**THE ROLE OF NURSES IN MANAGEMENT OF THYPHOID IN WEST AFRICA**

**ABSTRACT**

This study was carried out on the role of nurses in management of thyphoid in west Africa; Onikokoro Community, Olorunda Local Government, Ibadan Oyo State as case study. The survey design was adopted and the simple random sampling techniques were employed in this study. The population size comprise of nurses in Onikokoro Community, Olorunda Local Government, Ibadan Oyo State. In determining the sample size, the researcher purposefully selected 113 respondents and 85 were validated. Self-constructed and validated questionnaire was used for data collection. The collected and validated questionnaires were analyzed using frequency tables, and mean scores. The result of the findings reveals that the prevalence of typhoid fever in Onikokoro Community is high. **The study also revealed that t**he nurses in Onikokoro Community has some knowledge about typhoid fever, its severity, causes, transmission mode and preventive measures. Furthermore, the study revealed that the risk factors and practices associated with typhoid fever in the community include; exposure to sun does not contribute to typhoid fever infection, lack of enough and reliable water sources contribute to typhoid fever, lack of neat/health toilet facilities contributes to typhoid fever, poor sanitation practices contribute to typhoid fever infections, and eating unwashed raw vegetables contribute to typhoid fever. Therefore, it is recommended that there is a need for the Onikokoro Community population to increase their knowledge of the risk factors and causes of typhoid fever. There is a need for the provision of basic amenities, for example, safe water and toilet facilities in the community. To mention but a few.

**CHAPTER ONE**

**INTRODUCTION**

**1.1 Background Of The Study**

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).

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). In the light of the above, this study aims at examining the knowledge and risk perception towards typhoid fever among Onikokoro Community, Olorunda Local Government, Ibadan Oyo State.

**1.2 Statement Of The Problem**

Typhoid fever is a bacterial disease transmitted by the fecal-oral route (Keddy et al., 2016; Shukla et al., 2014). The infection typically occurs from the ingestion or consumption of food or drinks infected with bacteria, usually transported by flies from the feces or urine of infected individuals (Keddy et al., 2016; Shukla et al., 2014). In Onikokoro Community, these flies transport disease to people’s homes, not only as a result of the poor conditions of the environment, but also due to the open defecation practiced by some of the villagers. The disease has been a significant public health issue in low and middle-income countries,

Furthermore, 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 the role of nurses in management of thyphoid in west Africa a case study of Onikokoro Community, Olorunda Local Government, Ibadan Oyo State.

**1.3 Objectives Of The Study**

The overall aim of this study is to critically assess the role of nurses in management of typhoid in west Africa. Hence, the study will be channeled to the following specific objectives;

1. Determine the prevalence of typhoid fever in Onikokoro Community.
2. Ascertain the knowledge of Onikokoro Community nurses towards typhoid fever.
3. Identify the risk factors and practices associated with typhoid fever.

**1.4 Research Question**

The study will be guided by the following questions;

1. What is the prevalence of typhoid fever in Onikokoro Community?
2. What is the knowledge of Onikokoro Community nurses towards typhoid fever?
3. What are the risk factors and practices associated with typhoid fever in the community?

**1.5 Significance Of The Study**

The significance of this study centers on the pursuit to fill a gap in the literature by promoting the awareness of typhoid fever and the specific risk factors among the villagers in Onikokoro Community. The findings from this study and understanding of these risk factors will not only contribute to the knowledge of appropriate hygienic practices associated with typhoid fever among the villagers but could also help researchers to facilitate positive social change within them. Findings from the individual views and perspective of the residents may provide opportunities for promoting positive social change with the goal of implementing the ideas for improving hygiene and sanitary conditions. The implication for social change include increased understanding of the perceptions of the disease, the perception of the effects of open defecation on the practice of eating and sleeping on the floor, and a policy decision for the provisions of toilet facilities and potable water in the community that will limit the effect of the disease within the population.

**1.6 Scope Of The Study**

This study is structured to generally assess knowledge and risk perception towards typhoid fever among Onikokoro Community, Olorunda Local Government, Ibadan Oyo State. However, the study will further determine the prevalence of typhoid fever in Onikokoro Community, ascertain the knowledge of Onikokoro Community nurses towards typhoid fever, and identify the risk factors and practices associated with typhoid fever. The respondents for this study will therefore be obtained from nurses in Onikokoro Community, Olorunda Local Government, Ibadan Oyo State.

**1.7 Limitation Of The Study**

In the course of carrying out this study, the researcher experienced some constraints, which included time constraints, financial constraints, language barriers, and the attitude of the respondents. However, the researcher were able to manage these just to ensure the success of this study.

