

## RESEARCH ARTICLE

### KNOWLEDGE ABOUT CHOLERA AND ITS PREVENTION AMONG PEOPLE ATTENDING SOME OF THE PRIMARY HEALTH CARE CENTERS IN BAGHDAD

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#### ABSTRACT

**Background:** Cholera is one of the most serious epidemic diseases. It's an endemic disease in Iraq; and occurs with irregular outbreaks. It's an easily treatable disease if diagnosed early, however if left untreated, it can kill quickly.

**Aim:** Assess the knowledge of cholera and its prevention among people attending primary health care centers in Baghdad.

**Subjects and methods:** A cross sectional study on a convenient sample using a direct interviewing questionnaire carried out in 12 Primary Health Care centers in Baghdad during the period 15<sup>th</sup> March-15<sup>th</sup> April 2016. Adults above the age of 18 were included.

**Results:** A sample of 300 interviewed. Males were 94 (31.3%), the females were 206 (68.7%). Overall knowledge was 60%. Good knowledge was seen in regard to general characteristics of cholera (75.7%) where (86.7%) knew that dirty water and food is the most important risk factor for transmission of cholera, (86.3%) said that watery rice stool is the main presenting symptom, while poor knowledge scores were found in knowledge related to complications (37.8%), dis-infection (42.2%) and treatment (54.4%). Only (36.0%) knew the causative agent of cholera.

The findings showed a significant association ( $p$  value  $<0.05$ ) between respondents' knowledge and gender, females (72.3%) have better knowledge than the males (48.9%), and knowledge with occupation, employers have good knowledge (70.3%).

Television has the highest scores as a source of the information (42%) followed by primary health centers (36%).

**Conclusion:** The overall knowledge about cholera was above average. The mass media, mainly television have a greater impact on general people's knowledge and that women are more knowledgeable than men.

**Key words:** Cholera, Prevention, Knowledge, Baghdad.

#### INTRODUCTION

Cholera is a waterborne, serious infection affects the small intestine and caused by the toxigenic strains of *Vibrio cholera* which remains a life threatening health problem, due to its contribution to morbidity and mortality in developing countries (World Health Organization, 2011). The world health organization estimates the reported cases which represent only 5–10% of the real number occurring yearly throughout the world and find that 3 to 5 million cases occur every year, and about 100, 000 to 120, 000 die (Ali *et al.*, 2012). Most cholera infections are not detected yet large outbreaks can still occur (Chao *et al.*, 2011). It is characterized by acute watery diarrhea, muscle spasm, vomiting and severe dehydration (Kaper *et al.*, 1995). *Vibrio cholera* is found in an aquatic environment (Reidl *et al.*, 2002; Sack *et al.*, 2004) and More than 200 different serogroups were isolated from environmental Sources (Shimada *et al.*, 2014). The most common strains that cause the clinical illness of cholera are serogroup O1 and O139 (Sack *et al.*, 2004; Morris *et al.*, 1990). Still, the actual numbers are much higher due to underreporting, conflicting definitions of acute watery diarrhea from country to country, and poor surveillance systems (World Health Organization, 2011). The last cholera outbreak has occurred in Iraq in September 2015, and in 22 November

a total number of 2810 laboratory-confirmed cases of *Vibrio cholera* were established at the Central Public Health Laboratory in Baghdad, and only 2 deaths due to cholera were reported (WHO, 2016). So this study was conducted to focus on peoples' knowledge about cholera and its prevention in Baghdad.

#### MATERIALS AND METHODS

A cross sectional study, data collection was conducted during 15/3/2016-15/4/2016. The study area included 12 PHC centers in Baghdad. These centers were chosen conveniently. The sample size was 300 people chosen by a convenient sampling technique.

##### Inclusion criteria

1. All adult age 18 years and above.
2. Both males and females were included
3. Everyone agreed to participate in the study.

##### The exclusion criteria

1. Children.
2. Those who refused to participate.

**Data collection:** The data was collected by interviewing people who attend PHC centers, by a questionnaire made by

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the researcher and supervisor. A pilot survey of 10 respondents was conducted in order to refine the research questionnaire format and sequence. The questionnaire included two parts.

