

An Assessment On the Factors Contributing to The Recurrence of Cholera Out Break in Maiduguri Metropolitan Council (Case Study of Gwange Ward, Maiduguri, Borno State)

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Abstract

The study was carried out to assess the factors contributing to the recurrence of cholera outbreak in Gwange ward. A descriptive cross sectional study design was used. The respondents were selected using questionnaires. A study size of Seventy (70) households was used. However, only sixty (60) questionnaires were retrieved. The study population consisted of the heads of households aged 15 years and above. Both the males and females who have lived in Gwange ward for the past 7 years and above were available at the time of data collection. Primary data was collected using self administered questionnaires. Data was analyzed using a scientific calculator. The findings were presented in frequency distribution tables and cross tabulation were used to determine the relationship between variables. The study showed that some people had moderate knowledge on the causes of cholera and its prevention as they were able to identify factors such as the poor sanitation contributed to the recurrence of cholera. It also revealed that some dispose their refuse in the open, despite the continued health education on cholera and its prevention. The study also showed that high level of unemployment of 87% contributed to their inability to maintain a high standard of environmental and personal hygiene thereby posing a great risk of diarrheal disease outbreaks such as cholera. On the basis of these findings, it can thus be concluded that the contributing factors to the recurrence of cholera outbreak in Gwange ward was due to high level of poverty, poor personal hygiene and environmental sanitation.

Keywords: Cholera; Gwange, Questionnaire

Introduction

Cholera is a disease that continues to ravage developing countries including Nigeria, and Borno in particular, and remains a serious public health problem in low-income countries despite efforts in the past to promote oral rehydration therapy as major treatment. Epidemics of cholera are characteristically abrupt and after have a high potential to spread fast and cause deaths, because it induces acute severe diarrhea and can result in death if oral rehydration is not administered quickly. The epidemic reaches a peak and subsides gradually as the "force of infection" declines. Often times, by the time control measures are instituted the epidemic has already reached its peak and is waning.

It affects all ages and both sexes. In endemic areas, attack rate is highest in children. The *Vibrio* is destroyed in an acidity of pH 5.0 or lower. Conditions that reduce gastric acidity may influence individual susceptibility [1].

The incidence of cholera tends to be the highest in the lower socio-economic groups, and this is attributable mainly to poor hygiene. *Vibrio* transmission is readily possible in the environmental sanitation. The environmental factors of importance [2] include contaminated water and food. Flies may carry *Vibrio cholera* which later contaminates the food. Numerous social factors comprising of certain human habits favouring water and soil pollution. Low standards of personal hygiene, lack of education and poor quality of life also contribute to cholera [3].

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Transmission can also occur from man to man via fecally contaminated water, uncontrolled water sources such as wells, lakes, ponds streams and rivers pose a great threat, ingestion of contaminated food and drinks have been associated with outbreaks of cholera. Bottle feeding could be a significant risk factor for infants. Fruits and vegetables washed with contaminated water can lead to cholera outbreak. To improve cholera control efforts in addition to maintaining and improving existing water supply, sanitation and hygiene behavior measures must be considered [4].

In Maiduguri, there were 4,536 cases of cholera, including 70 deaths as of 30, October 2014. The highest number of cases was reported during week 41 (5 - 11th October), when around 1,500 were reported. Around 260 cases were reported during week 39 (20 - 27th September) when the outbreak started. The number of cases reported per week has been decreasing since week 41, but there are an increasing number of severe cases. (Assessment Capacities Project Start, 2014).

Cholera still remains a public concern as many lives are lost during an outbreak every year. It was discovered that people around the study area had the knowledge on cholera but could not practice on what they knew because some still believe that cholera was "air borne disease" which people have no control over and can occur anytime. The situation in most of the communities in Gwange town in frightening especially when one looks at the state of drainage and sewer systems as well as the failure of local authorities to dispose waste. Many places have clogged drainage systems, and the slightest of rains leaves many places flooded. Due to the heavy rains, poor drainage systems in Gwange ward, sanitation has greatly deteriorated in the city leading to increase in cholera cases. With this scenario, despite having many health institutions in the state, it is not a surprise that cholera breaks out almost every rain season and year in, year out, leading to lose of lives, and it appears no lessons are learnt. Hence the need for this research.

