



## EXPLORING AWARENESS AMONG MOTHERS OF CHILDREN 1-5 YEARS OF AGE REGARDING IDENTIFICATION, AND TRANSMISSION OF CHOLERA

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### Abstract

**Background:** Cholera is a global issue, presenting mostly in developing regions. Though it affects all ages, however, the incidence among children under 1-5 years old is 2-4 times higher than the rest of the population. Mothers' knowledge of cholera plays a key role in its prevention. Hence, the study objective was to determine the awareness among mothers of children 1-5 years old regarding identification, and transmission of cholera.

**Methodology:** A cross-sectional study was conducted from January 2020 to February 2021 in five big cities of Pakistan. The public health facilities of Lahore (Jinnah Hospital, Children Hospital, Lahore General Hospital, and Services Hospital), Kasur (DHQ Hospital), Gujranwala (DHQ Hospital), Sheikhpura (DHQ Hospital), and Faisalabad (DHQ Hospital) were selected randomly. The 800 children's mother visited the health facility for cholera were included in the study. The knowledge on identification and transmission was collected through a previously published validated tool. The chi-square test was used to determine the association between variables. A p-value of  $\leq 0.05$  is considered significant.

**Results:** The results showed that less than 50% of mothers were aware of identification signs/symptoms and the spread of cholera. While only 48% of mothers were aware of the route of transmission of cholera. A significant association ( $P=0.03$ ) was found between the sex of children and mother knowledge regarding cholera transmission. Another significant association ( $p=0.04$ ) was found between mothers' level of education and cholera transmission.

**Conclusion:** Mothers have insufficient knowledge regarding the identification and transmission of cholera among children. Community-based health education programs should be held regularly to disseminate cholera.

**Keywords:** Cholera, Mothers, Identification, transmission, Children.

## 1. INTRODUCTION

Cholera is an ancient disease and a threatening public health problem in developing regions across the globe (Deen, Mengel, & Clemens, 2020). It is an acute infectious disease of the small intestine caused by the gram-negative bacterium *Vibrio cholera* (Meszaros, Miller-Dickson, Baffour-Awuah, Almagro-Moreno, & Ogbunugafor, 2020). The global incidence is still high with 1.3-4.0 million cases reported annually leading to 21000 to 143,000 deaths reported in 2015 (Ganesan, Gupta, & Legros, 2020). It is estimated that about 66 million population is at risk of cholera worldwide (Islam, Clemens, & Qadri, 2018). Pakistan is one of the ten cholera-prone Asian countries (Ahmed et al., 2018) in which cholera is presenting as an endemic disease (Zeb, Gulfam, & Bokhari, 2020). Outbreaks occur specifically in the summer season (Akram, 2018). Yet, other factors preceding the disease are congestion, poverty, contaminated water or food, and lack of sanitation facilities (Al-Sakkaf, Bahattab, Basaleem, & Hygiene, 2020; Meszaros et al., 2020).

Globally, the six pandemics of cholera were spread from 1817–1923 and the recent pandemic was in 1961 (Davies, Bowman, & Luby, 2017). The knowledge on early identification and transmission of cholera is important to control its outbreak (Rosdi, Rahman, & Haque, 2019). Though, cholera affects all age groups but children 1-5 years of age are more at risk with case fatality rate is also high (Islam et al., 2018). While early identification is the key factor for effective management that reduces morbidity and mortality. According to World Health Organization, the case fatality rate can be reduced by < 1% through timely identification and quality care (Yakum et al., 2017).

Children are the most vulnerable group of the population and depend on adults for food, water, shelter, and hygiene. In most cases, cholera is being transmitted through inadequate knowledge of hygienic food, water, sanitation, and personal hygiene (D'Mello-Guyett et al., 2020). Mothers are the primary caretaker of their children. Therefore, a mother's knowledge of early identification and transmission factors of cholera is important. It acts as a barometer on which child and whole family health depend. Hence, the study aim was to determine the awareness among mothers of children 1-5 years old regarding identification, and transmission of cholera. Since little data is available internationally, while no study was previously conducted in Pakistan that explores mother's knowledge on cholera identification and its transmission. Further, the study was conducted in five big cities of Pakistan to maximize its generalizability.

