

**Research Article**
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## Community Health Awareness and Health Education on Diphtheria Among Residents of a Local Government Area in Edo State, Nigeria

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### ABSTRACT

This study investigated community health awareness and health education on diphtheria among residents of a local government area in Edo State. Two research questions and two hypotheses were formulated for the study. The population comprised 117,209 from which a sample of 399 was selected by means of cross sectional descriptive research design. Data collection was by means of a structured questionnaire and analyzed using descriptive and inferential statistics with hypotheses tested at 0.05 level of significance. Reliability coefficients of 0.84 and 0.79 were obtained for awareness and health education respectively. Results revealed low awareness on diphtheria among majority (93.5%), 24.1% had moderate awareness, 2.0% had high awareness. 93.5% claimed there had never been community awareness campaign on diphtheria in their community, 85.7% reported never to have attended seminar/health talks on diphtheria infection. Level of education on diphtheria was low (21.2%). Majority of the respondents (61.4%) had low level of education on diphtheria. Gender and educational background were significantly associated with community health awareness on diphtheria ( $p = .000$ ). The study recommends that since the level of health awareness and education was low among the population, nursing practitioners should consider community health awareness campaign on diphtheria in communities in order to raise awareness. Females and those with low educational background, should be targeted to ensure they seek information on diphtheria to protect their health.

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**Received:** February 20, 2024; **Accepted:** February 26, 2024; **Published:** March 11, 2024

**Keywords:** Community, Health Awareness, Health Education, Diphtheria

### Introduction

The necessity of health to every human cannot be overemphasized. Without health, humans are not able to function and carry on with daily activities [1]. This infers that health comprises various components, absence of any will result in a state of unwellness in the individual. A better way of maintaining optimal health is to ensure that disease or infirmity is prevented. Education on issues relating to health plays key roles in achieving this state. For individuals to enjoy good health there is need for knowledge on what health entails and how to maintain it. The goal of health education is to engage and empower individuals to imbibe healthy lifestyle and make changes that reduce the risk of developing diseases [2]. Community health education serves the purpose of providing necessary information about health to members of a community in order for them to observe norms of good health and to take preventive measures against diseases [3]. Within a community, health education encompasses many areas of life, including awareness of underlying factors of diseases. This education may cover topics such as nutrition, substance abuse, maternal and infant health, sexual and reproductive health, and a host of others. It utilizes tools such as advocacy, radio dramas, talk shows, health fairs and advertising campaigns [4]. Community health awareness serves the benefit of availing members of a

community opportunity the know-how about health and/or safety-related issues [5]. It aims to facilitate life changes and could also be achieved by providing essential services such as screenings and counselling. Health education is concerned with promoting health as well as reducing behaviour-induced diseases [6]. In other words, health education is concerned with establishing or inducing changes in personal and groups attitudes and behaviour that promote healthy living (in its most usual form it concentrates on developing such health practices as are believed to bring about the best possible state of well-being).

In developing countries where health facilities and services are limited, community health awareness becomes even more important to enable the populace maintain health and wellbeing [7]. Diphtheria, one of such public health disease is an acute infectious disease majorly caused by toxin-producing strains of *Corynebacterium diphtheria* and in some instances by *C. ulcerans* and rarely by *C. pseudo-tuberculosis* that has the capability of affecting the respiratory tract (respiratory diphtheria) and the skin (cutaneous diphtheria). The mucosa of the eye, genitals, ear may be affected in rare circumstances [8]. Factors such as close contact with infected persons, non-vaccination coverage, crowding, eating infected dairy products have been identified as risks for transmission of diphtheria. Apart from medical management of diphtheria infection, immunity against the disease-causing organism through vaccination has been recognized as effective

control measures [9,10].

In the pre-vaccine era, diphtheria was reported to be a major cause of childhood mortality. However, with the discovery and introduction of vaccine; diphtheria-tetanus-pertussis (DTP), the incidence was reported to reduce, especially in high income countries [11]. In low-resource countries, the incidence was reduced after the launch of the Expanded Programme on Immunization (EPI) in 1974 by the WHO, which recommended 3-dose series of DTP to all infants.