**1.8 Definition Of Terms**

**Prevalence:** Is a measure of the frequency of existing disease at a given time.

**Typhoid fever:** This is a bacterial infection due to Salmonella typhi.

**CHAPTER TWO**

**REVIEW OF LITERATURE**

**INTRODUCTION**

Our focus in this chapter is to critically examine relevant literature that would assist in explaining the research problem and furthermore recognize the efforts of scholars who had previously contributed immensely to similar research. The chapter intends to deepen the understanding of the study and close the perceived gaps.

Precisely, the chapter will be considered in three sub-headings:

* Conceptual Framework
* Theoretical Framework

**2.1 CONCEPTUAL FRAMEWORK**

**Perception**

Perception is a significant concept used by researchers in their studies on a phenomenon of interest. Typically, the idea is to examine individual, or the population perception of the subject such as in the case of typhoid fever among Nimo villagers on influences or the contributing factors of the issue in question before intervention (Greenwell et al., 2013; Ritter et al., 2016; Pach et al., 2016). Some factors such as educational level, knowledge, and socioeconomic status may impact an individual’s perception related to maintaining or practicing appropriate hygienic practices related to a condition or a disease such as typhoid fever (Adams et al., 2014; Alba et al, 2016; Greenwell et al., 2013; Wain et al., 2015). According to WHO (2018), poor communities or lower socioeconomic status population are at highest risk of the disease. Researchers such as Alba et al. (2016); Greenwell et al. (2013); Pach et al. (2016) and Ritter et al. (2016) used perceptions as means of understanding how participants view or made sense of the issue in question around them. Alba et al. (2016) studied the impact of a household level and individual behavioral risk factors that showed knowledge or the perception of risk factors are significant in the prevention of typhoid fever which is needed to combat or control disease such as in the case of Nimo community. The study participants were individuals above 10 years of age in a health facility-based case-control study on a three Indonesian islands that constitutes a rural and urban population. Logistic regression was introduced to evaluate the impact of risk factors among the participants.

Alba et al.’s findings revealed that consistent hands washing with soap are robust independent protective factors for typhoid fever. In a similar qualitative study conducted by Greenwell et al. (2013), the researchers explored how individuals perceive the significance and the effect of hand washing to prevent typhoid fever. The study participants were from a semi-urban an informal squatter settlement near the capital city of Suva in the Island nation of Fiji; utilizing in-depth interviews and focus groups they explored to gain a comprehensive understanding of factors that influence habitual or consistency of hand washing as a control measure for typhoid fever. The researcher’s findings indicated that the perception of typhoid fever reveals confusion or misunderstanding of the related risk factors which constitutes a gap and noted that environmental barriers of hand washing associated with the accessibility of water and soap. Ritter et al. (2016) sought to understand the perceptions of dairy farmers from Alberta, Canada involved in Johne’s disease (JD) bacterial infection prevention and control program in relation to recommended practices and evaluate the contributing factors that influence the adoption of the measures that reduces the infection. They used a semistructured interview for the collection of data for 25 dairy farmers. The researchers discussed the importance of perceiving JD as a significant threat and for the farmers to believe in the control measures to be proactive or dedicated. Ritter et al. indicated that lack of proper perceptions about the disease and the prevention may be the main barriers for implementation of proposed control measures to the farmers.

Pach et al. (2016) also conducted a similar qualitative study that centers on the evaluation of participant’s experiences and perceptions of services for febrile symptoms associated with typhoid fever at rural and urban public health clinics in Madagascar a country in East Africa. The participants were 33 patients and 12 health care providers in two healthcare facilities. They used open-ended individual interviews and a focus group discussion for data collection. The researchers discussed the influences on the utilization of the facilities, source of care, medical consultations and the issues related to providing services. The study finding validated the significance of those health clinics in question as sites for the surveillance of typhoid fever in their role as a health care source for the community.

