Assessment of Knowledge, Attitude & Practices of Plain Water and Filtered Water Consumers Regarding Occurrence of Diarrheal Diseases in Shadman Lahore

Namra Asif[1], Qurat Ul Ain Liaqat[2] and Iram Ashraf[3]
[1]Rawalpindi Medical College, Rawalpindi
Email:asafnamra@hotmail.com
[2]Woman Medical Officer THQ Silanwali, Pakistan
quratkhan25@gmail.com
[3]Woman Medical Officer at THQ Pattoki, Punjab, Pakistan
iramsmatie@gmail.com

ABSTRACT:

Objective: Conducted in Shadman and Shahjamal, Lahore this study aims at the assessment of knowledge and practices of plain and filtered water consumers regarding occurrence of water-borne diarrheal disease. In the study, water taken from WASA supply or Private Bore Pumps and Boiled water was taken to be as "Plain". While "filtered" water was standardized as water obtained either from filtration plants or from (functional, one or two chambered) house-hold filters. "Water-borne diarrheal diseases" are taken as the infectious diseases caused by fecal (animal or human) or chemical contamination of water.

Method: Lasting for a duration of two months (starting June 2017 to July 2017) , this descriptive cross-sectional study utilized systematic random sampling, with a sample size of 100. Each participant was required to fill out a pretested questionnaire. The data collected was analyzed using Statistical Package for the Social Sciences (SPSS) version 16.0.

Results: Out of total no. of people who read informative literature about water purification and diarrheal diseases, 55% used filtered water. Whereas People who did not read any informative literature, 41.9% of them used filtered water. Analytical results display a reduced occurrence of water-borne diarrheal diseases associated with filtration treatment of drinking water as compared to consumption of plain, untreated water.

Conclusion: Exposure to any informative literature had positive effect on people to use filtered water. People have little knowledge about how these diseases occur. Economic burden is the main hurdle in the way to improve the quality of water.

Keywords: Water purification, Diarrhea,

Introduction:

Water borne diseases are the infectious diseases that arise from the contamination of water by human & animal feces, urine or chemical wastes[1].

The water-related diseases are classified mainly into two main groups: **the non-infectious** and **The infectious** water related diseases. The non-infectious water related diseases- formerly known as the non-specific water borne diseases are related to some chemical property of water.

They are related to the ingestion of a harmful chemical, toxic or carcinogenic substance.

Chemical contamination of water supply for drinking and cooking can adversely affect health.

The Infectious water-related diseases are classified according to the Bradley-Feachem[5] classification into feco-oral diseases (diarrheal diseases, dysenteries, hepatitis A, and ascariasis), Water washed diseases (trachoma, scabies, and dysentery), water based diseases (worm infestations like schistosomiasis, guinea worm), water related insect vector diseases (malaria, filiariasis dengue, yellow fever, Japanese encephalitis), and water dispersed diseases (Legionnaire's disease), water borne diseases (Cholera, typhoid, leptospirosis). The major pathogens associated with water- borne diseases are Rotavirus, which causes diarrhea, HAV causes hepatitis A, Salmonella typhi causes typhoid, Vibrio cholera causes cholera, and Entamoeba histolytica causes amoebic dysentery. Clinically water-borne illnesses most commonly present as diarrhea and/or vomiting[9].

According to WHO, Diarrhea is the passage of 3 or more loose or liquid stools per day, or more frequently than is normal for the individual[13]. It is usually a symptom of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms. Severe diarrhea leads to fluid loss, and may be life-threatening, particularly in young children and people who are malnourished or have impaired immunity.88% of all the cases of diarrheal diseases are related to unsafe drinking water, poor sanitation and hygiene[7].

The WHO and UNICEF defines safe drinking water and basic sanitation as following[11]:

- **Drinking water** is water used for domestic purposes, drinking, cooking and personal hygiene.

- **Access to drinking water** means that the source is less than 1 kilometer away from its place of use and that it is possible to reliably obtain at least 20 liters per member of a household per day.

- **Safe drinking water** is water with microbial, chemical and physical characteristics that meet WHO guidelines or national standards on drinking water quality.

- Access to safe drinking water is the proportion of people using improved drinking water sources: household connection, public standpipe, borehole, protected dug well, protected spring and rainwater.

