ORIGINAL ARTICLE

HEALTH IMPACT CAUSED BY POOR WATER AND SANITATION IN DISTRICT ABBOTTABAD

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Background: Large proportions of people still do not have excess to safe drinking water and proper sanitation. **Methods:** Qualitative and quantitative approaches were used to assess the health impacts. Random households were selected. Information was collected from questionnaire through interview schedule method, group discussion and observation checklist. **Results:** People rated water and sanitation condition in urban as: 10% very good, 27% good, 20% bad, 43% very bad, and none of them said we don't know. While in rural areas they rated 10% very good, 36% good, 44% bad, 6% very bad, and 4% of them said we don't know. Water sources in selected urban and rural areas were different, 37% in urban and 68% in rural area depended on bore wells as water source, 22% depended on hand pumps. In urban areas, the disease ratio was typhoid 20%, hepatitis 13%, diarrhoea 27%, skin infection 23%, stomach problems 53% and allergies 33%. In rural areas, after stomach problems, diarrhoea, hepatitis and typhoid ratio was very high as compared to urban area. In rural community, 70% were unaware of poor water and sanitation consequences on health. **Conclusion:** The water and sanitation condition in urban as well as in rural community is poor but in rural community it is even worse. The drinking water was contaminated with *E. coli*, Enterobacter, Salmonella and Clostridium. This observation was correlated with prevalence of many water born diseases especially in rural communities of Abbottabad.

Keywords: Safe drinking water, health impacts, environmental awareness, water borne diseases, water and sanitation.

INTRODUCTION

The second most important risk factor for poor health is lack of clean water and poor sanitation and it has major health impacts.[1] There are many ways by which pathogens infect individuals through water causing: water-based diseases, water-washed diseases, water-borne diseases, water-dispersed infections, and water-related vector-borne diseases. Infectious diseases include water born and water washed diseases, cholera, ameobiosis, shigellosis, salmonelloses are all infectious diseases.[2]

In developing countries, the poor people have a great burden of diseases due to inadequate water supply, sanitation and hygiene.[3] The United Nations Millennium Declaration, in particular its eighth Millennium Development Goal, reflects the global importance of water sanitation and hygiene for development, poverty reduction and health.[4] Governments are unable to provide basic needs to the citizens, because of the rapid increase in the urban population.[5] Compared to rural households, urban households have 135% improved sanitation facilities and 30% have improved water source in developing countries.[6] In Asia, the water supply and sanitation coverage is 81% and 48%, respectively.[7] People of rural and urban areas in Pakistan especially the poor face many waterborne diseases such as typhoid, dysentery, cholera and diarrhoea due to increasing population and unhygienic surroundings, increase in solid waste generation. Crowded housing and the Water and Sanitation (WATSAN) facilities demand is also increasing day by day.[8] One of the neglected sectors in Pakistan is WATSAN. In Pakistan, mostly people do not have sanitation facilities and access to safe drinking water.[9]

In Pakistan, as of 2005, 50.7 million people lack access to adequate sanitation facilities and 38.5 million people do not have access to safe drinking water source. If such condition persists by the year 2015 in Pakistan, 43.2 million people will have no access to adequate sanitation facilities and 52.8 million people will be without safe drinking water.[10] Current population of Pakistan is 150 million, 85% of people are living in urban while 55% are in the rural areas, only 65% have access to safe drinking water out of the total population. Sanitation facilities are available to 42% of population, of which 30% rural and 65% urban.[11] In KPK, 90% of people are living in rural areas, and the population that live in poverty is more then 36%.[12] The people health can be improved in three ways in developing countries: improvement in the quality and quantity of drinking water, and safe disposal of human excreta by providing sanitation facilities.[13] Global morbidity rate is 4 billion per year, of which 30% (1.2 billion/year) are due to contaminated water.[14]

MATERIAL AND METHODS

Both qualitative and quantitative methods were used in the research. Researchers applied the following approaches:

For secondary data visited different government like UC secretary office, DHQ, BHU

Mirpur and non-government department like SANGI and SRSP (Sarhad Rural Support Program). Field visits to one rural and one urban area of District Abbottabad were also carried out in union council Mirpur, Basti Lal Khan (rural area) and Musa Zai Colony (urban area). Fifty households from rural area and 30 households from urban area were randomly selected to conduct interviews through questionnaire. Interview schedule method with the questionnaire was used that helped in knowing the exact real situation and the suffering of the people. Two Group discussions in each area were done with the respondents for valid data collection.