Material and Methods

Research Design

Research design is the plan; structure and strategy of investigations of answering the research questions or blue print the researcher selects to carry out their study². The research design includes the description of the subjects, observations or variables, measures of time and selection of the setting [4].

In this study, the design used was descriptive design. A descriptive research which specified the nature of a given phenomenon [5]. This is done to find out the factors contributing to the recurrence of cholera outbreak in Gwange ward of MMC, Borno state.

Research Setting

The study was conducted in Gwange ward of MMC, Borno state. It is one of the largest ward with a population of about 190, 000 and large number of cholera cases are reported yearly, especially during the rainy season. It is accessible mainly by road. Gwange ward is divided into three (3) zones; Gwange I, II and III respectively. It is located opposite Gidan Dambe.

Majority of its inhabitants are low – income earners mainly comprising of traders and farmers. The location is characterized by poor drainage and the source of water supply and sanitation is still a problem. Some members of the community still use shallow boreholes as source of water. The drainage system is poor, leading to flooding during the rainy season.

The socio – economic status of most of the people in the area are below average most of those who are self employed are involved in vending, some of the people in the area do not even have any means of livelihood. Most of the people in the community are not formally employed. Men are involved in petty trading like charcoal selling, shoe, bicycle, television (TV) and radio repairs, while women are involved in selling vegetables and other food stuff both in the market and at home.

Study Population

The study population is the total population from which the study unit was drawn from [2]. The study population consists of the head of households aged 18 years and above, both males and females who live in Gwange ward of MMC, Borno state.

Target Population

The research was carried out in Gwange ward of MMC where seventy elements (70) elements were selected randomly for the research work at the study area.

Instrument for Data Collection

The instrument used for the collection of data is a structured questionnaire to obtain first hand information on the research questions. The questionnaire comprises of two sections. Section I contain personal data of the respondent, while section II contains the questions based on the research topics.

Validation of the Instruments Used

A copy of the constructed questionnaire was presented to the project supervisor for correction. The correction and the adjustment were effected accordingly.

Method of Data Collection

The questionnaires were administered to 70 individuals of Gwange community to fill and return to the research, while an interview method was also used on those respondents who could not read and write and the questions were filled by the researcher when the respondent answers the questions [6].

Method of Data Analysis

The data collected were analysis using descriptor statistical tools, it's using simple frequency table for easy understanding. The researcher used frequency distribution in calculating the percentage of respondents' data was analyzed and figures obtained were summarized on a frequency table.

Results

Data Analysis and Presentation of Findings

This chapter present results of findings. It also highlights on how data were analyzed and interpreted. Date was collected from respondents using questionnaires: seventy (70) questionnaires were randomly distributed as follows, thirty (30) to Gwange I, and twenty (20) each to Gwange II and III respectively. Out of the seventy questionnaires distributed, sixty were retrieved while Ten (10) were not retrieved.

Data Processing and Analysis

Data analysis is the systematic organization and synthesis of research data and testing of research hypothesis using those data [7]. In this research, questionnaires were collected and analyzed. Anomalies identified and corrected after which data were checked for completeness, coding and thereafter, it was presented on the data sheet and were analyzed processed manually using tables.

Data Presentation

Various data components were recorded on the data presentation sheet which was divided into four (4) these sections include the: demographic data, social, cultural and environmental factors and the last section was based on the knowledge related factors on cholera and its prevention.

Data were further presented on frequency table and pie charts which were expressed in percentage and cross tabulations. The use of frequency table and pie chart in data presentation [8] are suitable because they summarize the findings in a meaningful way to enable the reader to understand the findings of the research study. While it is important to note that, cross tabulation is necessary and helpful in showing the relationships between variable from which meaningful inferences was drawn. The findings of this study were presented according to the sequence of questions and sections in the questionnaires.

Demographic Data

This section consists of factors which were categorized according to gender, age marital status, current employment status, number of people living in the household and shown in the table 1 below; The table shows that more than half (65%) of the respondent were women while 35% or the respondents were men. The respondents ages ranged from 15 - 36 years' ad above less than half (20%) of the respondent were in the ages category of 36 and above years. In this study, more than half (55%) of the respondent were unemployed and more than a quarter (30%) were self employed more than half (55%) or the respondents had 7 and above people living in the house, while 17 (28%) or the respondent had 4 - 6 people.