Diphtheria is endemic in Asia, Middle East, Latin America and across the African continent, where the vaccines are reported to be in low supply and uptake low. In Nigeria, there have been records of diphtheria outbreak in a village known as Kimba in Borno State where a total of 98 cases were reported with 64.3% being children under the age of 10 who were unvaccinated. Similar incidence was recorded in Kano and Lagos State [12]. Maternal knowledge, attitude, and perception about childhood routine immunization program in Atakumosa-west Local Government Area of Osun State, in Southwestern Nigeria, indicated that 76% had good knowledge of Routine Immunization (RI). Ninety-six percent (96.4%) stated that immunization is beneficial to children while 98.5% affirmed the safety of childhood vaccines [13]. Health care options and factors influencing health seeking behaviour in a rural community in Nigeria. Indicated that patent medicine store was the most utilized source of health care (42.1%), and 36.8% of respondents sought health care in the hospital [14]. Females tended to seek health care from hospitals and patent medicine store compared to males. The study concluded that rural dwellers mainly seek healthcare from patent medicine stores.

Community awareness about Diphtheria prevention and control in Hodeidah, Yemen showed no significant difference in mean awareness between both genders of the respondents were found [15]. In the same light, knowledge and coverage of vaccination against tetanus, diphtheria, and pertussis among medical students of Karachi, Pakistan, indicated 44.4% of the respondents were aware of the mode of transmission of diphtheria being through contact with aerosol and nasal discharge respectively [16]. Similarly, on health education and community awareness of the disease, and coverage of vaccination against tetanus, diphtheria, and pertussis among medical students of Karachi, Pakistan, 44.4% of respondents were aware of the mode of transmission of diphtheria being through contact with aerosol and nasal discharge respectively [16].

The impact of community-based health education (CBHED) in the utilization of primary health care in the Nigerian population [17]. Result indicates no relationship between the age of the study participants and their level of participation nor relationship between the source of information and participation in PHC. The study concluded that there is a need to extend the CBHED approach to other health-related services which would target community-level implementation. Similar study by in Delhi, India revealed significant increase in knowledge on cause, symptom perception and mosquito behaviour in terms of breeding and biting habits [18]. Practice of personal protection measures increased significantly after intervention compared to the routine programme.

In Nigeria, diphtheria vaccination remains one of the five vaccines on the childhood immunization schedule. Unfortunately, the success of diphtheria vaccine and other preventive measures in reducing incidence of diphtheria, have not yielded much results as the disease still remains a public health concern, especially

in low and middle income countries [9-20]. Several factors such as maternal education, false beliefs/ignorance, mistrust/misinformation, adverse effects following immunization, shortage of vaccines, distance to health care facilities, especially in rural/remote areas were adduced to contribute directly or indirectly to the outbreak of diphtheria. Awareness and education about the disease could be impeding efforts at preventing outbreak in communities [9]. Studies on community awareness and education about infectious diseases in different localities, has reported little on diphtheria among community members in Egor Local Government Area, Edo State, hence this study aim to fill the gap. If health is a precious asset, then education on health is indeed apt now than ever before because it has huge impact on people's attitudes towards healthy behaviour and practices. In addition, health education offers the necessary support for individuals in a community in maintaining their health and well-being.

The main objective of this study was to assess community health awareness and health education on diphtheria among residents in two communities in a local government area in, Edo State. The hypothesis formulated for the study was, to test if there was any significant relationship between level of community health awareness on diphtheria and the gender of residents of two communities in a local government area in Edo State.

It is believed that the outcome of this study will be of immense benefit to individuals, nursing practitioners, healthcare workers, policy-makers, health advocates, various ministries of health and the larger society as it will highlight the importance of seeking information and knowledge on diphtheria to take proactive steps in other to avoid negative health outcome associated with diphtheria.

## Methods

**Design:** A cross sectional descriptive survey was adopted for the study to explore the research objectives across the different strata that make up the population.

**Research Setting:** This research was carried out in Uselu and Egor community in Egor Local Government Area (LGA) of Edo State. This LGA is one of the eighteen LGAs in Edo State, referred to as the heartbeat of Nigerian 36 states including Abuja. The LGA is located in the Southern senatorial district of the state, a metropolitan city, though with semi-urban areas in the interior. Its population is estimated at 343,202 (NPC,2023) [19,20]. Egor LGA is divided into ten wards, namely; Uselu I, Uselu II, Egbareke, Uwelu, Oliha, Egor, Ugbowo, Okoro, Otubu, Ogida/Use. It is inhabited mainly by the Bini-speaking ethnic group, though other ethnic groups are resident in the area who work as artisans and government officials.

## Target Population

Comprised of residents of Uselu and Egor Communities in Egor Local Government Area, Benin City, Edo State, whose population is estimated to be 117,209 (Egor Local Government, 2023) [20]

## Inclusion Criteria

All adults above 18 years of age residing in Uselu and Egor Community for a period of over one year from the date of the study.