**The first part:** included the socio-demographic data.

**The second part:** a set of 13 questions testing people's knowledge

The participants responded to these questions (ten of them) in the form of choosing the most appropriate one answer or multiple answers according to the question, the other remaining (three) were in the form of yes or no.

### Ethical consideration

Approval consent was obtained from the Arabic Board committee of family medicine, AL-Karkh Health Directorate and AL-Resafa Health Directorate in Baghdad. Verbal consent from all the participants was taken.

### Limitation of the study

1. No random sampling.
2. Limited to specific population (visitors to PHC centers).
3. Limited to specific PHC centers and this is due to security reasons and inability to visit all the PHC centers.

### Statistical analysis

To measure knowledge of the participants on cholera and its prevention, a scoring system was used. Each correct response was scored as 1 while other responses, such as 'incorrect' or 'don't know', were scored as 0 (zero). The data was entered through excel 2010 and then analyzed by using the statistical package for the social sciences (spss) version 20.0 the following analysis plan was used:

- Frequency tables were used.
- Mean percent scores were used to describe knowledge rates.
- A chi-squared test of significance was performed to assess the association between categorical data.

P-value  $\leq$  0.05 was considered significant.

## RESULTS AND DISCUSSION

**Table 1:** Summaries the socio demographic features of all participants. The highest participants were from age group 18-30 [n=96 (32.0%)]. Of all respondents, 94(31.3%) were males and 206(68.7%) were females. Most of the respondents were living in urban areas [n=288(96.0%)] and few were from rural areas [n=12(4.0%)]. The highest participants were college graduates [n=112 (37.3%)], employers were [n=158(52.7%)] and internal displaced people (IDP) [n=16(5.3%)].

**Table 2 and figurer 1:** There are 26 questions in the knowledge about cholera and its prevention the total score ranged from 0 to 26. Poor knowledge was defined as score  $\leq$  12 and good knowledge was defined as score  $\geq$ 13. The overall knowledge was (60%). The majority of the correct responses were on the general characters where the mean percent of responses was (75.7%).

**Table 1. Shows the sociodemographic characteristics of the studied sample**

Variables	Number=300	Percent%
<b>Age group</b>		
18 - 30 years	96	32.0%
31 - 40 years	93	31.0%
41 - 50 years	87	29.0%
>51 years	24	8.0%
<b>Gender</b>		
Male	94	31.3%
Females	206	68.7%
<b>Educational level</b>		
Illiterate	18	6.0%
Read and write	25	8.3%
Primary school	45	15.0%
Secondary school	84	28.0%
College	112	37.3%
Others	16	5.3%
<b>Occupation</b>		
Employer	158	52.7%
House wife	102	34.0%
Student	18	6.0%
Free jobs	14	4.7%
Others	8	2.7%
<b>Residence (Address)</b>		
Urban	288	96.0%
Rural	12	4.0%
<b>Internal displaced people (IDP)</b>		
Yes	16	5.3%
No	284	94.7%

**Table 2. Shows the correct answers of the participants about cholera in the study group n=300**

Knowledge domains (1 score for each correct question)	Correct answers	Percent %
<b>General characters (5 Qs)</b>		75.7%
Cause of Cholera	108	36.0%
Is it communicable?	256	85.3%
Main route of transmission	253	84.3%
Most important risk factor	260	86.7%
Main presenting symptom	259	86.3%
<b>Complications (5 Qs)</b>		37.8%
Dehydration & Shock	234	78.0%
Death within several hours	142	47.3%
Seizure	72	24.0%
Unconsciousness	62	20.7%
No complication	57	19.0%
<b>Prevention (9 Qs)</b>		71.3%
Hand washing	241	80.3%
Wearing gloves	197	65.7%
Disinfect water	254	84.7%
Good sanitation	211	70.3%
Garbage disposal	195	65.0%
Cook food thoroughly	201	67.0%
Avoid raw or uncooked food	201	67.0%
Avoid street food, drinks and salads	218	72.7%
Vaccination	207	69.0%
<b>Dis-infection (3 Qs)</b>		42.2%
Boiling	160	53.3%
Chlorination	202	67.3%
Sunlight exposure	18	6.0%
<b>Treatment (3 Qs)</b>		54.4%
ORS	113	37.7%
I.V. fluids	196	65.3%
Antibiotics	181	60.3%
Do you know that there is a vaccine for cholera? (1 Q)	196	65.3%
<b>Overall Knowledge average</b>		60.0%