**Beliefs and Attitudes**

Researchers have used or considered the understanding of knowledge or beliefs and attitudes that influence a phenomena in question which may hinder a person from complying or in the pursuit of preventive behaviors before formulating or tailoring a culturally and adequate intervention to promote behavior change which is consistent with my study on typhoid fever among Nimo villagers (Burnham et al., 2014; Brennan et al., 2016; Fernandez, Rolley, Rajaratnam, Everett, & Davidson, 2015; Sadeq & Jabar, 2017). According to Sadeq and Jabar, (2017), increased health and disease awareness with improved attitude or behavior is needed to reduce the prevalence of typhoid fever. Utilizing a questionnaire as data collection instrument; in a cross-sectional quantitative study, Sadeq and Jabar evaluated the mothers’ knowledge, attitude and practice on typhoid fever at a pediatric hospital in Baghdad, Iraq. A Pearson correlation was introduced by the researchers to find out the relationship between age of mother, the number of children and their knowledge, attitude, and practice while chi-square was employed to point out the association between mothers’ educational level, knowledge, attitude, and practice. The study findings revealed that most mothers scored above average on knowledge, attitude and practice about typhoid infection but there were wrong beliefs about the disease concerning shaking hands, eating from street vendors, kissing from an infected person and carrier state. Brennan et al. (2016) explored the attitude and beliefs among dairy cattle farmers in Great Britain to determine the motivators and barriers for implementation cattle disease prevention and control measures such as biosecurity measures utilizing health psychology method. The researchers hypothesized that disease prevention and control measures are considered significant in ensuring the health and welfare of farmers, but there is limited knowledge on why not most of the practices are implemented. They interviewed 25 farmers in 24 different farms on their behavior concepts. Brennan et al. showed that farmers believed that they could control what happened in their farms as regards to preventing and controlling disease and explained benefits from being proactive and taking precautions. Burnham et al. (2014) explored the knowledge, attitudes, behaviors, and barriers to intervention among individuals with chronic liver disease (CLD) through focus group interview discussions. The study participants were 13 individuals who had a broad range of diagnosis or have experienced diseases severity that includes alcoholic liver disease and liver cancer. The researchers used HBM to evaluate these factors from the individuals. Burnham et al. revealed a lack of knowledge, negative attitude, and incorrect or wrong beliefs of CLD about the risks, causes, and the care or the intervention. Like Brennan et al. (2016); Burnham et al. (2014); Sadeq and Jabar (2017), Fernandez et al. (2015) supported that individual understanding of knowledge, beliefs and attitudes may encourage or hinder an individual from complying or pursuing preventive behaviors or concept such as typhoid fever the focus of my study. In their qualitative research, utilizing open-ended and focus group interview discussion, Fernandez et al. sought to gain a better understanding of the knowledge, attitudes, and beliefs on food practices that associates with reducing the risk factors of heart disease on the migrant population of Asian Indians. According to the study, while most of the participants viewed or understands the significance of dietary patterns positively in relation to reduction of risk factors of heart disease, challenges such as misconception in the knowledge and understanding of health and diet, stress and lack of employment, lack of family support, and community empowerment from not achieving their goals. There were some of the challenges that resulted in negative attitudes or other words not believing in prevention strategies to reduce heart disease. These researchers demonstrated how individual or communities attitudes, beliefs, and knowledge may influence the perception of different phenomena such as typhoid fever which relates to my study among Nimo Villagers (Brennan et al., 2016; Burnham et al., 2014; Fernandez et al., 2015; Sadeq & Jabar, 2017).

**Concept Of Typhoid**

Typhoid fever is a bacterial infection due to Salmonella typhi. Salmonella's genus is Gram-negative, motile, non-sporing, non-capsulate bacilli which exist in nature primarily as parasites of the intestinal tract of man and other animals. The species and strains of Salmonella that commonly cause typhoid fever in humans are Salmonella paratyphi A, Salmonella paratyphi B, Salmonella paratyphi C and Salmonella typhi (Lerner and Lerner, 2003). It is largely a disease of developing nations due to their poor sanitation and poor hygiene (Wain et al., 2015). It is spread by eating food or drinking water contaminated with faeces of an infected person (WHO, 2008). Transmission by flies such as Musca domestica has also been reported (Centre for Disease Control and Prevention, 2007). The most prominent feature of the infection is fever (Nnabuchi and Babalola, 2008). Globally, typhoid fever is an important cause of morbidity in many region of the world with an estimated 12 – 33 million cases leading to 216,000 – 600,000 deaths annually (Pang et al., 1995).

Typhoid fever is caused by the bacterium Salmonella Typhi usually through oralfecal route; it is more prevalent in developing or LMICs such as Africa that lack safe water, adequate sanitation, and proper hygiene practices (Imanishi et al., 2015; Pach et al., 2016; WHO, 2018). According to WHO (2018), better living conditions have reduced the typhoid fever morbidity and mortality in developed or industrialized countries. However, in Africa a developing continent, the disease continues to be a public health problem or concern (Polonsky et al., 2014; Jung-Seok Lee, MogasaleVijayalaxmi, Mogasale Vital, & Kangsung Lee, 2016; Keddy et al., 2016; Mogasale et al., 2016; WHO, 2018).