RESULTS

Figure-1 illustrates the current situation of WATSAN in the study area. As a whole, the WATSAN condition of the city was very poor and alarming. Respondents have different views in rating WATSAN condition. In urban area, 10% said it was very good, 27% good, 20% bad, 43% very bad and none of them said we didn't know, every person was well aware about the condition. While in rural areas, they rated WATSAN condition as 10% very good, 36% good, 44% bad, 6% very bad and even 4% of them said 'we didn't know', they showed no concern.

As there are different causes of poor condition of sanitation, in which government is responsible or people themselves are responsible for it because in some cases people have facilities from the government but they are not properly utilising it, and there can be so many reasons for that but people in urban and rural areas have different perception about who was responsible for the poor condition of sanitation. In urban areas, 57% attributed poor WATSAN to the government, 40% was because of the people them selves and 3% said that we didn't know. While in rural area 56% people said because of government, 26% said people themselves were responsible for that and 18% said they didn't now anything.

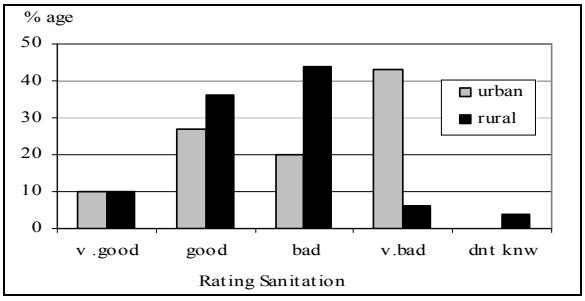

Figure-1: Perceptions about the water and sanitation conditions

There are different practices that people currently doing in managing garbage and grey water, and the practices are mostly same with slight differences in that; for example, in urban area 83% people through garbage in the fields/plots, and 17% in near by dead stream. While talking about grey water 93% in streets and 7% people have grey water connection to septic tank along with black water. In rural area 64% garbage is thrown in the fields, 26% in nearby dead stream, 10% in fields then burn the garbage. Seventy percent of grey water was found in streets, 22% in fields and 8% in nearby dead stream. In terms of sanitation facilities 37% people have proper street drains and street pavements by government and 63% do not have access to such facilities in selected urban area. In selected rural area 26% of the people have drains and street pavement facility that is being provided by NGO's (SRSP), while 74% still are deprived of this facility. There are different water sources in selected urban and rural areas and people dependency rate on the source are, 37% in selected urban and 68% in selected rural area depends on bore wells as water source for themselves, 22% depends on hand pumps as water source while 10% depends on tape water in selected rural area. Sixty-three percent of people in selected urban area depended on tape water (Figure-2).

Almost all people were happy that their water sources fulfil their needs and that water was clean and feasible for drinking, except few who said only in summer season they have problem in getting enough water from their sources, and in rainy season they have problem because of the water become turbid in that season soon after rain.

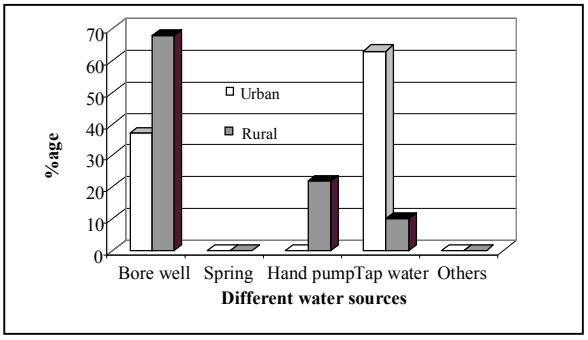

Figure-2: Sources of water in the study areas

In selected urban area only 40% people tested water for themselves and 60% never tested water for themselves. While, in selected rural only 12% tested water for themselves and 88% did not test water for themselves and they were using water for drinking purpose, those who did not test water they said only we said its safe because it seem clean, have no smell and sometimes no mud/turbidity. If water is contaminated people are not ready to believe it, whether tested or not they are 100% confident that their water is safe for drinking. Thirty percent of people uses traditional methods for cleaning water and 70% people do not use any method for cleaning water in selected urban area, in which 17% prefer boiling method and 3% uses tablets

for cleaning water where as in selected rural area 94% people are not at all using any method to treat water only 6% are treating water through boiling.

