Texila International Journal of Public Health
Volume 7, Issue 4, Dec 2019

Epidemiological Assessment of Knowledge and Risk Perception Towards Typhoid Fever among Gyadi-Gyadi Communities in Kano, Nigeria

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Abstract

Introduction: *Typhoid fever is a major public health problem in developing countries. Typhoid fever is transmitted by the feco-oral root through ingestion of contaminated food or water that contains Salmonella typhi. Poor knowledge and risk perception towards typhoid fever contributed to the prolonged transmission of diseases in the community. The aim of this study was to assess knowledge and risk perception towards typhoid fever among Gyadi-Gyadi communities in Kano, Nigeria.* ***Methodology:*** *A community based cross-sectional study was conducted in Gyadi-Gyadi from April, 2019 to May, 2019. Data was collected using a pretested structured questionnaire. Descriptive analysis was performed to obtain the frequency distribution of the variables.* ***Results: Results:*** *The result shows that 300 participants responded to the questionnaire. 165 respondents (55%) were male and the remaining 135 (45%) were female. Regarding sign and symptom most of 287 (95.7%) of the respondents have answered headache. Concerning risk perception, majority 160 (53.7%) agree that lack of hand washing practice contribute to typhoid fever infection* ***Conclusion:*** *The study revealed that the respondents have good knowledge towards typhoid fever. However, the risk perception status of the respondents towards typhoid fever is poor.* ***Recommendation:*** *Supportive supervision for health extension workers in order to strengthen effective health education to the community on the causes of the diseases and possible preventives measure.*

Keywords: *Knowledge; Risk Perception; Typhoid Fever, Gyadi-Gyadi, Kano, Nigeria.*

Background

Typhoid fever is a systemic prolonged febrile illness caused by certain Salmonella serotypes including *Salmonella typhi, S. paratyphi A, S. paratyphi B* and *S. paratyphi C*. It emerged as an important infectious disease in the early 19th century. The illness begins with mounting fever, headache, vague abdominal pain and constipation, which may be followed by appearance of rashes. During the third week, the patient reaches a state of prolonged apathy, toxemia, delirium, disorientation and/or coma followed by diarrhoea. If left untreated, it can lead to complications affecting various organ systems (Fauci et al., 2008). Infection occurs in all age groups with a higher incidence and more variable clinical presentation in children. Since the late 1940s typhoid fever was successfully treated with one of the several antibiotics, chloramphenicol, ampicillin and trimethoptrim-sulphamethoxazole. However, from 1990, multidrug resistant strains to the previously useful antibiotics have emerged, and treatment for such strains requires the use of more expensive quinolone antibiotics such as oral ciprofloxacin or third generation cephalosporins such as ceftriaxone (WHO, 2003). Human beings are the only reservoir and host for typhoid fever, and the disease is transmitted by faecally contaminated water and food in endemic areas especially by carriers handling food. The World Health Organization (WHO) estimates for annual global incidence of typhoid fever, about 21 million cases with >600,000 deaths. Cases are more likely to be seen in areas like India, South and Central America, and Africa with rapid population growth, increased urbanization, and limited safe water, infrastructure, and health systems (Willke et al., 2002, John et al., 2004).

DOI: 10.21522/TIJPH.2013.07.04.Art010
ISSN: 2520-3134

Typhoid fever is a major health problem in developing countries where safe water supplies and adequate sewage disposal are often lacking. Epidemiologic data on typhoid fever in endemic countries is lacking or incomplete. Case identification may be based on clinical, bacteriological or serologic diagnosis; or typhoid fever may be clumped with other diseases or conditions such as fever of unknown origin (Abucejo et al., 2001).

Typhoid fever has important socioeconomic impact because, most of the time, several months are necessary for a patient to recover and be able to work again. So accurate diagnosis of typhoid fever at an early stage is important not only for etiological diagnosis, but also to identify individuals that may serve as a potential carrier, who may be responsible for acute typhoid fever outbreaks (Gopalakrishnan et al., 2002). Several options exist for diagnosing enteric fever: clinical signs and symptoms; serological markers; bacterial culture; antigen detection; and DNA amplification. The clinical diagnosis of typhoid fever is difficult because the manifestations of the disease are diverse and there are many causes of prolonged fever in typhoid endemic regions.

Signs such as relative bradychardia or leucopoenia may be useful but give a low specificity. The culture of blood, bone marrow and stool are the most reliable diagnostic methods but these are expensive techniques and the infecting organism may be dead on arrival at the hospital if the patient has taken antibiotics before clinical samples can be taken. Serological diagnosis is predominantly by the Felix-Widal test, first standardized in the 1950s. Although ELISA and immunoblotting suggest possibilities, the commercially available kits for the serodiagnosis of enteric fever have not performed well in large studies (Wain and Hosoglu, 2008).