### 1.1 Objective

- The study objective was to determine the awareness among mothers of children 1-5 years old regarding identification, and transmission of cholera.

## 2. MATERIAL AND METHODS

A cross-sectional descriptive study was conducted from January 2020 to February 2021 at government health facilities of 5 major cities of Pakistan. The cities were selected through random sampling including Lahore (Jinnah Hospital, Children Hospital, Lahore General Hospital, and Services Hospital), Kasur (DHQ Hospital), Gujranwala (DHQ Hospital), Sheikhpura (DHQ Hospital), and Faisalabad (DHQ Hospital). The 800 mothers (100 from each hospital) of children having age 1-5 years and suffering from cholera were included in the study. The mothers who gave informed consent and the children who found positive on rapid cholera dipstick test were included. The mothers had children more than five years of age and visiting health facility with other family members were excluded from the study. The written informed consent was taken from all the parents before data collection. Reassurance was provided that all the data was kept confidential.

The data was collected through a previously published validating questionnaire (Orimbo et al., 2020). The tool was further tested on a 10% population through a pilot study. The pilot study population was not included in the final study. The questionnaire consists of two parts. The demographic part including information on the age of the child, sex of the child, mother's educational status, mother's occupation, total family income, source of water, the problem with

sewage, hand washing, and washing of raw fruits and vegetables. While the knowledge part contains questions on signs and symptoms of cholera and its transmission.

The data analysis was done through the statistical package of social sciences 22. Descriptive statistics were used to express data. Qualitative variables were expressed in frequencies and percentages while quantitative variables were expressed as mean and standard deviation. The Chi-square test was used to determine the association between two variables. A p-value of  $\leq 0.05$  was considered significant.

### 3. RESULTS

The 800 mothers of children age 1-5 years were included in the study. Out of 800 children, 272 (34.0%) had children 1-2 years old, 80 (10.0%) had 2-3 years old, 312 (39.0%) had 3-4 years old, and 138 (17.0%) had 4-5 years old children. The 280 (35.0%) mothers were illiterate, 152 (19.0%) had primary education, 208 (26.0%) studied up to middle class and 160 (20.0%) mothers had education matric and above. The 232 (29.0%) mothers were working women and 568 (71.0%) were housewives. The 104 (13.0%) had family monthly income less than 10000 rupees per month, 576 (72.0%) had 10000-20000 rupees and 120 (15.0%) had more than 20000 rupees. The 696 (87%) had a government water supply and 104 (13%) had a hand pump. The 536 (67.0%) had problems with sewage while 264(33.0%) respondents had no problem with sewage. The 416 (52.0%) said they wash their hands before preparing and serving food while 384 (48.0%) mothers said they don't wash their hands. The 488 (61%) mothers said they wash raw fruits and vegetables before serving and 312 (39%) said they don't wash fruits and vegetables (Table 1).

**Table 1.** Characteristics of study Participants

Variable	Frequency	Percentage
<b>Having age of Children</b>		
1-2 years	272	34%
Above 2-3 years	80	10%
Above 3-4 years	312	39%
Above 4-5 years	136	17%
<b>Sex of Children</b>		
Male	456	(57.0%)
Female	344	(43.0%)
<b>Mother's Educational Status</b>		
Illiterate	280	35%
Primary	152	19%
Middle	208	26%
Matric and above	160	20%
<b>Mother's Occupation</b>		
Working women	232	29%
Housewives	568	71%
<b>Total Family Income</b>		
Less than Rs.10,000	104	13%
Rs.10,000-20,000	576	72%
More than Rs.20,000	120	15%
<b>Source of Water</b>		
Government supply	696	87%
Hand Pump	104	13%
<b>Problems with Sewage</b>		
Yes	536	67%
No	264	33%
<b>Hand Washing</b>		
Yes	416	52%
No	384	48%
<b>Washing of Raw Fruits &amp; Vegetables</b>		
Yes	488	61%
No	312	39%

Results showed that out of 800 mothers, 64 (8.0%) said nausea is a sign and symptom of cholera, 344 (43.0%) said vomiting, 16 (2.0%) said hypotension and 376 (47.0%) mothers said watery diarrhea of quick start with “rice appearance” is a sign and symptom of cholera (Table 2).