According to UNICEF report[4], about 1.1 billion people have no access to any type of improved drinking source of water. As a direct consequence:

> 1.6 million People die every year from diarrheal diseases (including cholera) attributable to lack of access to safe drinking water and basic sanitation and 90% of these are children under 5, mostly in developing countries[3]

It is estimated that in **Pakistan,** 30% of all diseases and 40% of all deaths are due to poor water quality[2]. Diarrhea, water borne disease is reported as the leading cause of death in infants and children in the country while every fifth citizen suffers from illness and disease caused by the polluted waters.

The Pakistan Social and Living Standards Measurement Survey (PSLM) 2010-11, revealed that about 91 percent of the population had access to improved drinking water[14]. The access to improved water MDG target had been set at 93 percent by 2015. Sanitation target of getting 67 percent of the population with access to safe sanitation was set. Safe sanitation has been targeted to rise from 34 in 1990-91 to 67 percent by 2015.

However, this situation could have been improved by improved water supply, sanitation, hygiene. But in Pakistan due to lack of awareness, Lack of well-equipped laboratories, lack of drinking water monitoring and surveillance programs, this situation has been aggravated.

A study therefore conducted, targeting residents of Shadman and Shahjamal Lahore to

Assess their knowledge and practices regarding the drinking water source and usage and to suggest some preventive measures to avoid such frequent occurrence of diarrheal diseases among population. Some of the operational definitions include

> **Water-borne diarrheal diseases** are the infectious diseases that arise from the contamination of water by human & animal feces, urine or chemical wastes.
> **Plain Water** is taken as untreated drinking water obtained directly from taps and boiled water.
> **Filtered Water** is taken as drinking water obtained from filtration plants or from (one or two chambered) functional filters installed in households.

Materials and Methods:

Study Design: Descriptive Cross- sectional study

Setting: Shadman and Shahjamal colony Lahore

Duration of Study: 2 months (i.e. June 2017 - July 2017)

Sampling Technique: Systematic random sampling

Sample Size: 100

It is an important technique by which each unit of a population has equal probability of being selected. So when we conducted our research the total sampling frame including houses of Shadman and Shahjamal came out to be 1000 thus with our sample size of 100 the sampling ratio came out to be N/n i.e. 1000/100 is 10.Then on random selection out of these 10 the 4th house was being selected by a draw. Hence following the 4th unit the houses selected would be 4th 14th 24th etc..

Data collection procedure: Pretested Questionnaire

Data Analysis Procedure: Data Analysis Software SPSS (version 16) & Microsoft Excel

Results:

Out of 100 individuals 49 were plain water users and 51 were filtered water users. That gave us a percentage of 49% plain water users and 51% filtered water users.

We further categorized them on the basis of whether they had any exposure to the informative literature regarding water treatment practices or water quality guidelines, out of 100 individuals 69% had read the literature while 31% did not.

The next question was asked to assess which measures did they take to filter the water ; 31% of people used boiled water,37% of people used filtered water,5% of people used chlorinated water while 27% used water without any treatment.

Each of the individual was then asked if he had suffered from any water- borne diarrheal diseases (cholera, typhoid etc) or water-borne illnesses (hepatitis A, hepatitis B) in past one year ; 42% of people suffered from the disease while 58% of people remained safe.

All of those who suffered from the disease were asked if they had changed their water source or tried to treat their water after suffering from the disease , 63% of people changed the source while 37% of people did not changed the source.

We then assessed the individuals about their knowledge on how the water-borne diseases or illnesses occur 44% of people know how these diseases occur while 56% of people did not have any idea about the occurrence of water-borne diarrheal diseases.

To estimate their knowledge about how they describe the standard pure water we gave them different categories to classify the pure water , out of 100 individuals 3% of people said that the pure water should be odourless and tasteless, 51% of people said that the water should be odourless, tasteless and colorless while 46% of people said that the pure water should be laboratory tested.

We asked the people about the difficulties encountered while trying to improve water quality 72% of people were having economic burden 28% of people were having awareness problems.

We then asked about the probable source of contamination in the area, 76% 0f people said that poor sanitation was the culprit , 17% of people said that human waste and garbage was the source of contamination and 7% of people regarded industrial waste as the source of contamination.