Typhoid fever remains a major public health problem in the developing world with very poor estimates of the number of cases and deaths annually. Continued research on the epidemiology, ecology, pathogenesis, diagnosis, treatment and prevention of typhoid can most optimally be pursued in the endemic regions which, unfortunately, also suffer from a lack of research capacity, funding support, and institutional infrastructure. Much needs to be done to promote and strengthen typhoid fever and other infectious disease research in these regions if true progress is to be made. Information across sub-Saharan Africa is very scarce and the issues clearly require urgent and rapid action, particularly in West and East Africa (Ethiopia and Kenya) which seems to have a high burden of typhoid fever (Pang, 2008).

So, this study is aimed at Epidemiological Assessment of knowledge and risk perception towards typhoid fever among Gyadi-Gyadi communities in Kano, Nigeria.

Methodology

Study area and study design

The study was conducted in Gyadi-Gyadi which is one of the towns found in Tarauni local government Kano state. According to 2006, national housing and population census the projected estimated population of the Gyadi-Gyadi was 65,000. A community-based cross- sectional study was conducted using interviewer-administered questionnaire from April, 2019 to May, 2019.

Sample size determination

In this study, manual calculation of the sample size using Morgan and Krejcie (1970) formula was used for sample size determination as stated below:

$S= X^2NP (1-P) \div d^2 (N-1) + X^2P (1-P)$

Where:

S = Required sample size

X^2 = The table value of the chi-square at desired confidence (3.841)

N = Study Population size (1367)

P = Population proportion assumed to be 0.50 since this would provide maximum sample size

d^2= Degree of accuracy of the result expressed as proportion 0.050

$$\frac{3.841\times1367\times0.5\times0.5}{0.0025\times1366+3.841\times0.5\times0.5}$$

$$\frac{1312.66175}{4.37525} = 300$$

Hence 300 respondents

Inclusion and exclusion criteria

Resident individuals aged 18 years and above and willing to participate were included in the study. Individuals who stayed as guests in the selected households, those who were <18 years of age and who had chronic illnesses were excluded from the study.

Data collection

Data was collected from eligible and willing participants using a pre-tested, structured questionnaire, adapted from the sample questionnaire in the guide to developing knowledge, attitude and practice surveys developed by the World Health Organization and Stop Typhoid fever. Socio-demographic information including age, gender, occupation, education and socio-economic status were collected. The knowledge of the participants on symptoms suggestive of Typhoid fever, cause of Typhoid fever, treatment and preventive measures, attitude and practices regarding Typhoid fever disease were also collected.

Data analysis

Data were analyzed using Statistical Package for Social Science (SPSS) software version 16.0 at that time with the help of the Statistician. The descriptive statistical method was used to analyze frequencies and percentages.

Ethical considerations

This study was conducted only after obtaining approval from Gyadi-Gyadi District Head.

Results

A total of 300 respondents were interviewed, giving 100% response rate. The majority, 165 (55%) of the respondents were males. Among all, 75(25%) of respondents were 31-35 years of age. Of the study subjects, 195 (65%), were married. The socio-economic characteristics of the study showed that, among all respondents, 180(60%) of respondents attended formal education, among this 145(48.3%) of respondents were secondary school completed, 35(11.7%) of respondents were primary school completed, while 120(40%) of respondents reported that they were took informal education (were illiterate and only read and write). Similarly, results of occupational status of respondents indicated, 200(66.7%) of respondents were Government employee, 5 (1.7%) were farmers, 70(23.3%) were Merchants and 25(8.3%) were House wives (Table 1).

Table 1. Socio demographic characteristics of the respondents (n=300)

Characteristics	Frequencies (n=300)	Percentages %
Gender		
Males	165	55
Females	135	45
Ages		
20-25	40	13.3
26-30	65	21.7
31-35	75	25
36-40	72	24
41+	48	16
Marital Status		
Married	195	65
Single	85	28.3
Divorce	8	2.7
Widowed	12	4
Education		
Illiterate	75	25

DOI: 10.21522/TIJPH.2013.07.04.Art010
ISSN: 2520-3134

Can read and write	45	15
Primary	35	11.7
Secondary and above	145	48.3
Occupation		
House wife	25	8.3
Farmers	5	1.7
Government employee	200	66.7
Merchants	70	23.3

Knowledge of the respondents towards typhoid fever

From a total of three hundred (300) household respondents' majority 185 (61.7%) knew that typhoid fever is caused by germ. Concerning transmission majority 195 (65%) of the respondents have answered typhoid fever is transmitted by drinking contaminated water. Regarding sign and symptom most of 287 (95.7%) of the respondents have answered head ache. Concerning the way of prevention majority 279 (93%) answered drinking boiled water, and about 225 (75%) have answered hand washing (Table 2).