## Sample Size

A representative sample was taken from the entire population. This was achieved by applying the Taro Yamme formula in order to determine the sample size [21]. The formula is stated as:

$$n = \frac{N}{1 + N(d)^2}$$

Where; N = population size = 117,209; n = sample size; d = level of precision = constant = 0.05

### Sampling Technique

A systematic sampling technique was utilized for this study. The first step involved identification of quarters/divisions in the studied community (Uselu and Uwelu Communities). In the second step, streets that make up the various quarters were identified. Two streets each, was selected from the various quarters. This was achieved through purposive sampling where the researchers picked a street and skipped three streets before picking another. The third step involved selection of houses from the selected streets. A systematic sampling technique was utilized, where every 5th house from the beginning of the streets was selected. The fourth step involved selection of respondents from the selected houses. This was achieved using a convenient sampling technique, individuals who were available at the time of the exercise were after due permission was given.

### Instrument for Data Collection

A structured self-developed questionnaire designed in line with research objectives was used. It comprised three sections: A, B and C. Section A: comprised of items on socio-demographic information of respondents Section B: included items on the level of community health awareness on diphtheria. Section C: consisted of items on level of health education on diphtheria. They were constructed using a 4-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD). The instrument was administered directly to the respondents, and assistance was given when needed by the two trained research assistants

### Validity and Reliability of The Instrument

for accuracy and objectivity an expert in public health made inputs; while reliability, was through a test retest method with 5% of the sample was administered to residents of Ogida Community, Benin City who were not part of the study but share similar characteristics with the study population. Data collected from the two exercises were analyzed using the Kuder-Richardson-20 (KR.20) and a reliability coefficient of 0.77 was obtained for items on awareness and 0.82 for items on level of education, thus indicating high reliability.

### Method of Data Collection and Analysis

Data was collected through face-to-face administration of questionnaire to respondents. The purpose of the research was explained in simple language, after which a copy each was given to individual respondent and an on the spot retrieval was done immediately to avoid loss. Collected data was analyzed using Statistical Package for Social Science (SPSS. 22.0). Categorical variables were analysed using Chi-square statistics. Hypotheses were tested at  $p < 0.05$ .

### Ethics

A written permission/and ethical clearance was obtained from Efor LGA Health Authority. Voluntary participation/informed consent, was given by the respondents after gaining entry into the community through the various community chiefs (Odionwere) Confidentiality/anonymity of respondents were all duly adhered to by not coaxing them nor asking for names on the forms.

### Result

Four hundred and forty questionnaires were administered, with a return rate of 90.7% after data cleansing, giving a total of 399.

Table 1 Demographic details of the respondents. Majority of the respondents 53.4% were females, while 46.6% were males. Age distribution showed that majority 30.1% were 42 years and above, the least was 22.1% of those within the age bracket of 18-25 years. Educational qualification indicated that majority 236 (59.1%) had secondary education, one hundred and fifty (37.6%) were into business, but 55 (13.8%) reported being unemployed. Religious affiliations showed that majority 281 (70.4%) were Christians, while 5(1.3%) are pagan and 3 (08%) belong to other religions respectively

**Table 1: Demographic Characteristics (N= 399)**

Variable	Frequency	Percentage	No response
<b>Sex</b>			
Male	186	46.6%	06
Female	213	53.4%	
<b>Age</b>			
18 – 25 years	88	22.1%	03
26 – 33 years	97	24.3%	
34 – 41 years	94	23.5%	
42 years and above	120	30.1%	
<b>Educational Background</b>			
Primary School	64	16.0%	08
Secondary School	236	59.1%	
Tertiary Education	99	24.8%	
<b>Occupation</b>			
Self-employed/Artisan	115	28.8%	17
Civil servant	79	19.8%	
Business	150	37.6%	
Unemployed	55	13.8%	
<b>Street of Residence</b>			
Edaiken Street	62	15.5%	-
Iyase Street	55	13.8%	
Otete Street	61	15.3%	
Etinosa Street	47	11.8%	
Anigboro Street	51	12.8%	
Ebo Street	46	11.5%	
Odiase Street	21	5.3%	
Igbinoba Street	56	14.0%	
<b>Religion</b>			
Christianity	281	70.4%	-
Paganism	05	1.3%	
African Religion	51	12.8%	
Islam	59	14.8%	
Others	03	0.8%	

Table 2 showed the level of awareness of respondents on diphtheria. Correct/positive responses to items ranged from 10.8% to 30.2%. Correct responses for all items were below 50%. Average correct response for all items was indicated as 21.5%, which falls within the low category, inferring that respondents had low awareness on diphtheria of correct/positive responses on the 5 items raised ranged from 10.5% - 30.6%. It was observed that percentage correct response for item 17, 18, 19, 20 and 21 were 21.6%, 30.6%, 23.6%, 10.5% and 19.5% respectively. The average value for all items was 21.2%. These values fall within the low category, which infers that respondents demonstrated low level of education.

