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PREVALENCE OF WATER-BORNE DISEASE IN FARMGATE SLUM OF DHAKA CITY: A CASE STUDY OF DISEASE PROPAGATION IN BANGLADESH

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Abstract

The prime objective of the present study was to evaluate the habit of drinking water and its relation to the development of diseases in the population of Farmgate slum of Dhaka city. The study has been carried out to assess the present conditions of the water supply, water-borne disease, treatment pattern, sanitation, and their overall knowledge about sanitation. The methodology of this survey consists of practical field observation and field based data collection of water supply, water-borne disease type, treatment pattern and sanitation situation through Participatory Rural Appraisal tools and questionnaire survey. During the survey, data has been collected by using a well-structured questionnaire from each households of slum. In this study 100 personnel participated where 56% population was 18-40 years age range. Their education status was below secondary level (21%) and higher level was very low (6%).The results depict that the majority of the population suffered from water related diseases such as typhoid (23%), dysentery (24%), diarrhea (91%), cholera (16%), constipation (16%), jaundice (31%), amibiasis (15%) etc. For treatment of these diseases most of them went to retail pharmacist (52%) and others went quack doctor, registered doctor, homeopathic and ayurvedic treatment. They were suffering most in rainy season (53.5%). Lack of proper knowledge about hygiene, polluted water supply, unhygienic sanitation, extreme level of poverty, dispensing medicine without the prescription are the main causes for waterborne diseases in this slum. Besides Governments, every conscious people should come forward to help them.

Keywords: *Water-borne diseases, retail pharmacy, sanitation, diarrhea.*

Introduction

Slum population has been largely increased in Bangladesh over the last three decades along with the rapid growth and expansion of towns and cities. Urban poverty is largely due to the transfer of the rural poor people to urban areas. The facilities are quite unsatisfactory for urban slum dwellers in Dhaka which is the capital of Bangladesh. Dhaka is a rapidly urbanizing city in one of the world's most densely populated and poorest countries, where approximately 30% of its more than 14 million population lives in the slums. [1] In 1951, the Dhaka city had an estimated population of 335,928 and it grew at 10.7 million in 2001 and further to 12.0 million population in 2007. [2]

The people in slum mostly live below the poverty line in terms of both calorie intake and also the cost of basic human needs. [3] The number of people living in cities without access to civic amenities has increased 60.43% in the last 17 years. As per the latest census on slum dwellers and floating population conducted by the Bangladesh Bureau of Statistics (BBS) last year, 2.23 million people live in slums across the country. [4] The major portion of the excreta is deposited into water bodies and open places which pollute water sources, general environment and the ground water. As a result, majority of the population in Bangladesh suffer from different kinds of water and excreta-borne diseases that aggravate their poverty situations. [5] The people lived in slums have no adequate knowledge about family planning, proper use of water and sanitation, environmental pollution and their impacts on humans as well on overall environments. For these reasons many water-borne diseases are spreading out in all over the country specifically in urban slum areas. [6] The impact of inadequate water and sanitation services primarily falls on the poor people. Water and sanitation related sicknesses thus put severe burdens on health services. According to the report of UNICEF and WHO among ten countries in the world Bangladesh has the highest number of child deaths due to diarrhoea. Approximately 50,800 under-five years of old children die annually in the country from diarrhoeal diseases. [7] Approximately 3.7% of DALYs (54.2 million) and 3.1% of deaths (1.7 million) worldwide are due to unsafe water, poor sanitation and poor personal hygiene (wash related diseases like diarrhea, dysentery as well as typhoid). [8] Clean drinking water is important for overall health and plays a vital role in infant and child health and their survival. [9] Some organizations are trying to improve the condition of water supply and sanitation facilities for urban poor people in different cities with different approaches. But the crisis of water supply and sanitation facilities is a common feature in daily life of urban slum. [10] This survey is aimed to link between the environmental conditions and consequent public health implications in the context of slum water pollution and sanitation as revealed after a comprehensive survey conducted during April, 2018 on Farmgate slum, Dhaka city, Bangladesh where approximately 3000 thousand people live in the slum.

Methods

The methodology of this survey consists of practical field observation and field based data collection of water supply, water-borne disease type, treatment pattern and sanitation situation through Participatory Rural Appraisal tools and questionnaire survey. The relevant secondary data for this study was collected from published papers, journals and related sources.