Variable	Frequency	Percentage (%)
Gender	21	35
Female	39	65
Total	60	100
Age		
15 - 17	13	22
18 - 30	18	30
31 - 35	17	28
36 and above	12	20
Total	60	100
Marital status		
Married	35	58
Single	22	37
Widowed	1	2
Divorced	2	3
Total	60	100
Educational status		
Primary	7	12
Secondary	29	48
Tertiary	22	37
None	2	3
Total	60	100
Current employment status		
Unemployed	33	55
Self employed	18	30
Formal employed	9	15
Total	60	100
No of people in your household		
1 - 3	10	17
4 - 6	17	28
7 and above	33	55
Total	60	100

Table 1: Demographic Data.

The study component investigated the knowledge of respondents on cholera and preventive measure as shown.

Causes of cholera	Frequency	Percentage (%)
Germs	42	70
Bad air	11	18
Don't know	07	12
Total	60	100
Signs and symptoms of cholera		
Coughs blood	05	8
Loses weight	09	15
Having severe diarrhea & vomiting	46	77
Total	60	100
Self-treatment of cholera		
Give traditional medicine	0	0
Give ORS	38	63
Take to the clinic	22	37
Total	60	100
Prevention of cholera		
Clean house, and toilet	27	45
Boil drinking water	10	17
Cover and cat hot food	08	13
Wash hand after toilet	15	25
Total	60	100
Storage of leftover food		
Cover it and re-heat before eating	49	81
Cover it and eaten cold in the next meal	07	12
Not covered and eaten cold	0	0
Put in the fridge and before eating	04	7
Total	60	100
Times of washing hands		
Before serving food	25	43
After serving food	0	0
Before eating food	35	58
Total	60	100

Table 2: Knowledge Related Factors.

More than half (70%) of the respondent responded that cholera was caused by a germ that caused cholera, while (18%) of the respondents thought that cholera was caused by bad air [9]. Slightly more than half (63%) of the respondents know that giving ORS helps manage diarrhea before taking to the hospital while only (37%) believed that cholera patient should be taking to the clinic for treatment, while none (0%) believed that cholera can be cured by administering traditional medicine. More than two third (45%) of the respondent believed that cholera can be prevented through cleaning the house and toilet, while only (25%) believed that it can be prevented by washing hands after

toilet. More than half (81%) of the respondents had knowledge that covering and re-heating the before eating prevents cholera outbreak while less than a quarter (12%) of the respondent covered the food but ate it cold. More than half (58%) of the respondents knew that washing hands before serving food prevents cholera while only (42%) of the respondents know that washing hands before serving food prevented cholera and none believed used that washing hands after serving food can prevent cholera.

Table 3 presents the recurrences of cholera. The result shows that more than half (59%) of the respondent stayed in Gwange ward for 7 years and above, (33%) stayed for 4-7 years, while only (60%) stayed for 1-3 years. Almost three quarters (78%) of the respondents experienced the recurrence of cholera outbreak while (35%) experienced the cholera outbreak only once. More than half (54%) of the respondents responded that recurrence of cholera is caused by poor toilet facilities while (25%) of the respondents responded that recurrence also is by drinking dirty water. The result also showed that (45%) of the respondents suffered from cholera of which (65%) of the respondents were due to another member of the household had cholera, while (20%) of the respondents consumed untreated water.

Recurrence of cholera	Frequency	Percentage (%)
Duration of stay		
1-3 years	05	8
4-7 years	20	33
More than 7 years	35	59
Total	60	100
Whether or not experienced cholera		
Yes	47	78
No	13	22
Total	60	100
Number of cholera experienced		
Once	21	35
More than once	39	65
Total	60	100
What are the Causes of cholera in Gwange?		
Poverty	08	13
Overcrowding	5	8
Drinking dirty water	15	25
Poor toilet facility	32	54
Total	60	100
Have you suffered from cholera infection?		
Yes	27	45
No	33	55
Total	60	100

If yes, what lead having cholera		
Dunked untreated water	12	20
Attended a funeral of a suspected patient	0	0
Ate unwashed fruits from the marked	09	15
Another member at home had cholera	39	65
Total	60	100

Table 3: Recurrence of Cholera.

Cross Tabulation

Cross tabulation or contingency table allows visual comparison of summary data output related to two variables within the sample. The table is a useful preliminary strategy for examining large amounts of data (burns and groove 2005).

Table.4 shows that 69% of the respondents in the age group 15-17 experienced recurrence of cholera outbreak while 75% those in the age group above 36 years did not experience the outbreak.