While the least correct responses were on the complications of cholera where the mean percent of knowledge was (37.8%). In the part of general characters: the majority of respondents (86.7%) identified water and dirty food as the most important risk factor for transmission of cholera, (86.3%) said rice watery stool is the main presenting symptom of cholera but only (36.0%) knew that bacteria is the causative agent of cholera. In the part of complications:

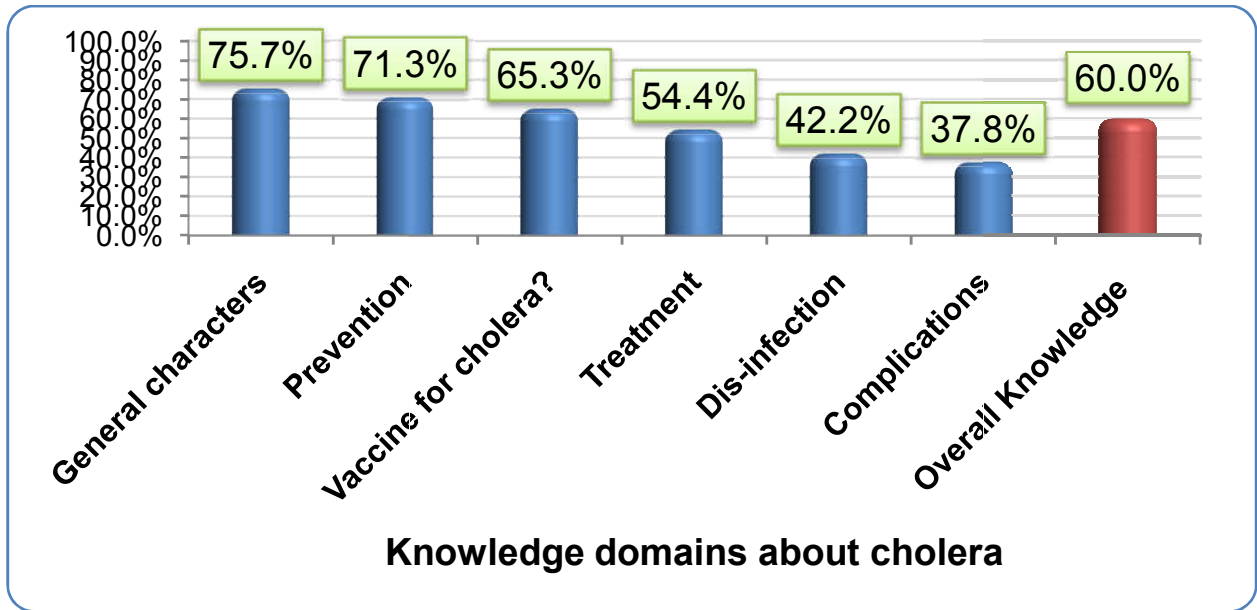


Figure 1. Shows the mean percentage of correct answers in knowledge about cholera