Study design: Community (slum) based survey was conducted.

Study area and period: The present study was experimental in nature. The present study comprises the Farmgate slum in Dhaka. The study was conducted from April 2018 to May 2018 in that slum.

Population Sources: 100 households residing in the slums of Farmgate, Dhaka.

Sample size calculation: The calculated sample size was 100. Data was collected through a well-structured experimental interview schedule.

Sampling method: Respondents were selected using random sampling techniques.

Exclusion criteria: Those people who had migrated to the target area recently or those who were not staying on permanent basis were excluded from the survey.

Data collection: Data about socio-demographic features was collected from residents of selected household through the questionnaire. Information about water-borne diseases and practices in the management of water-borne illness was collected through a questionnaire which was pre- tested and later applied to the community residing in the target sites.

Data processing and analysis: Microsoft Excel 2013, Microsoft Word 2013.

Results and Discussion

This study is carried out on 100 respondents using random sampling techniques. Our study focused on age wise distribution of population, disease prevalence, disease frequency, treatment pattern of waterborne diseases, number of respondent who complete the course of medicine, educational qualification, season wise distribution of water-borne diseases, frequency distribution of kind of habit of cleanliness while preparing and eating food and finally found the results that are shown below.

Age wise distribution of population

Among the 100 respondents of our survey about 56% were within 18-40 years old. So it is clear that majority of the population in the slum are adults. Around 23% of the respondent age is within 40-60 years. The number of the respondent whose age is within 0-18 years and 60+ are almost same (10% and 11%) are shown in figure 1.

Disease prevalence

From figure 2 the highest number of the respondents (91) suffered from diarrheal diseases, then jaundice (31) along with other waterborne diseases. Virus is one of the main cause of diarrhoea in this subcontinent. [11] So the above percentage claimed that presence of virus in the drinking water is also high. 24% respondents suffered from dysentery. 23 respondents suffered from typhoid fever. Typhoid fever is an infectious illness associated with fever that is most often caused by the Salmonella typhi bacteria. It can also be caused by Salmonella paratyphi, a related bacterium that usually leads to a less severe illness. [12] Typhoid fever is contracted by drinking or eating the bacteria in contaminated food or water. People with acute illness can contaminate the surrounding water supply through stool, which contains a high concentration of the bacteria. [13] The respondents drink water and make or cook food by using water from the same source. So again the supplied contaminated water is the main culprit for causing this disease.

The number for Cholera and Constipation here are same. Cholera is an acute diarrhoeal infection caused mainly by ingestion of food or water contaminated with the bacterium Vibrio cholera. [14] Water is usually the most common source of Vibrio cholera. Here 15 respondents of the study suffered from Amebiasis. Amebiasis is a parasitic infection of the intestines caused by the protozoan Entamoeba histolytica, or E. histolytica. [15] As people who live in institutions with poor sanitary conditions and take unhygienic water are frequently affected by this disease, so we can say that the slum people is also suffered from this disease due to that reasons. Around 27 respondents of the people suffered from other waterborne diseases.

Disease frequency

Here the figure 3 clearly indicates that around 37% percent people suffered from different type of waterborne diseases within one month whereas 19% people suffered from waterborne diseases within 2-3 months. The percentage is 27% in case of 4-6 months. When the time length is 6 months or more the percentage of the disease frequency goes to 17%.So from the above results it is clear that the highest rate of disease frequency is within one month and the second highest rate of disease frequency is within 4-6 months.

Treatment pattern of waterborne diseases

Figure 4 shows that for the treatment of waterborne diseases an average of 52% of people visited and took medicine from retail pharmacy. This retail seller sell most of the medicine, even the controlled drugs without any prescription. So these slum people have easy access to the medicine which is dangerous and causing inappropriate treatment, antibiotic resistance, toxic effect due to wrong medicine, overdose and so on. The solution of all of these problems is to increase public awareness among the slum people and dispensing of prescribed medicine without prescription from the retail pharmacy must be restricted. An average of

18% of people visited and took medicine from quack doctor. As they have easy access to quack doctor rather than registered doctor as well as cheaper too. This quack doctor is not fully educated and does not have enough training and experience about the medical science. For these reason most of the time this slum people usually get inappropriate treatment. The solution of these problems is to increase public awareness among the slum people and proper education and training of the quack doctor. An average of 17% of people visited and took medicine from registered doctor. We found that those people who are educated (Higher Secondary School /College) and for the treatment of children they usually go to the registered doctor. They know that registered doctor's treatment is far better than others. But they cannot go to the registered doctor due to lack of money and don't have easy access to registered doctor. An average of 8% of people visited and took treatment from ayurvedic medicine and an average of 5% of people visited and took medicine from homeopathic doctor. These people take treatment from them because they have extra belief and loyalty to them.

