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HOUSEHOLD CHARACTERISTICS AFFECTING DRINKING WATER QUALITY AND HUMAN HEALTH

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Pakistan's water crisis, especially serious water shortages have had a great impact on the health of the general population. Today majority of Pakistanis have no access to improved water sources which force people to consume polluted drinking water that results in the shape of waterborne diseases. In addition to this, household characteristics, includes mother's education and family income, also have an impact on drinking water quality and ultimately on human health. This study was conducted in three districts of Province Punjab both in urban and rural areas. The sample size of this study was 600 females of age group 20-60 years. From the data, it was concluded that mother's education and family income were affecting drinking water quality and human health. As the mother's years of education increased, the health issues decreased. Similarly, as the level of income increased, people suffered from water related diseases decreased.
Keywords: Drinking water, quality, health

INTRODUCTION

Approximately 1.1 billion people around the globe lack access to an improved water sources. Even for those who do have access to water, unsanitary handling and storage means that household water for drinking and food preparation is often unsafe. Unsafe water and hygiene practices are responsible for the majority of diarrheal diseases, which are a leading killer of children under five and account for approximately 2 million deaths of children every year. Water-borne infections such as cholera, typhoid fever, and dysentery also burden the public health system and can impose significant economic losses (UN Commission on Sustainable development, 2004).

According to a National Conservation Strategy study, about 40% of diseases in Pakistan are water borne. The report also mentions that 25-30% hospital admissions are connected to water-borne bacterial and parasitic conditions, and healthy life expectancy can be increased by 5 to 10 years if governments and individuals work together to reduce major health risks in each region (The Network, 2003). The issue of clean drinking water is extricable linked to sanitation and hygiene. If human waste is not treated or disposed of properly, it can contaminate a water source that is used for drinking. If a woman places clean water from a well into dirty container, it is no longer clean. If people do not practice hand washing, they may lose whatever benefits they might have derived from clean drinking water and sanitation facilities. (Fritschel, 2002).

The present study was designed to explore how household characteristics (Mother's education & family income) affect drinking water quality and human health.

The main thirst of this study was to address the following objectives.

- To look into the family income of the respondents' and its effect on drinking water quality and their health outcomes.
- To inspect the effect of female education (respondent) on drinking water quality and their health outcomes.
- To suggest policy recommendations for policy makers to formulate the policies for the efficient handling of limited freshwater resources and its quality.

MATERIALS AND METHODS

Cross sectional study was conducted in the province of Punjab. According to 1998 census, the Punjab is the most populated province of Pakistan, with 72.6 million people (Encarta, 2007). A sample size of 600 females of age group 20-60 years was selected.

At first stage, three districts namely, Toba Tek Singh, Multan and Rawalpindi were purposively selected on the basis of PCRWR report in which those cities of bad quality are mentioned and then one urban and rural area was selected from each of the districts through simple random sampling. Systematic random sampling was used to select every Nth household and the sampling unit was a female of age group 20-60 years.

A well-structured interview schedule was constructed to investigate that how household characteristics affect drinking water quality and human health in Punjab, Pakistan.

The data collected was analyzed through using descriptive and inferential statistics. The descriptive statistics include frequency distribution and measures of central tendency and dispersion while for drawing inference; the bi-variant technique was applied. Among the bi-variate techniques, the cross analysis, different tests for significance such as Chi-square, Phi test, were used to explore the relationship among the variables under investigation.

RESULTS AND DISCUSSIONS

Table 1. Distribution of the respondents according to female education

Female education	Frequency	Valid percentage
Illiterate	253	42.2
Primary	29	4.8
Middle +Matric	103	17.2
Intermediate	42	7.0
Graduate>	173	28.8
Total	600	100.0

The above Table 1 shows that 42.2% respondents were illiterate as fifty percent of our data is from rural background and this data also emphasized to have a look on study area's where literacy rate is very low especially among females and 28.9% respondents were graduated and above. This figure showed the ongoing trend of higher education among females. While 24.2% of the respondents were middle to intermediate (i.e.17.2%+7.0%). However, only 4.8% respondents had primary qualification.