Recurrence/age group	15-17	18-30	31-35	36 and above	Total
Recurrence	9 (69%)	5	4	3 (25%)	21
No recurrence	4	13	13	9 (75%)	39
Total	13	18	17	12	60

Table 4: Relationships between Recurrence of Cholera and Age.

Table 5 presents than 56% of the female respondent’s experience recurrence of cholera outbreak and 10% of the male respondents never experienced the recurrence of cholera outbreak.

	Female	Male	Total
Recurrence	22 (56%)	19 (90%)	41
No recurrence	17	2 (10%)	19
Total	39	21	60

Table 5: Relationships between Recurrence of Cholera and Gender.

Table 6 presents the relationship between for recurrence of cholera and number of occupancy. The result shows that majority (88%) and (91%) of the respondents living in the household more than three (3) and above experienced the recurrence of cholera with only 30% of the respondents with 1-3 occupants did not experience the outbreak.

Number of Occupant				
	1 - 3	4 - 6	7 and above	Total
Recurrence	7	15 (88%)	30 (90.1%)	52
No recurrence	3 (30%)	2	3	8
Total	10	17	33	60

Table 6: Relationship between Recurrences of Cholera Number Occupant.

Table 7 presents the relationship between recurrence of cholera and occupation. The result showed that more than three quarters (88%) of the unemployed respondents experienced the recurrence of cholera while 22.0% of the respondents in the formal employment did not experience the cholera outbreak.

Recurrence	Unemployed	Self employed	Formal employed	Total
Recurrence	29 (87%)	10	7 (78%)	46
No recurrence	4	8	2 (22%)	14
Total	33	18	9	80

Table 7: Relationship between Recurrence of Cholera and Occupation.

Table 8 relationships between recurrence of cholera and refuse disposal. The result indicated that more than half of the respondents (88% and 75%) who used dust bin and open space experienced recurrence of cholera, while 47% of the respondent using rubbish pit for the rubbish disposal did not experience any recurrence of cholera outbreak.

REFUSE DISPOSAL				
	Rubbish Pit	Dustin/Sack	Open Space	Total
Recurrence	10	29 (88%)	6 (75%)	45
No Recurrence	9 (47%)	4 (12%)	2 (25%)	15
Total	19	33	8	60

Table 8: Relationships between Refuse Disposal and Recurrence of Cholera.

Conclusion

The discussion of finding is based on data collected from a sample of sixty (60) respondents in Gwange ward. Heaps of refuse around everywhere in Gwange leading to collection of garbage. There is also poor drainage system. Overcrowding is seen as a common feature in most of these households having more than 6 occupants. This can facilitate quick spread of cholera during an outbreak due afore mentioned reasons. In this study, the demographic characteristics of the respondents comprises of age gender, marital status, educational status employment status and number of occupants in the household. This was relevant to this study because it gave a background about the community the researcher was dealing with. The age category ranged from 15-36 an above and the majority of the respondent 18 (30%) were in the age group of 18-30 years. In this study, nearly three (3) quarters (65%) of the respondents were not married while 35% of the respondents were not married. This suggests that most of the respondents are within the child bearing age and hence the increased population resulting in overcrowding. The number of occupants in the household revealed that more than half (55%) had 7 and above people living in a single house hold while 17% of the respondent had 1-3 people living in the same household, this pauses a great risk of quick spread of cholera during the outbreak due to overcrowding which results from poor environmental sanitation.

From the demographically data it was revealed that slightly close to three (3) quarter (65%) of the respondents were females and slightly above a quarter (35%) were males. These findings in this study could be attributed to the fact that man are usually out for work and businesses, this means more female were available than males to answers the questionnaires as they are mostly at home taking care of their families, while others engage in petty trading by the roadside at home.

Discussion

Recurrence of Cholera

Recurrence is defined as the repeatedly occurring (oxford English mini dictionary, 2008). In this study, recurrence means that repeatedly occurring of cholera outbreak in Gwange Ward. The result of the study showed that 67% of the respondents experienced recurrence

of cholera outbreak while 33% of the respondents did not experience the outbreak as shown in figure 1. This could be attributed to the poor sanitation, a lack of hygiene and access to safe and clean water. The absence of solid waste disposal system and the unhygienic street trading of fruits, vegetables and other foodstuffs across Gwange Ward have been identified as the main reasons for the spread of this highly contagious disease. These results are consistent with the findings by WHO (2010) which showed that cholera cases continue to occur every year.