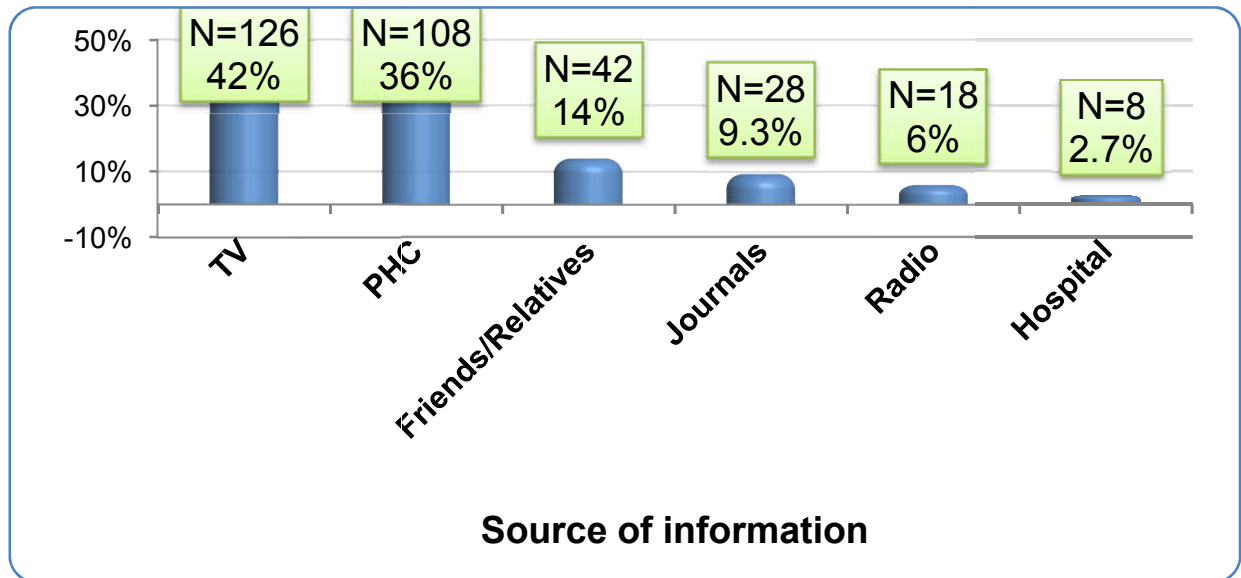
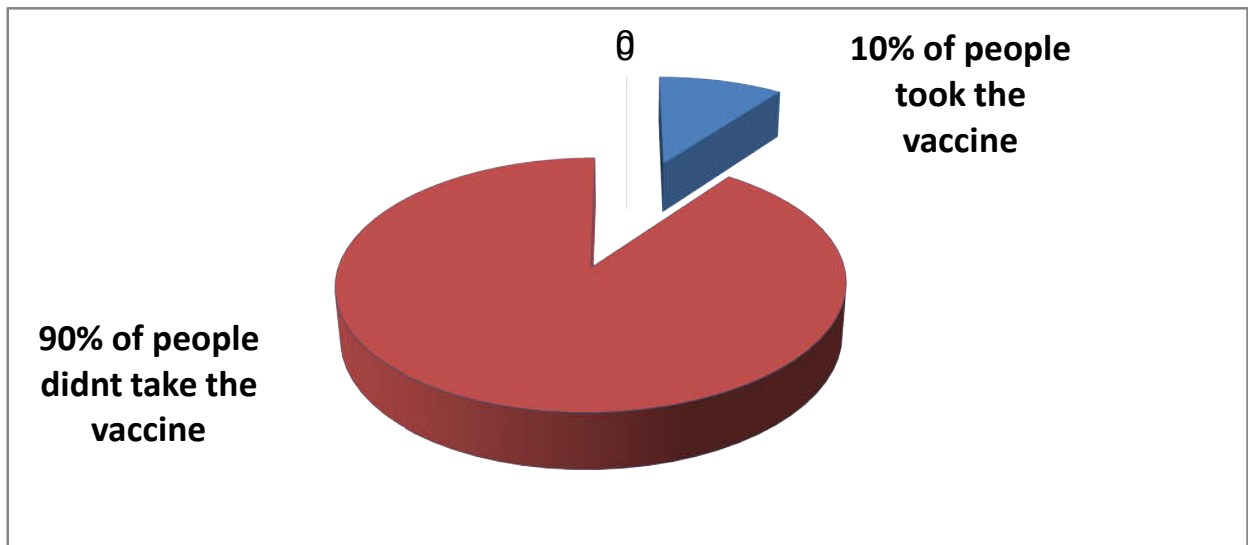


Figure 2. Shows number and percentage of the participants, according to source of their information about cholera



