseases in this region.

Conclusion

In conclusion, these results show the importance of promoting healthy behavior in mothers with poor socioeconomic status through household health education sessions, for proper management of childhood diarrhea. These findings are consistent with other related studies in this region and have its implications for future researchers and child health policy- planners. There is a need of a well-organized government program to ensure the continued supply of ORS, training and education of health workers so that the mortality and morbidity related to diarrheal illness can be prevented in Punjab, Pakistan.

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