Table 2. Knowledge of the respondents towards typhoid fever (n=300)

Characteristics	**Frequencies (n=300)**	**Percentages (%)**
Typhoid fever caused by germs		
Yes	185	61.7
No	115	38.3
Typhoid fever transmitted by drinking contaminated water		
Yes	195	65
No	105	35
Typhoid fever transmitted by Eating contaminated food		
Yes	178	59.3
No	122	40.7
Fever the symptom of typhoid fever infection		
Yes	205	68.3
No	95	31.7
Loss of appetite symptoms of typhoid fever infection		
Yes	194	64.7
No	106	35.3
Head ache, symptoms of typhoid fever		
Yes	287	95.7
No	13	4.3
Hand washing prevent typhoid fever infection		
Yes	225	75
No	75	25
Drinking boiled water prevent typhoid fever infection		

Yes	279	93
No	21	7
Proper disposal of waste prevents typhoid fever infection		
Yes	275	91.7
No	25	8.3

Risk perception level of the community towards typhoid fever

From a total of three hundred (300) house hold respondent's majority 285 (95%) perceived that typhoid fever is a serious disease. Concerning the transmission, 155 (51.7%) of the respondents do not know that infected person can transmit the diseases to the health person and also 164 (54.7%) of the respondents perceived that exposure to sun light contribute for typhoid fever and also majority 160 (53.7%) agree that lack of hand washing practice contribute to typhoid fever infection (Table 3).

Table 3. Risk perception towards typhoid fever among community (n=300)

Characteristics	Frequencies (n=300)	Percentages (%)
Typhoid fever is a serious disease		
Yes	285	95
No	15	5
Exposure to sun does not contribute to typhoid fever infection		
Yes	136	45.3
No	164	54.7
Infected person transmits the diseases to health person		
Yes	145	48.3
No	155	51.7
Lack of enough and reliable water sources contribute to typhoid fever		
Yes	259	86.3
No	41	13.7
Poor sanitation practices contribute to typhoid fever infections		
Yes	210	70
No	90	30
Lack of hand washing practices contributes to typhoid fever		
Yes	160	53.7
No	140	46.7
Lack of pit latrines in each home contributes to typhoid fever		
Yes	189	63
No	111	37
Eating un washed raw vegetables contribute to typhoid fever		
Yes	231	77
No	69	23

DOI: 10.21522/TIJPH.2013.07.04.Art010
ISSN: 2520-3134

Water source and sanitation

Majority 204 (68%) of the respondents obtained drinking water from pipe line, only 194(64.7%) of the respondents treat their drinking water. Regarding hygiene majority 285 (95%) of respondents wash their hand by soap and water after utilization of toilet facility. Majority 287 (95.7%) of the respondents have private toilet, from them 180 (60%) had pit latrine type of toilet. Concerning west disposal system majority 199 (66.3%) of the households have place for waste disposal at their compound. Concerning the end disposal of waste 148 (49.3%) of the respondents dispose solid waste on open field. Regarding liquid waste 208 (69.3%) of the respondents dispose on open field (Table 4).

Table 4. Water, Sanitation and Hygiene (WASH) practice among household in Gyadi-Gyadi communities in Kano, Nigeria (n=300)

Characteristics	**Frequencies (n=300)**	**Percentages (%)**
What is the main source of your drinking water?		
Pipe line	204	68
Public stand point	96	32
Always treat your drinking water?		
Yes	194	64.7
No	106	35.3
Mainly how do you treat drinking water?		
Boiling	188	62.7
Chemical (Chlorine, bishangari)	112	37.3
Wash hands by soap and water before preparing food		
Yes	189	63
No	111	37
Wash your hands by soap and water before meal		
Yes	205	68.3
No	95	31.7
Is there private latrine facility for the family		
Yes	287	95.7
No	13	4.3
If yes what is the type of latrine		
Pit latrine	180	60
VIP	97	32.3
Water wash	23	7.7
No private functional latrine where does the family use		
Open field	95	31.7
Relative latrine	7	2.3
Public (communal)	198	66
Wash hands by soap and water after using the toilet		
Yes	285	95
No	15	5
Place to store wastes at house hold level		
Yes	199	66.3

No	101	33.7
There separate container for different types of waste		
Yes	250	83.3
No	50	16.7
Is the container covered		
Yes	164	54.7
No	136	45.3
Where do you dispose solid waste at the end		
Open field	148	49.3
Local pit	96	32
Municipality	51	17
Compost	5	1.7
Where do you dispose liquid wastes at the end		
Open field	208	69.3
Local pit	81	27
Link to sewage system	11	3.7

Discussion

The community-based cross- sectional study conducted among community at Gyadi-Gyadi town revealed the socio demographic characteristics of the study participants as follows out of three hundred participants above 55% were male. Regarding the last educational status of the participants majority 48.3% were secondary school. The result of this study is almost in line with the study done in Nigeria 61% and 20% [JO, 2015].