30 people took the vaccine [30/300=10%]; 270 people didn't take the vaccine [270/300=90%]

Figure 3. Shows the percentage of people who took the vaccine in our sample size

The majority of respondents (78.0%) stated that dehydration and shock is one complication of cholera but only (19.0%) said that there is no complication. In the part of prevention: the majority of respondents (84.7%) said that disinfected water is one of the options to prevent cholera. In the part of water disinfection: the majority of the responses (67.3%) were on chlorination of water but only (6.0%) were on sunlight exposure. In the part of treatment: the majority of responses (65.3%) were on IV fluid but (37.7%) was on ORS. Only (65.3%) knew that there is a vaccine for cholera.

**Table 3:** respondents with poor knowledge of cholera were seen in all age groups with no significant difference. On the other hand significant differences were seen mainly in the gender and occupation where p value <0.001. Females (72.3%) have better knowledge about cholera than the males (48.9%) and the difference was significant.

The employers have good knowledge than the others (70.3%) and the difference was significant. In the part of educational level: People with college degree have good knowledge (71.4%) than the others. Poor knowledge was seen in the people who can read and write (52.0%). People who live in urban areas have good knowledge (66.0%) as compared to people who lived in rural areas (41.7%). Internal displaced people have poor knowledge (56.2%) than the non-displaced people (33.8%). Those with a member of the family affected have poor knowledge (60.0%) than those non affected (34.1%). According to the source of information T.V has the highest score in our study where [n=126(42%)] followed by PHC centers (36%), while the lowest score was from the hospital [n=8(2.7%)].

**Table 3. Shows the relation between the sociodemographic characteristics & knowledge level of the participants in the studied sample**

Variables	Poor knowledge		Good knowledge		Test	p-value		
	No.	%	No.	%				
<b>Age group</b>								
18 - 30 years	40	41.7%	56	58.3%	$\chi^2 = 2.936$	0.402		
31 - 40 years	29	31.2%	64	68.8%				
41 - 50 years	29	33.3%	58	66.7%				
>51 years	7	29.2%	17	70.8%				
<b>Gender</b>								
Male	48	51.1%	46	48.9%	$\chi^2 =$	<0.001		
Females	57	27.7%	149	72.3%			15.527	*
<b>Educational level</b>								
Illiterate	8	44.4%	10	55.6%	$\chi^2 = 6.557$	0.256		
Read and write	13	52.0%	12	48.0%				
Primary school	18	40.0%	27	60.0%				
Secondary school	28	33.3%	56	66.7%				
College	32	28.6%	80	71.4%				
Others	6	37.5%	10	62.5%				
<b>Occupation</b>								
Employer	47	29.7%	111	70.3%	Exact =	<0.001		
House wife	31	30.4%	71	69.6%			26.652	*
Student	12	66.7%	6	33.3%				
Free jobs	12	85.7%	2	14.3%				
Others	3	37.5%	5	62.5%				
<b>Residence (Address)</b>								
Urban	98	34.0%	190	66.0%	Fisher =	0.12		
Rural	7	58.3%	5	41.7%			2.99	
<b>Internal displaced people (IDP)</b>								
Yes	9	56.2%	7	43.8%	$\chi^2 = 3.355$	0.067		
No	96	33.8%	188	66.2%				
<b>Did you or family member infected with cholera?</b>								
Yes	6	60.0%	4	40.0%	Fisher =	0.104		
No	99	34.1%	191	65.9%			2.842	
Total	105	35.0%	195	65.0%				