As shown in table 4.7, the majority of the respondents are unemployed and 78% of the self employed respondents experienced the recurrence of cholera outbreak. This could be due to the fact that the poor economic status of the community members makes it difficult for them to maintain a good standard of environmental hygiene and good sanitation in order to prevent the outbreak.

The study revealed that 88% and 90% of the respondents had more than four (4) occupants and they experienced recurrence of cholera as shown in table 4.6. This could be due to the fact that overcrowding helps in facilitating the fast spread of cholera.

As shown in table 4.8, the majority of the respondents 88% and 75% who used dustbin and open space experienced recurrence of cholera while 47% of the respondents who uses rubbish pit for the refuse disposal experienced no recurrence. This is because proper refuse disposal is cardinal in the prevention of cholera outbreak especially during the rainy season due to floods which later cause water source contamination. This finding is also in accord with the finding by AllAfrica (2010), who reported that most common reason for recurrence of cholera is poor sanitation a lack of hygiene and access to portable water.

Environmental Factor

Refuse Disposal

The study revealed that more than half (75%) of the respondents used open space to dispose their refuse experience cholera, while 47% of the respondents used refuse pit for their refuse disposal I did not experience cholera outbreak as shown in table 4. In addition, most of the refuse pit seen during data collection were full with flies and were not covered; this facilitated the transmission of the *Vibrio cholera* from rubbish pit on to the food by flies. The high levels of poor environmental sanitation were as a result of indiscriminate disposal which led to the accumulation garbage around. From the description above, this could be the reason why there is recurrence of cholera outbreak in Gwange Ward due to the improper refuse disposal because during the rainy season, the refuse is washed away into the compound and contaminate source of water supply leading to cholera outbreak.

Knowledge Related Factors

Knowledge on Recurrence of Cholera Outbreak

Knowledge is the awareness gained through experience of education (Oxford English Mini Dictionary, 2008). In order to prevent cholera recurrence, the individuals need to know about what causes cholera outbreak, the presenting signs and symptoms of cholera, management and the prevention of cholera.

This study revealed that 70% of the respondents had adequate knowledge on the causes of cholera and its prevention, while only 30% of the respondents had moderate knowledge on the causes and prevention of cholera as shown in table 4 the high knowledge by the respondents could be due to the experiences they had on cholera outbreak. This knowledge could also be attributed to the continuous health talks on cholera and its prevention given through the media, during outbreak programmes in the community health workers and the members of staff especially the environmental health technicians (EHTs) who help the community to acquire knowledge on cholera prevention.

This study was carried out to assess the contributing, factors to the recurrence of cholera outbreak in Gwange ward. The research findings have shown that even though the respondents had high knowledge regarding prevention of cholera other factors influenced the recurrence of cholera outbreak in Gwange ward. These factors such as the usage of unsafe drinking water and poor hand washing prac-

tices contributed to the recurrence of cholera. The high levels of unemployment of the resident worsened the situation because it made it more difficult for the community members to improve their standard of hygiene.

Recommendations

1. In view of this study, it identified the gaps in areas such as social, cultural and environmental factors, knowledge and practice. The following recommendations are made:
2. The district health management team (DHMT) should collaborate with other cooperating partners to carryout community sensitization on cholera prevention and control.
3. Since practice was a problem identified as reviewed by this study, another research should be conducted to determine factors leading to poor health practices by the community members in order to prevent recurrence of cholera outbreak.
4. State government should work with the local government hand-in-hand and enact a strict law governing weekly or monthly sanitation to reduce the accumulation of wastes thereby reducing the source of cholera outbreak.
5. The community health workers should work hand in hand with the NGOs to continue community sensitization on cholera and its prevention to create awareness on the factors contributing to the recurrence of cholera in Gwange ward. They should emphasize practicing because knowledge alone cannot prevent cholera
6. The environmental health technicians (EHTs) should intensify the inspection of the water source, public toilets in bars and market places for environmental sanitation in order to identify early, the suspected water sources of infection and prevent the possible outbreak.
7. All health workers should use every opportunity as they encounter with the client to educate them on cholera and its prevention.
8. Federal government should assist the local government through provision of drugs and relieve materials for the victims of cholera outbreak.

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