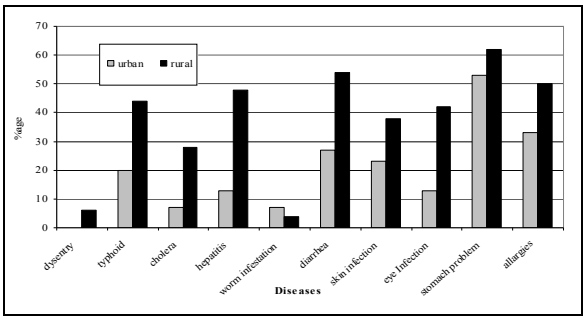

Figure-3: Disease prevalence ratio in study areas

The disease ratio in selected urban and rural area is shown in Figure-3. It was evident that in urban area the disease ratio was: typhoid 20%, cholera 7%, hepatitis 13%, worm infestation 7%, diarrhoea 27%, skin infection 23%, eye infection 13%, stomach problems 53% and allergies 33%. The most prevailing disease was the stomach problems then allergies, diarrhoea, skin infections and typhoid and so on. In 2002 it was reported that many of the diseases like typhoid, malaria and diarrhoea were due to poor water, poor sanitation, poor housing and low family income.[16] While, in rural area after stomach problems, diarrhoea, hepatitis and typhoid ratio was very high as compared to urban area.

Majority (70%) of the people are unaware of poor WATSAN consequences on health, only 30% affect their health through different ways; 4% of them get awareness through media, 2% through awareness program by NGO, 14% through education and 8% through other ways. While in selected urban area, 100% of people are well aware that poor WATSAN conditions have great health impacts. Tables-1 and 2 show the water quality analyses in the study areas.

Water contamination is very high in both the community but people are unaware of it, these microbiological contaminations are the major source of many diseases in these areas.

Table-1: Rural area drinking water sample analysis

Sources/ microorganisms	Hand pump	Hand pump	Bore well	Bore well	Bore well
E. coli	40	15	-	60	40
Enterobacter	>300	>300	>300	15	<300
Salmonella	-	-	180	10	8
clostridium	30	48	1	-	6

Table-2: Urban area drinking water sample analysis

Sources/ microorganisms	Tap water	Bore well	Bore well	Tape water	Bore well
E. coli	80	40	18	20	6
Enterobacter	>300	>300	160	120	<300
Salmonella	0	80	6	0	0
clostridium	0	0	0	0	0

DISCUSSION

People perception about the current condition of WATSAN is that majority rank it very bad, and it is attributed to the government by majority of them in rural as well as in urban areas. There were no sanitation facilities to the large number of community members like proper drainage system, street pavements, garbage collection points etc. while water is also the big issue, either not provided by the government and if is provided still is not being tested and its quantity is not enough to fulfil the needs especially in summer. Governments are unable to give basic needs to the citizens, because of the rapid increase in the urban population.[5]

Bore well, tape water and hand pumps are the basic sources of water on which people mostly depend. Water, sanitation and hygiene related diseases were significantly reduced in the U.S. and Central Europe by protecting water sources and installing sewage system by the start of 20th century. While WATSAN services in developing countries are still severally lacking, because of which millions of people are suffering from preventable diseases and even die every year.[14] People of rural and urban especially the poor face many waterborne diseases such as typhoid, dysentery, cholera and diarrhoea, due to increasing population and unhygienic surroundings, increase in solid waste generation and crowded housing and the WATSAN facilities demand is also increasing day by day.[8]

In spite of prevalence of water borne diseases, people are unable to relate it with poor WATSAN. Stomach problems, diarrhoea, typhoid, hepatitis etc are the most prevailing diseases among the people in the study area. This is also proven by the water sample analysis from urban as well as from rural areas that were totally contaminated with *E. coli*, Enterobacter, shigella and clostridium. These micro-organisms are the main cause of gastrointestinal diseases. The second most important risk factor for poor health is lack of clean WATSAN and it has major health impacts.[1] People of different age groups are badly affected from these diseases. Unawareness of the hygienic practices and poverty are also the main causes of many diseases among the people. The WHO strongly recommend on the education of girls and women as a cost effective way in improving health and better life.[15]

CONCLUSION

The water and sanitation condition both in urban and rural communities was found poor but in case of rural community it was worse. The facilities of drinking water were also scarce. The drinking water was found to be contaminated with *E. coli*, Enterobacter, Salmonella and Clostridium. Lack of awareness is the biggest cause of poor health of people in the study areas.

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