Significant at 0.05 level

## DISCUSSION

The main epidemics in Iraq were in the years of 1998 and 2007. These epidemics were due to destruction of the infra structures and the mobilization of people during the hot months and classically during September. So cholera outbreaks are irregular (Al-Abbassi *et al.*, 2005; Ministry of Health, 2015). Although Iraq was free of cholera during the year 2014, cholera epidemic occurred in the mid of September 2015. In 22 November 2015, a total number of 2810 laboratory-confirmed cases of Vibrio cholera were established at the Central Public Health Laboratory in Baghdad, and only 2 deaths due to cholera were reported. These cases were reported from 17 Governorates of the country, with the maximum number of cases in Baghdad [940] and Babylon [675] (WHO, 2015). In our study the educational level of the participants 112 (37.3%) were people with college degree, secondary school 84 (28.0%), primary school 45 (15.0%) while the least participants were others (higher educational degrees) 16 (5.3), illiterate 18 (6.0%), and those who can read and write 25 (8.3). This may be happened by chance and bias as the sample was chosen conveniently. Most of the respondents were employers 158 (52.7%), housewives 102 (34.0), while the least participants were the others (retired) 8 (2.7%), those with free jobs 14 (4.7%), and students 18 (6.0%). This is because housewives are the main caregivers for their children and have time to go to PHC more than other while students may be busy with their study while those with free jobs may be busy all the time with their work. Employers and retired may be due to chance or bias as the study sample was chosen conveniently. Most of the participants were from urban areas [288 (96.0%)] while rural area only [12 (4%)] this is due to bias as most of the PHC centers were chosen conveniently and were located in the center. The overall average knowledge was (60%) which is higher than that reported in a study carried out in Bangladesh and showed a response rate of (46%), (Tasnuva Wahed *et al.*, 2013) and higher than in (Nsungu, 1996) this may be due to recent epidemic that occurred in Iraq resulted in good knowledge of people and may be the educational level of people in Iraq better than the educational level in Bangladesh and central Africa. We found results where the overall average knowledge is higher than that in Iraq as in Tanzania (84.8%), (Veronica *et al.*, 2005) and Peru (Robert *et al.*, 1996), this may be because of recurrent out breaks of cholera in these regions and using different mass media programs may educate people more about cholera.

In our study the highest responses were on the general characteristics of cholera (75.7%) where most of the answers were on the most important risk factor for transmission which is dirty water and food (86.7%) that was higher than a study done in Iraq in 2010 where their responses was (62%) in the study group and (54%) in the control group (Maysaa Kadhdom and Sinai Waleed, 2010), and higher than Haiti (Communicating with Disaster Affected Communities, 2010; Valery *et al.*, 2010), this may be due to recent epidemic in Iraq and repeated information that was given in PHC centers and through different mass media by T.V and radio. (86.3%) said that rice watery stool is the main presenting symptom of cholera which is nearly similar to results in Haiti (89%) and in the control group in Iraq (90%). While it was higher than what found in Zanzibar (60%) (Christian Schaetti *et al.*, 2010), the study group in Iraq (72%) (Maysaa Kadhdom and Sinai Waleed, 2010), and in Bangladesh only (23%) of the respondents identifies cholera as watery diarrhea (Tasnuva

Wahed *et al.*, 2013). This may be due to the fact that the definition of cholera varies even in WHO documents, So the wrong answer may result in poor knowledge about cholera. Most of our participants knew that cholera is a communicable disease (85.3%) and that was higher than a study done in Bangladesh in 2016 where only (39%) said it is communicable (Charlotte *et al.*, 2016), most of respondents in our study knew the main rout of transmission which is waterborne (84.3%) and this was higher than what we found in Bangladesh in 2016 (Charlotte *et al.*, 2016), where only (71%) knew the main rout of transmission and this again may be due to the recent epidemic in Iraq. The lowest score in the general characteristics was on the causative agent of cholera, only (36.0%) said bacteria which was lower than a study done in Iraq in 2010 where both the study and control group (56%-47%) respectively (Tasnuva Wahed *et al.*, 2013), knew the causative agent. The reason is that they may choose the correct answer by chance or this information is irrelevant to the patients as patients pay more attention to the treatment and prevention of the disease. the lowest responses were on the part of complication (37.8%) the highest responses were on dehydration and shock (78.0%) which is higher than a study carried out in Bangladesh 2016 where only (71%) knew about dehydration and shock (Charlotte *et al.*, 2016) this may be due to recent epidemic in Iraq, death within several hours (47.3%) which is nearly similar to a study done in Bangladesh (47%)<sup>(22)</sup>, while least responses were on no complications (19.0%), unconsciousness (20.7%), and seizure (24.0%) which is lower than what we found in Bangladesh (71%) (Charlotte *et al.*, 2016). This may be due to poor knowledge about cholera complications as the patient may know mostly about dehydration and shock and don't know the others. In the part of prevention the highest responses were on dis-infecting water (84.7%) which is higher than in Bangladesh in 2013 (74%) (Tasnuva Wahed *et al.*, 2013), (80.3%) of the responses in our study were on hand washing where we found nearly similar results in Haiti (86.0%) identified hand washing as the main preventive method (Valery *et al.*, 2010).