In this community based cross sectional study attempted to identify the knowledge and risk perception towards typhoid fever among community at Gyadi-Gyadi town. Regarding knowledge towards typhoid fever the study found that about 75% of the respondents have good knowledge related to typhoid fever. The result of this study is higher than the study done in Zimbabwe 33% [Bara, 2016]. The difference is might be due to the effort of health extension worker implementation in Nigeria.

Concerning on the transmission majority 65% and 59.3% of the respondents know that typhoid fever is transmitted by drinking contaminated water and eating contaminated food respectively. The result of this study is higher than the study done in Tanzania which is 42.5% [Malisa and Nyaki, 2010]. The difference is might be due to implementation of health extension worker in the area.

Regarding the causes of typhoid fever about 61.7% of the respondents knew that typhoid fever is caused by germ. The result of this study is slightly higher than the study done in Elmina in the Central Region of Ghana 49.2% [Ethel Osei-Tutu, 2011]. The difference is might be due to the socio demographic characteristic.

Concerning the sign and symptom of typhoid fever about 64.7% were answered loss of appetite. The finding of this study is higher than the study done in Nigeria 6.3% [Okore Oghale, 2015]. The difference is might be due socio demographic characteristic.

Concerning the way of prevention of typhoid fever, the majority 279 (93%) answered drinking boiling water, who said proper waste disposal were 275 (91.7%), and 225 (75%) have answered hand washing. The result of this study is higher than the study done in Zimbabwe 54% drinking water from safe source, 54% washing hand with soap and 30% proper west disposal [Bara, 2016]. The difference is may be due to effort of the health extension worker in the area.

Concerning the risk perception on the transmission of the diseases about 48.3% thought carriers could transmit the disease to others. The result of this study is almost in line with the study done in Elmina Ghana which about half of the respondents thought carriers could transmit the disease to others [Ethel Osei-Tutu, 2011]. The difference is may be due to socio demographic characteristic of the respondents.

DOI: 10.21522/TIJPH.2013.07.04.Art010
ISSN: 2520-3134

Regarding perception on hygiene majority 70% of the respondents agree that poor sanitation practices among households in the community contribute to the spread of typhoid fever. The result of this study is slightly higher than the study done in Kenya which was 48% [Khanyelele, 2014]. The difference is may be due to the socio demographic characteristic of the respondents.

Concerning the risk perception towards typhoid fever, the study showed that majority 95% of the respondent perceived typhoid fever as serious diseases. The result of this study is slightly higher than the study done in Zimbabwe which was 70% [Bara, 2016]. The difference is may be due to effort of the health extension worker in the area.

Regarding water supply and toilet facility in the study area the result of the study showed that majority 68% of the respondents obtained drinking water from pipe line and also about 60% of the respondents used pit latrine type of toilet. The result of this study is different from the study done in Kenya 54.6% pipe source for drinking water and 83% used pit latrine [Nguri, 2016]. The difference is may be due to the study area.

Regarding treatment of drinking water and the means of treatment the study revealed that only 64.7% treat their drinking water, by different means such as 62.7% used boiling, 37.3% used different chemical. The result of this study is higher than the study done in Tanzania 42.5%, 30% and 12.5% respectively [Malisa and Nyaki, 2010]. The difference is may be due to the difference in the study area and period.

Concerning hygiene, the study result showed that majority 95% washed their hand by soap and water after using toilet facility. The result of this study is almost in the same line with the study done in Nigeria 221 (94.0%) [Marie-Rosette, 2017].

Conclusion

The study revealed that, the respondents has good knowledge towards typhoid fever. However, majority have poor risk perception towards typhoid fever. Therefore, according to this research education has its own contribution for risk perception. In general, according to the study the risk perception level of the community is poor. Since knowledge and risk perception are the key factor for the control and prevention of typhoid fever, strengthen the awareness of the community towards typhoid fever is mandatory.

Recommendations

- Local health desk should strengthen supportive supervision for health extension workers in order to strengthen effective health education to the community on the causes of the diseases and possible preventives measures.
- Health institution of the area should include health education program.
- The municipal office of the town should work on the waste disposal system.

Acknowledgments

I am grateful to thank the study participants and acknowledge the team of research assistants.

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