**Table 2: Awareness on Diphtheria (N=399)**

Variable	Correct/positive response F (%)	Incorrect/Negative responses F (%)	% positive/correct responses
Have you heard of diphtheria before?	121	278	30.2%
Diphtheria is caused by _____	43	356	10.8%
Diphtheria can be transmitted through cough, discharge from nose of an infected person	89	310	22.3%
Diphtheria infection is currently in Nigeria.	112	287	28.1%
Diphtheria infection can be transmitted through air.	97	302	24.3%
Children are at greatest risk of diphtheria infection.	75	324	18.8%
<b>Symptoms/Complications</b>			
A person infected with diphtheria shows symptoms between ____ and ____ days.	53	346	13.3%
Diphtheria infection could result into fever.	107	292	26.8%
Diphtheria infection can lead to heart problem.	72	327	18.0%
Diphtheria infection can result to throat problem.	87	312	21.8%
<b>Prevention/Management of Diphtheria</b>			
Diphtheria can be prevented through _____	110	289	27.6%
Diphtheria vaccine is available in Nigeria.	87	312	21.8%
Diphtheria can be treated.	64	335	16.0%
<b>Average</b>			<b>21.5%</b>

**Awareness Scores at 0-5 CI**

**Low: 0 – 39.9%; Moderate /Average: 40% - 59.9%; High: 60% - 100%**

Table 4 showed that majority of the respondents (61.4%) scored between 1 – 2 out of a possible 5. This value falls within the low category. Also, 30.1% scored 3 out of a possible 5, which infers average level of education on diphtheria. More so, 8.5% scores between 4 and 5, which is interpreted as high level of education on diphtheria. This values showed that majority of the respondents had low level of education on diphtheria.

**Table 3: Level of Health Education on Diphtheria**

Variable	Correct Responses F (%)	Incorrect Responses F (%)	% correct responses
Diphtheria can be contracted through eating of infected dairy products such as milk.	86	313	21.6%
Diphtheria infection could spread faster as a result of _____	122	277	30.6%
Diphtheria infection can lead to swollen neck/bull neck.	94	305	23.6%
How many primary/initial doses of diphtheria vaccine is needed for children in order to be immune to diphtheria?	42	357	10.5%
The recommended age to initiate diphtheria vaccine for children is _____	78	321	19.5%
<b>Average</b>			<b>21.2%</b>

Scores: 1-2 = Low                      3 = Average;                      4 & 5 = High;  
 – 39.9% = Low                      40% - 59.9% = Average                      60% - 100% = High

Table 3 indicates the level of health education on diphtheria. It showed that the percentage

**Table 4: Level of Education (According to Individual Scores)**

	Frequency	Percentage
Low Education (scores 1 – 2)	245	61.4%
Average Education (Score 3)	120	30.1%
High Education (Scores 4 & 5)	34	8.5%

Table 5 showed that majority of the respondents 373 (93.5%) claimed there had never been awareness campaign on diphtheria in their community. Also, majority (85.7%) reported that they have never attended seminar/health talks on diphtheria infection within or outside the community.

**Table 5: Health Education on Diphtheria**

S/N		Yes F (%)	No F (%)
	Have there ever been awareness campaign on diphtheria in your community?	26 (6.5%)	373 (93.5%)
	Have you ever attended seminar/health talks on diphtheria infection within or outside your community?	57 (14.3%)	342 (85.7%)

Table 6 shows  $\chi^2$  value for association between level of community health and gender was 23.1, while p-value was .00. Since this value is less at 0.05 level of significance, it infers that there is a significant association between the two variables. Also  $\chi^2$  value for association between level of community health and educational background was 86.1, while p-value was .00. Since this value is less at 0.05 level of significance, it infers that there is a significant association the two variables.