Out of 100 individuals 61% of people complained the authorities about the bad water quality while 39% of people remained silent .After registering complaints to the concerned authorities regarding the water quality 29% people got positive response while 71% of people did not get any response.

We made comparison between the people who made complaints to the authorities and the concomitant action taken by the authorities, 62% of the people were those who made complaints to the authorities out which 30.7% people got positive response from the authorities while 69.3% didn't get any response.

We assessed the attitude of the people by asking if they complained to authorities regarding water contamination in their area. 62% people claimed that they complained to the authorities. 38% Did not complained to authorities. Out of 62% people who complained to the authorities, only 32% said that any intervention was made by the authorities.[Figure1]

We made a comparison between exposure to informative literature and measures taken for water purification. Out of 69% people who had read any informative literature 20.28% people did no treatment to their water. However, out of the people who did not read any informative literature (31%) , 42 % of them did not use any water purification technique. Although the % of practices with knowledge is higher as compared to without knowledge but this data is unable to elicit the significant difference between use of water filtration techniques with and without knowledge.[Figure2]

The consumption of filtered water is **55.0%** in people who had read any informative literature about water purification. While it was **41.9%** in people who had not read any informative literature about water purification. Although the % of practices with knowledge is higher as compared to without knowledge but this data is unable to elicit the significant difference between use of water filtration techniques with and without knowledge.[Table1]

61.9% of the people who suffered from Diarrheal diseases changed their water source or treated their water. Whereas **63.7%** of people who did not suffer from any diarrheal disease also treated their water or changed their water source. However the above data does not show any significant statistical association between changing the water source after occurrence of disease.[Table2]

Discussion:

Preventable water- borne diarrheal illnesses continue to be a dilemma for Preventive Health workers as they persistently take a higher toll in mortalities and morbidities. Annually there are about 4 billion cases of diarrheal diseases leading to about 1.8 million deaths worldwide, with 90% mortalities including children less than 5 years of age. Accounting to a total loss of about 443 million school days and an equivalent of 117 DALYs (Disability Adjusted Life Years) annually . Lack of safe drinking water and good standards of sanitation and hygiene are the leading causes of diarrheal diseases worldwide. Globally 884 million people lack access to improved drinking water sources, adding to the global burden of disease.

However, effective treatment of drinking water at point-of-use (POU) and point-of-consumption can significantly lower the occurrence of preventable diarrhea.

In our study assessment of Knowledge, Attitude and Practices regarding Diarrhea and water purification was made, of People living in Shahjamal and Shadman Lahore. It showed higher percentage of people using Filtered water who had knowledge about the causes of diarrheal diseases and water purification

Also Practices of People were assessed as most of the people after suffering from diarrhea changed their water source or started treating it.

Most of the people think that the hurdle in improving the water quality was Economic burden.

Attitude of People were assessed by knowing if they complained to authorities regarding Unclean and polluted water in their locality. Most of them complained to authorities but authorities did not apply proper interventions to address this issue.

Complaint made to authorities v/s Steps Taken by the Authorities
**Figure[1]**
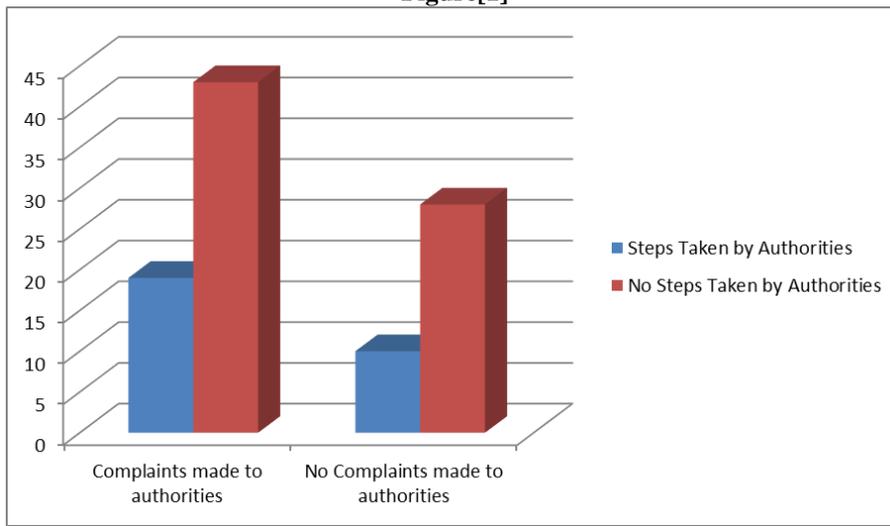
Statistical Analysis