Number of respondent who complete the course of medicine:

From the 100 respondent, only 27 people said that they complete the full course of medicine prescribed by the doctor or given by others. Whereas 73 people don't complete the course of medicine. Here most of them said that after starting to take the medicine when they feel good, there is no sign of the disease they stop to take the medicine. If they take further medicine it's a waste of money they think. Besides poverty, lack of money and knowledge are the reasons of incomplete course of medicine. As a result there might be a possibility of devastating antibiotic resistance. We also found that they have a tendency to take double amount of dose at a time if they miss the previous dose. So drug with narrow therapeutic window may cause serious adverse drug reaction and toxic effect for this reason.

Educational qualification

Figure 5 indicates that around 17% percent people are illiterate from this 100 respondents. So it clearly defines that around one-fifth of the slum population are totally illiterate. The highest percentage (55%) among this 100 respondents belongs to primary level education. So it indicates that more than half of the respondents have completed their primary level education. As primary level education is mandatory for the people of the Bangladesh, that's why this percentage is higher. We found that 21% percent people are secondary level of education among this 100 respondents. So it indicates that one-fifth of the slum population are in this range of education. The percentage (6%) of higher level of education among this 100 respondents is very low. Due to poverty they don't have enough money and facilities to complete this level of education. Only 2% people go to college or university. Because it is much more expensive for a slum people to bear the educational cost. From this above result, it is clear that the percent is decreasing rapidly from primary education to higher studies. One main cause is poverty as well as most of the parents have an expectation that their children will earn money after completing their primary level of education. Due to lack of proper education, the slum people don't have enough knowledge and consciousness about safe drinking water, hygiene and waterborne disease.

Season wise distribution of water- borne diseases

Figure six shows that highest percentage (53.5%) of waterborne disease occurs during rainy season in the slum. Because the main source of drinking water is supply water. During rainy season there is chances of contamination to this supply water due to leakage of the pipe line and transfer of microorganism from unhygienic latrine via rain water. During summer 2nd highest percentage (26%) of waterborne disease occurs in the slum. Summer season also creates favorable condition for microorganisms that are responsible for waterborne diseases. Besides during summer excessive water excreted from the body but in proportion to that this slum people are not able to take sufficient fluid, pure water rather they take contaminated water. In winter the percentages of waterborne disease occurs is low(17.25%).Actually in autumn and spring the weather remains dry which creates unfavorable condition for microorganism.

Frequency distribution of kind of habit of cleanliness while preparing and eating food

From the table no. 1 we got an idea that how often people observed cleanliness while preparing and eating food. Here 97% of the people interviewed said that they washed hands before preparing food, but this answers may be a little biased. All the respondents washed hands after visiting toilet to avoid microbial contamination. 100% of the respondents claimed that they washed their hands before eating meals. On the question of source of obtaining food or vegetables we found that 69% of the respondents bought it from market, whereas 31% from hawker. No respondent bought food or vegetables from nearby grown because the area is very densely populated and there is no free space to grow the vegetables.

Conclusion

From the above result we found that lack of proper knowledge about hygiene, polluted water supply, lack of water supply lack of proper water management practices, unhygienic sanitation, extreme level of poverty, lack of easy access to registered doctor whereas easy access to retail pharmacy, dispensing medicine without the prescription are the main causes of prevalence as well as sufferings by waterborne diseases in this Farmgate slum. However, Government, Non-Governmental Organizations and other social organization should come forward to take necessary steps and effective measures to offer the best facilities for taking more programs in slum areas on pure water supply, sanitation and proper education. Moreover, specific rules and regulations need to be established to enforce the owners of household or related people to provide the pure adequate water, sanitary facilities in the slum.