**Table 2.** Frequency Distribution of Knowledge of Mothers regarding Sign and Symptoms of Cholera

Sign and Symptoms	Frequency	Percentage
Nausea	64	8.0%
Vomiting	344	43.0%
Hypotension	16	2.0%
Watery diarrhea of quick start with “rice appearance”	376	47.0%
Total	800	100.0%

Out of 800 mothers, 552 (69.0%) believed that contaminated food is a leading cause of transmission of cholera, and 200 (25.0%) mothers said contaminated water while 48 (6.0%) mothers said both the contaminated food and water are the causes of cholera (Table 3).

**Table 3.** Frequency Distribution of Mothers regarding Knowledge of Transmission of Cholera

Transmission	Frequency	Percentage
Contaminated food	552	69.0%
Contaminated water	200	25.0%
Both	48	6.0%
Total	800	100.0%

Out of 800 mothers, 552 knew that contaminated food can transmit cholera, 168 (21.0%) were illiterate and 384 (48.0%) were literate. Among 200 mothers who knew that contaminated water can transmit cholera, 72(9.0%) were illiterate and 128 (16.0%) were literate. Among 48 mothers who knew that both (contaminated food and water) can transmit cholera, 8 (1.0%) were illiterate and 40 (5.0%) were literate. The result was found statistically significant as the p-value was 0.04 found.

**Association of Mothers’ Knowledge regarding Factors Responsible for Causing and Spread of Cholera with Mothers’ Educational Status**

Knowledge of Mothers regarding Transmission	Mothers’ Educational Status			P-value
	Illiterate	Literate	Total	
Contaminated food	168 (21.0%)	384 (48.0%)	552 (69.0%)	0.04
Contaminated water	72 (9.0%)	128 (16.0%)	200 (25.0%)	
Both	8 (1.0%)	40 (5.0%)	48 (6.0%)	
Total	280 (35.0%)	520 (65.0%)	800 (100.0%)	

Among 552 mothers who knew that contaminated food can transmit cholera, 344 (43.0%) had male children and 208 (26.0%) had female children. Among 200 mothers who knew that contaminated water can transmit cholera, 72 (9.0%) had male children and 128 (16.0%) had female children. Among 48 mothers who knew that both (contaminated food and water) can transmit cholera, 40(5.0%) had male children and 8(1.0%) had female children. The result was found statistically significant as the p-value was 0.03.

**Association of Mothers’ Knowledge regarding Factors Responsible for Causing and Spread of Cholera with Sex of Children**

Knowledge of Mothers	Sex of Children			P-value
	Male	Female	Total	
Contaminated food	344 (43.0%)	208 (26.0%)	552 (69.0%)	0.03
Contaminated water	72 (9.0%)	128 (16.0%)	200 (25.0%)	
Both	40 (5.0%)	8 (1.0%)	48 (6.0%)	
Total	456 (57.0%)	344 (43.0%)	800 (100.0%)	

#### 4. DISCUSSION

Cholera is a fatal public health disease specifically in developing countries. Children are more susceptible to this disease. Lack of hygiene practices, unclean environment, poverty, contaminated food, and water are major factors responsible for cholera. While knowledge plays an important role in its prevention. Therefore, the current study aims to measure the knowledge of mothers who had children, 1-5 years old, visiting health facilities located in Lahore, Kasur, Gujranwala, Sheikhpura, and Faisalabad for cholera. The study found that the educational status of the mothers was unsatisfactory because only 160 (20.0%) mothers had education matric and above. While only 29.0% of mothers were working women and 71.0% were housewives. The findings of this study are contradictory to the study conducted by Srilaxmi et al. (Srilaxmi, Inbarathi, & Gomathi, 2017) at Israelpet among mothers of children age 1-5 years. The study reported that 32% of mothers had education at the matric level and 43.3% were housewives. This difference may be due to differences in geographical areas and culture in our study.