 P value for Fisher's Exact Test=0.821 (p>0.05)

Inference: **62%** people say they have complained to authorities regarding contamination of water in their area. Out of these **69.3%** People are of the opinion that authorities have never responded with proper interventions. Only 29% people say that authorities have taken steps for water purification in their area. It shows significant loss of confidence in people about authorities.

Exposure to Informative Literature V/s Measures Taken for Water Purification
Figure[2]
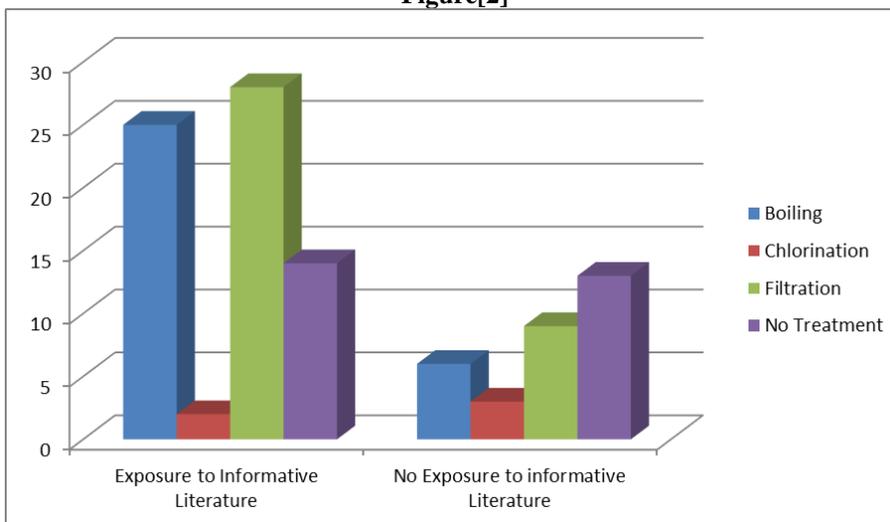
Statistical Analysis: P-value for Pearson chi square=0.348 (p>0.05)

Inference: The use of water purification techniques is higher in people who read informative literature about safe and clean water. Whereas people who did not come across any informative literature **42%** of them did not used any water purification technique. Although the % of practices with knowledge is higher as compared to without knowledge but this data is unable to elicit the significant difference between use of water filtration techniques with and without knowledge.

Source of Water V/s Exposure to Informative Literature

Table[1]

Informative Literature	Frequency /Percentage	Source of Water		Total
		Plain Water	Filtered Water	
Yes	Frequency	31	38	69
	%	44.9%	55.0%	100.0%
No	Frequency	18	13	31
	%	58.1%	41.9%	100.0%

Statistical Analysis

P value for Fisher's Exact Test=0.281 (p>0.05)

Inference: The consumption of filtered water is **55.0%** in people who had read any informative literature about water purification. While it was **41.9%** in people who had not read any informative literature about water purification. Although the % of practices with knowledge is higher as compared to without knowledge but this data is unable to elicit the significant difference between use of water filtration techniques with and without knowledge.

Suffered From Diarrheal disease V/s Changing/ Treating the water

Table[2

Suffered From Diarrheal Disease	Frequency /Percentage	Changed water source/ Treated water		Total
		Yes	No	
Yes	Frequency	26	16	42
	%	61.9%	38.09%	100.0%
No	Frequency	37	21	58
	%	63.7%	36.2%	100.0%

Statistical Analysis

P value for chi square Test=0.847 (p>0.05)

Inference:**61.9%** of the people who suffered from Diarrheal diseases changed their water source or treated their water. Whereas **63.7%**of people who did not suffer from any diarrheal disease also treated their water or changed their water source. However the above data does not show any significant statistical association between changing the water source after occurrence of disease.

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