**Table 6: Association Between Community Health Awareness and Demographic Variables (Gender and Educational Background)**

Demographic variable	N	Community health awareness			$\chi^2$	p-value
		Low	Moderate	High		
<b>Gender</b>						
Male	180	154 (136.7)	24 (43.6)	06 (3.71)	23.1	.00
Female	213	141 (158.3)	70 (50.4)	02 (4.3)		
<b>Education Background</b>						
Primary Education	57	55 (43.5)	02 (13.4)	01 (1.19)		
Secondary Education	235	198 (176.1)	36 (54.1)	01 (4.81)	86.1	.00
Tertiary Education	99	40 (73.4)	52 (22.6)	06 (2.01)		

## Discussion

This study assessed community health awareness and health education on diphtheria among residents of a local government area in Edo State. Results revealed that majority were females, who had secondary school education, but were engaged in one business. or the other This is in line with studies that reported females being more involved in health issues than males as it serves the basis for the full promotion and improvement of the status of women [22]. Education of females has now been recognised as a fundamental tenet of development strategy. The population of Nigeria has put females as been average the males at 49% to just 50.9% [19].

The level of community health awareness on diphtheria revealed that majority of the respondents had low awareness about the causes and transmission of the disease. Furthermore, awareness on symptoms and complications was generally low. This finding is in agreement with the one in Yemen that reported low/poor awareness on prevention and control of diphtheria in three districts in Hodeidah district but contrasts the one done in Osun state in Osun State Nigeria that assessed knowledge and risk factors of Lassa fever (LF) among household members in a rural community in Edo State, Southern Nigeria [15-17]. The study reported 86.8% were aware

of Lassa fever, and 71.8% had low risk assessment score for LF. Other reasons attributed to low awareness on diphtheria in this study was poor sensitization of the population on diphtheria infection. Community mobilization as well as sensitization is best achieved through various media which was lacking in these communities. This supports findings that examined the impact of community-based health education in the utilization of primary health care in the Nigerian population. No relationship between the source of information and participation in PHC was reported. Though the electronic media was the major source of information on diphtheria, the reason for the low percentage of people who had information on diphtheria from healthcare practitioners was as a result of low health-seeking behaviour of the population such that they hardly consult with healthcare professionals except on occasions they consider serious. This is in line with a study in Delhi, India on impact of health education-based intervention on community's awareness of dengue, and concluded that health education-based interventions are instrumental in improving people's knowledge and behaviour. but contradicts that on awareness of influenza, pneumonia, and vaccination intention in two regions in Jiaying City, Zhejiang Province in China [18-24]. The main reason for not getting vaccinated was that participants



thought they were in good health and would not become sick easily.

On level of awareness on health education, the study showed that respondents had low level of awareness and education on diphtheria. This is contrary to report of moderate level of knowledge/education on diphtheria among a population in Karachi, Pakistan [16]. The reason for the low level of education on diphtheria in this present study was as a result of the fact that the studied population did not consider diphtheria as been endemic and worth seeking education and information about. This was in contrast to report that assessed awareness and perception regarding health insurance among community people in a municipality of Mahottari district of Nepal and concluded that education level and occupation has influence on the level of awareness and perception of health insurance [23].

Association between community health awareness and gender was significant association ( $p < 0.05$ ) as gender had influence on level of community health awareness on diphtheria. This finding did not agree with a Yemen community study that reported no significant association in awareness on prevention and control of diphtheria between males and females [15].

### Implications to Nursing Practice

There is need for nursing practitioners to consider community health awareness campaign on diphtheria in the study areas and other communities in other to raise awareness, targeting females and those with low educational background. Government should intensify adverts in the media, especially in local languages to simplify information on diphtheria in order to boost level of awareness. Public health nurses should consider collaborating with community leaders in other to disseminate information on diphtheria to improve level of education of the population.

### Limitations of the Study

First, this study could not be generalizeable to the whole of Edo state as only two communities were used. Also, there could be difficulty for respondents to immediately recall some events which could have influenced their responses.

### Recommendations

Based on the findings of this study, the following are recommended. Federal and state Ministries of health should endeavour to put in place programmes that ensures that sensitization of the population on diphtheria is given urgent attention.

Members of the public should observe and seek out information on diphtheria in other to protect their health and avoid adverse outcome association with contracting diphtheria.

### Suggestion for Further Studies

Based on the few LGA used for this study, a more holistic investigation could be done by exploring the Edo state based on its senatorial districts on the health-seeking behaviour of residents in the district.

### Authurs' Statement

#### Acknowledgements

Our sincerer thanks to the management of the Egor LGA and the communities where the study was carried out.

#### Funding

None

### Conflict of Interest Statement

The authors declares no conflict of interest

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