In our study (69%) of the responses were on using vaccination as a preventive method, and this may be due to recent epidemic in our country and many people thought that vaccination is a very important protective method against the disease. (67%) of the responses were on cooking food thoroughly and avoid raw or undercooked food which is lower than a study done in Bangladesh in 2013 where (87%) of the responses were on food safety (Tasnuva Wahed *et al.*, 2013), this may be due to poor knowledge about how to prepare food in a correct manner. (65.7%) of the responses were on wearing gloves and (65%) of the responses were on carbage disposal while in Bangladesh study in 2013 only (7%) of the responses were correct on health education (Tasnuva Wahed *et al.*, 2013). In the part of dis-infection the highest responses were on using chlorination (67.3%) which was consistent with results from Haiti But higher than Napo River (36.9%) (Robert *et al.*, 1996), as this may be due to recent epidemic of cholera in our country, but it is lower than in Pueblo Libre (74.6%) as this may be people in our country use other methods of disinfection like boiling or bottled water. (53.3%) of the responses were on boiling water which is lower than a study done in Peru where (98.6%) in Napo River, (94.0%) in Pueblo Libre and (88%) in Tanzania and this may be chlorine tablets in our country easily accessible, affordable and free and it is easier to use than boiling water. The least responses in the dis-infecting methods was on sunlight exposure (6.0%) this may be due to the fact

that people don't believe it will decontaminate water and also not applicable for large amount and availability of other methods. In the treatment part the highest responses in our study were on using I.V fluid (65.3%) which is higher than in a study done in Bangladesh 2013 where only (19%) of the responses were on using I.V fluid (Tasnuva Wahed *et al.*, 2013), this may be in our country there is a strong believe in I.V fluid as a very effective method to cure the disease. (60%) of the responses were on using antibiotic to treat cholera, this may be due to recent epidemic in Iraq gave people more knowledge about the use of antibiotics. The least responses were on ORS (37.7%) and it is lower than Bangladesh where (92%) (Tasnuva Wahed *et al.*, 2013), and in Haiti where (90%) of the respondents had knowledge about ORS (Valery *et al.*, 2000), this may be due to poor knowledge of people in our country about the benefits of ORS in the treatment of diarrhea and their belief in I.V fluid as effective method for the treatment of cholera. Regarding the source of information as we see the highest score was on T.V mainly (42%) and it is similar to what we found in Haiti (Valery *et al.*, 2000), but it is higher than in Napo River (3.6%) as due to recent epidemic in our country so the informations were repeated frequently on T.V and other sources of mass media, while it was lower than Pueblo Libre (63.6%) (Robert *et al.*, 1996), as this may be due to availability of other mass media in our country other than T.V. PHC centers represents (36%) of the responses which is lower than T.V this may be due to that visual images and repeated information's through T.V made the information easy to remember and good feed back while in PHC centers there may be no time to repeat information because of the load and lectures about the disease given mainly during an epidemic. Friends and relatives represents (14%) in our study which is lower than in Pueblo Libre (75%) and Napo River (100%) may be people in our country believe that the information is better taken from T.V and PHC centers than from friends or relatives as it may be a wrong information. Journals represent (9.3%) in our study which is lower than in Pueblo Libre (40.9%) this may be due to the reason that not all people read journals as in Pueblo Libre while it is higher than in Napo River (7.3%) this is may be Napo River is a rural area so journals may not be available. According to radio, it represents (6%) in our study which is lower than in Pueblo Libre (70.5%) and Napo River (57.9%) this maybe in our country the main source of the information was through T.V followed by PHC centers .Hospital represents (2.7%) in our study which is lower than in Pueblo Libre (38.6%) and Napo River (70.2%) this may be people in hospital may not learn the information properly as in PHC centers because of load and doctors may be very busy so they can't repeat information to people.