Adequate monthly income plays a significant role and helps people to keep their home environment neat and clean. The study revealed that more than half (72.0%) had to earn 10000-20000 per month while only 15.0% had a monthly income of more than 20000/-. The results are in align with a previous study conducted by Workie et al. (Workie, Sharifabdilahi, & Addis, 2018) in Diredawa among 295 mothers who had children age 1-5 years and reported that 106 (35.9%) mothers reported family income less than 1000 Binned.

The study showed that a significant majority (87.0%) of mothers had a government water supply while only 13.0% had hand pumps for water. The results are contradictory to the Kazaji (Kazaji, 2015) study who demonstrated that a massive portion of the respondents obtained water from rivers and streams while a few of them had piped/tap systems for water supply.

The study reported that out of 800 mothers, 64 (8.0%) said nausea is a sign and symptom of cholera, 344 (43.0%) said vomiting, 16 (2.0%) said hypotension, and 376 (47.0%) mothers said watery diarrhea of quick start with "rice appearance" is a sign and symptom of cholera. The results are contradictory to a previous study conducted at Diredawa. The study objective was to determine knowledge regarding water-borne diseases among mothers of children had age 1-5 years. The study found that more than half (65.2%) mothers had a good level of knowledge. This difference may be due to a small sample size than our study.

The study finds that out of 800 mothers, 552 (69.0%) believed that contaminated food is a leading cause of transmission of cholera, and 200 (25.0%) mothers said contaminated water while 48 (6.0%) mothers said both the contaminated food and water are the causes of cholera. The results are similar to a previous study conducted by Nsagha et al. (Nsagha et al., 2015) in the Buea Health district of Cameroon. The study indicated that 38.2% of respondents were aware that contaminated food is a cause of cholera transmission, 29.4% said contaminated water, 20.6% said poor sanitation, and 17.6% said contact with the infected individual.

Another important finding of the study was the significant association ( $P=0.03$ ) between the sex of children and mother knowledge regarding cholera transmission. The results were in the same line with the study conducted by Wahed et al. (Wahed et al., 2013) in Bangladesh. The study reported a significant association between level of knowledge and sex among respondents. Furthermore, a significant association ( $p=0.04$ ) was found between mothers' level of education and cholera transmission. The results were in accordance with a previous study conducted by Orimbo et al. in Kenya. The study reported that formal education is associated with a high knowledge score on cholera. Yet, the study is not without limitations. As it was a cross-sectional study that included only mothers, therefore, results may not be generalized to the population in which fathers are responsible for taking care of children. Further, the other important variables such as attitude and practices were beyond the scope of our study.

## 5. CONCLUSION

Mothers have insufficient knowledge regarding the identification and transmission of cholera among children. Community-based health education programs should be held regularly to disseminate knowledge on cholera. These programs should focus on early identification, prevention, and treatment of cholera among children. Future, studies should explore the variable with the addition of attitude and practices and including a more diverse group of population.

## 6. AUTHORS' CONTRIBUTIONS

ML conceives the idea, wrote the initial draft of manuscript, contributing in data extraction and reviewing process. IL act as a coauthor in the data analysis, reviewing process, and substantial contribution in the reviewing process. RS redrafted the manuscript and made a substantial contribution in the final draft of the review. RSU redrafted the manuscript, proof read all the content and approved this final version.

## 7. CONFLICT OF INTEREST

The authors declare no competing interests with each other's.

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