Table 2. Distribution of the respondents according to household income

Household income (Rs. in thousands)		Frequency	Valid percent
<5000	Low	82	13.7
6-16	income group	100	16.7
11-15	Medium	166	27.7
16-20	income group	209	34.8
21-25	High	40	6.7
>26000	income group	3	.5
Total		600	100.0

Household income also plays very important role for a healthy life. Table 2 indicates that 30.4% households belonged to low income group while 62.5% households belong to medium income group. And only 7.2% households fall into high income group.

Table 3 illustrates that 253 out of 600 respondents were illiterate. Amongst those, almost fifty percent respondents reported that households were becoming ill and similar trend was followed where mothers were educated up to primary level. Similar results were shown by a nationwide survey of NIPS (1992) where it was reported that prevalence of diarrhea was lowest when the mother had followed secondary or higher level of education. However a primary education did not lead to a significant decrease in diarrhea.

While 173 respondents were having graduation or above level, out of them, a majority of respondents i.e. 71.7% reported that their households were not suffering from water related disease. This depicted the impact of female education on family's health and with the increase in education, health status become improved.

These results also supported the idea of Esrey and Habicht (1998) that the family health was dependent on mother's education. According to Esrey, the effect of toilets & piped water on infant mortality was dependent on whether or not mothers were literate. The author illustrated that literate mother protected their infants especially in unsanitary environments lacking toilets and that when piped water was introduced, they used it more effectively to practice better hygiene for their infants. Similarly, mother years of education were often found to be positively correlated with improved child health in developing countries (Glewwe, 1999; Boadi and Kuitunen, 2005).

Table 4 shows that majority of households having less than <Rs.5000 income level (60 out of 82(73.2%) and Rs.6000-10,000 [82 out of 100(82.0%)] were getting ill as compare to medium income level [96 out of 375(25.6%)] and high income level [7 out of 43 (16.3%)]. As the level of income increased, the incidence rate of diseases decreased and vice versa. Pritchett and Summers (1996) also supported the above results, that low income caused ill-health. More the family income, more the chances to improve drinking water quality. For instance, water treatment & hygiene practices etc which had great impact on health status.

FWR (2000) also mentioned a factor of Poor health which was lack of toilet and the reason given for not having a toilet was that the household did not have the money to build one. Furthermore, World Bank (1999) also illustrated that poverty and ill-health were intertwined. Poor people had worse health outcomes than better-off people.

Table 3. Relationship between the female education and health outcome

Health outcome	Illiterate	Primary	Middle and Matric	Intermediate	Graduation and above	Total
Suffered	124 49.0%	14 48.3%	36 35.0%	23 54.8%	49 28.3%	246 41.0%
Not suffered	129 51.0%	15 51.7%	67 65.0%	19 45.2%	24 71.7%	354 59.0%
Total	253 100.0%	29 100.0%	103 100.0%	42 100.0%	173 100.0%	600 100.0%

Statistics Chi Sq = 23.686, P ≤ 0.0001 Phi = 0.199, P ≤ 0.0001

Table 4. Relationship between the household income (Rs. in thousands) and health outcome

Health outcome	Low income group		Medium income group		High income group		Total
	<5000	6-10	11-15	16-20	21-25	>26000	
Suffered	60 73.2%	82 82.0%	52 31.3%	45 21.5%	7 17.5%	0 0.0%	246 41.0%
Not suffered	22 26.8%	18 18.0%	114 68.7%	164 78.5%	33 82.5%	3 100.0%	354 59.0%
Total	82 100.0%	100 100.0%	166 100.0%	209 100.0%	40 100.0%	3 100.0%	600 100.0%

Statistics Chi-Sq = 154.963, P ≤ 0.0001 Phi = 0.508, P ≤ 0.0001

CONCLUSION AND RECOMMENDATIONS

This whole study reveals an association between the household characteristics and drinking water quality and health outcome. In this study, household characteristics include mother's education and household income level. Briefly, we can say that with an increase in mother's years of schooling; lower the number of people suffering from water related diseases. Likewise, higher the family income results in decreased level of water borne diseases.

Keeping in view the results, following are the recommendations;

1. Government should take steps on emergent basis to increase the literacy rate especially amongst female to improve the family health status.
2. Government should start a media campaign to create awareness among mothers about improving water quality and health status.
3. More filter plants should be installed because low family income can't afford water filters at home. It will help in reducing the water borne diseases.
4. Awareness should be generated about the measures like water boiling before usage. Because it is a very cheap and healthy practice, a low income family can also adopt at home.

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