The relationship between the sociodemographic characteristics and knowledge level of the participants. We found a significant association between the respondents' knowledge, gender and occupation. According to age group good knowledge was higher at age group >51 years (70.8%), 31-40 (68.8%), 41-50 (66.7%) while it was low in age group 18-30 (58.3%), this may be older age groups witnessed recurrent epidemics of cholera more than younger age group resulted in good knowledge among them and it is lower than in Tanzania<sup>(16)</sup>, this may be due to that doctors in PHC centers don't have time to repeat information due to load and the lectures about the disease given during the outbreak mostly than any other time and this may be younger age group in our country witnessed few cholera epidemics, but it is higher than in Bangladesh 2013 and this may be due to recent epidemic in our country

(Tasnuva Wahed *et al.*, 2013). According to gender good knowledge mainly found in females (72.3%) and higher than the males (48.9%) and the difference as we said before is significant this is higher than in Tanzania where the females' good knowledge (58.9%) and the males (Veronica *et al.*, 2015), (41.1%) and higher than Bangladesh 2013 (Tasnuva Wahed *et al.*, 2013), this is as females being the main caregivers and in charge of sanitation, food preparation and many other things. According to educational level good knowledge was seen mainly in people with college degree (71.4%) while lowest in those who can read and write (52.0%) this due to the difference in educational level but this lower than in Tanzania where the people with college degree their knowledge was (100%), and those who can read and write (93.8%) this may be in our country educational lectures and information needed to be repeated frequently not just during epidemics but all year round. Good knowledge was (62.5%) in others which represent higher educational level which is higher than in Tanzania where they represent (50%) and higher than in Bangladesh 2013 this may be due to higher educational level and recent epidemic in Iraq. Those who had primary school education represent (60%) of good knowledge and this lower than in Tanzania where they represent (98%) may be as we said before and higher than Bangladesh 2013 may be recent epidemic in our country is the reason for the good knowledge. Knowledge was lower in illiterate (55.6%) and lowest in those who can read and write (48%) this may be illiterate take the information from doctors and keep it well in their mind as they can't read or write but it is lower than In Tanzania where the illiterates' knowledge (96.6%) while those who can read and write (93.8%) may be due to the reasons mentioned above and higher than Bangladesh 2013 for the same reason mentioned above. According to occupation the highest level of good knowledge was among employers (70.3%), housewives (69.6%) and (62.5%) in others (retired) and the difference was significant, which is lower than in Tanzania where employers (97.5%), housewives (97.2%) and others (100%) this may be as we said this may be in our country the information should be given not only during epidemic time but instead they should be given all year round and these occupations represent adult age group so they may witnessed few epidemics of cholera. Knowledge was lowest in students (33.3%) and those with free jobs (14.3%) this may be those with free jobs are busy all the time and as result they can't go to PHC centers frequently also students busy with their study. According to residence good knowledge of people in urban areas (66%) is higher than in rural areas in our country (41.7%) this may be caused by bias as most of the PHC centers were chosen conveniently and located in the center but it is lower than in Pueblo Libre (78%), urban area in Peru and lower than Napo River (82%), a rural area in Peru, and this is because the success of the cholera prevention campaign in educating Pueblo Libre and Napo River populations is related to the different sources of information, which was shown to be more effective than single source programs (Robert *et al.*, 1996). The percentage of people who took the vaccine in our sample was (10%) while (90%) didn't take the vaccine this because most people in our country don't know about it and it was only available for special criteria of people

### Recommendations

we recommend strengthening of health educational activities in the PHC centers all year round not just during epidemics, thus improve knowledge of people about cholera and it's

prevention, more educational lectures should done through mass media such as (TV, radio, newspapers, and magazines, etc...) and the information must be scientific and authorized, Further studies are required in Baghdad and other governorates, where we need to include different sample of population.

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