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Table 1. Frequency Distribution of Kind of Habit of Cleanliness While Preparing and Eating Food

Parameter	Trend	Number of Respondent	Percentage
Washing hands before preparing food	Yes	97	97%
	No	3	3%
Washing hand after visiting toilet	Yes	100	100%
	No	0	0%
Washing hand before eating meals	Yes	100	100%
	No	0	0%
Keeping food covered	Yes	72	72%
	No	28	28%
Washing raw food before eating	Yes	57	57%
	No	43	43%
Source of obtaining food/ vegetables	Market,	69	69%
	Hawker,	31	31%
	Nearby grown	0	0%

Figure 1. Age Wise Distribution of Population

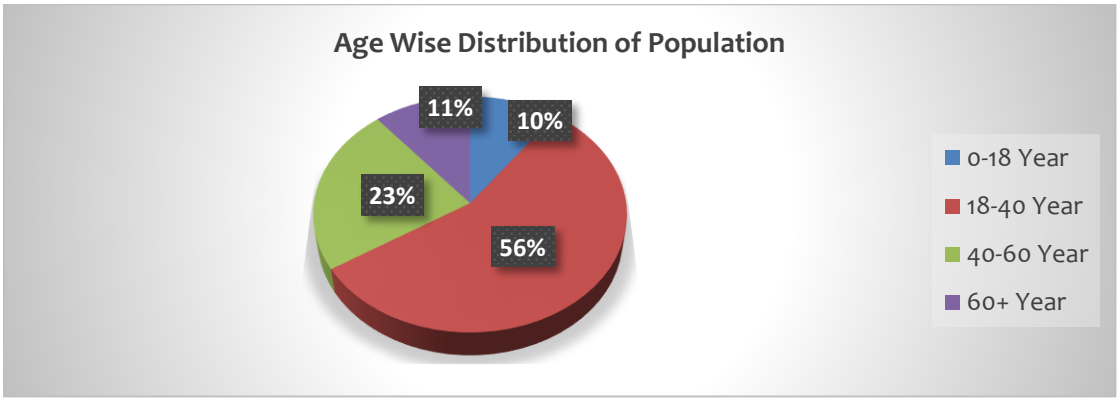

Figure 2. Disease Prevalence

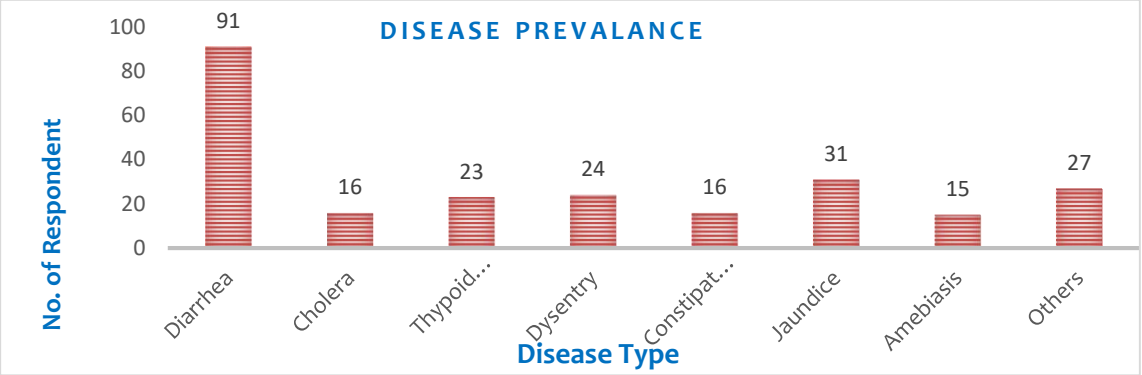

Figure 3. Disease Frequency

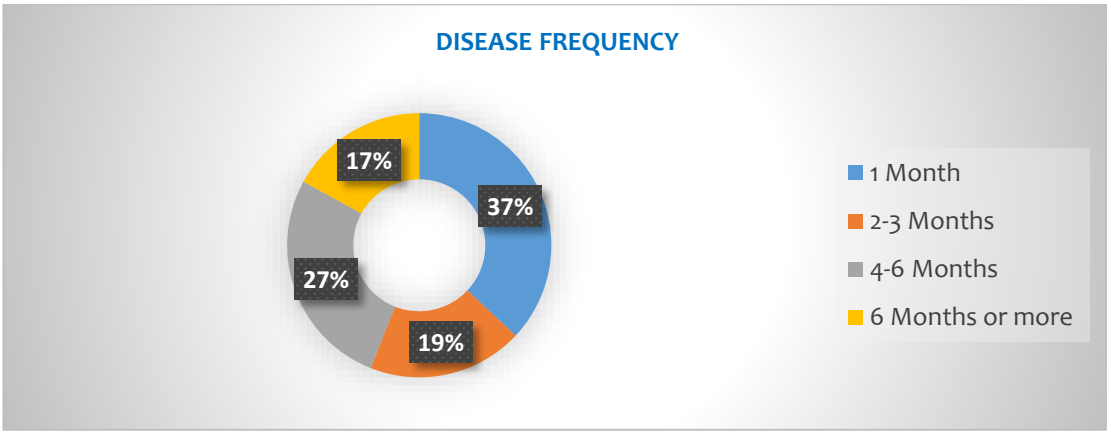

Figure 4. Treatment Pattern of Waterborne Diseases

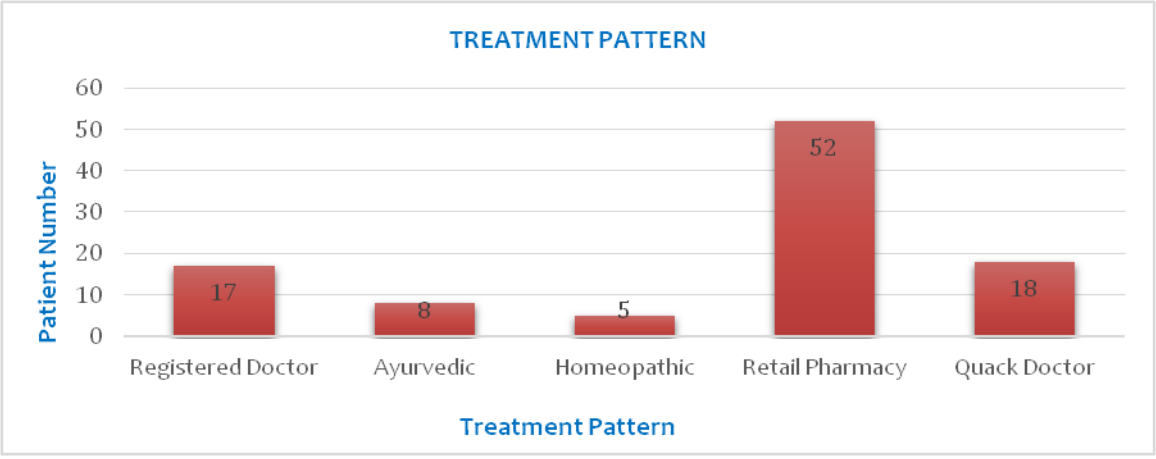

Figure 5. Educational Qualification

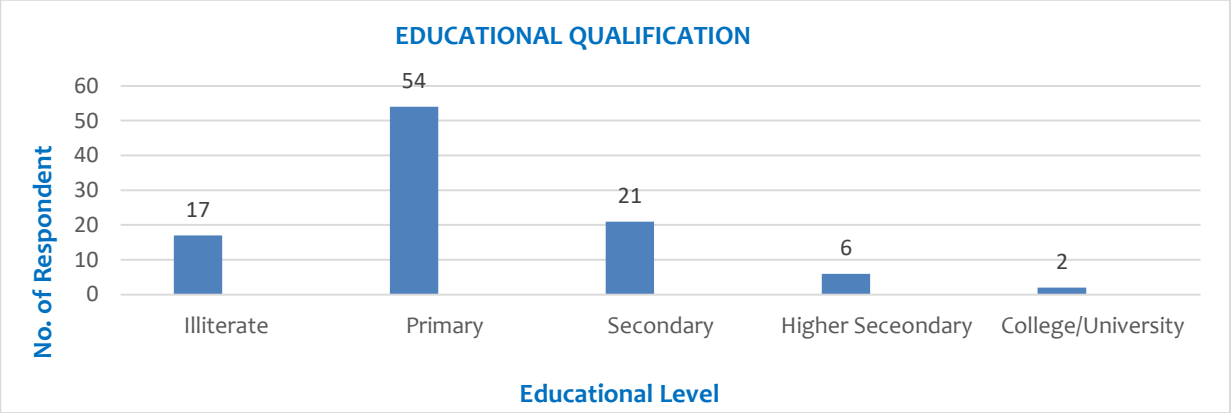

Figure 6. Season wise distribution of Water- Borne Diseases