**Overview Of Typhoid Fever**

Typhoid fever poses a public health concern in less developed countries, particularly in Africa such as Nigeria a West African country. Researchers have pointed out lack of policies, unhygienic practices including inadequate environmental and sanitation infrastructure as the concerns (Jung-Seok Lee et al., 2016; Keddy et al., 2016; Mogasale et al., 2016; Polonsky et al., 2014; Shukla et al., 2014). Other issues that promote the infection in the area according to the researchers includes limited or gap in knowledge of the disease as regards to the related risk factors and the awareness of the disease in general which is consistent with Nimo community the focus of my study (Alba et al., 2016; Greenwell et al., 2013; Wain, Hendriksen, Mikoleit, Keddy, &Ochiai, 2015). These researchers have conducted studies on typhoid fever and the spread or contamination of the disease among populations to understand the increasing trends and evaluate the existing intervention and recommend typhoid fever-reducing interventions. Typically, in the world, annually, there are about 21 million incidents cases of typhoid fever and approximately 222,000 people die from the disease (WHO, 2018). According to WHO (2018), typhoid fever is an infection as a result of Salmonella typhi,usually from the contaminated food or water and the disease occurs in the areas where there are limited sanitation and lack of clean drinking water. The environmental transmission of the disease occurs due to exposure of fecal materials of infected people as a result of transportation by both humans and flies (Akullian et al., 2015; Dewan et al., 2013; Shukla et al., 2014). Enabuele and Awunor (2016) and Polonsky et al. (2014) pronounced the growing trends of typhoid fever problem particularly in developing countries as an epidemic. Globally, the increase in the disease is attributed to poor sanitation infrastructure or condition, level of education, personal or individual hygiene, and poor lifestyle or behavior (Dewan et al., 2013; Mogasale et al., 2016). Greenwell et al. (2013) and JungSeok et al. (2016) attributed the rapid rise of typhoid fever in those countries to urban slum and informal squatter settlements. Many qualitative and quantitative researchers sought to point out that African countries or the individuals in those areas have limited knowledge on the burden of typhoid fever risk factors and relate it to their behaviors, hygienic practices, and the prevention of the disease (Alba et al, 2016; Greenwell et al., 2013; Kalijee et al., 2017; Jung-Seok et al., 2016; Pach et al., 2016). However, there is a gap in the literature on how the perception of hygiene and experiences of Nimo villagers influence their living conditions and hygienic practices. I will explore the knowledge of the Nimo villagers concerning the risk factors of typhoid fever and the etiology. Phenomenology will be used to seek understanding and describe individual hygiene practices or lived experiences, identify needs and gaps, and recommend control or preventive measures to promote positive change in the community.

**Epidemiology And Clinical Features**

Salmonella typhi and the paratyphoid bacilli are found only in the intestinal tract of man for whom they have a high degree of pathogenicity and in which they frequently cause invasive disease that causes symptoms which may vary from mild to severe and usually begin six to thirty days after exposure with gradual onset of a high fever after several days (Okore Ubiaru Prince and Chigozirim2015). Weakness, abdominal pain, constipation, and headaches are the commonest symptoms. Some people develop a skin rash with rose colored spots. Without treatment, symptoms may last for weeks or months. Other people may carry the bacterium without symptoms; however, they are still able to spread the disease to others.

Typhoid fever is even less well understood in Africa than it is in Asia; largely due to poor resources for laboratory diagnostics and insuffiecient infrastructure to support epidemiological and clinical studies. These problems are manifestations of the challenges faced by a large, largely impoverished, continent with a high burden of HIV and unstable governments and with health-care priorities that overwhelm a country’s ability to provide safe food and potable water. In Africa, access to safe water should not be confused with access to piped water because water treatment plants age and resources are diminished (Nnabuchi and Babalola 2008). Attempts to define the burden of typhoid fever in Africa show very clearly a need for well designed studies.

Pradhan (2011) and colleagues attempted to calculate burden using published studies and concluded that information was too scarce to estimate anything better than a crude incidence rate—50 cases per 100 000 for a population of about 820 million. The 2010 Global Burden of Disease study2 estimated similar rates, but Buckle and colleagues1 increased these estimates—724·6 cases per 100 000—with the addition of rates from one publication from Kenya.47 The differences in estimates is driven by data from an area in which no interventions to control typhoid fever had been introduced. Earlier studies, as used by Pradhan (2011) and colleagues, assessed typhoid fever incidence rates after two large placebo-controlled trials for the typhoid vaccine. These trials involved more than 11 000 people in South Africa and more than 32 000 people in Egypt and so herd immunity (and hence decreasing incidence of typhoid fever in the controls) might have lowered disease rates.

**CAUSES OF TYPHOID**

According to Chwatt (1985) he observed that the causes of typhoid fever include:

1. Inadequate human waste treatment
2. Limited water supply especially in the urban areas
3. Over burdened health care system
4. Typhoid fever is also caused by s.typi bacteria.

**MODE OF TRANSMISSION**

On mode of transmission he said that the causative organism of typhoid fever has no host other than human being it can be transmitted through the following ways.

1. Through contact with acutely infected person or chronic carries.
2. Direct contact from person to person through facial oral route.
3. Through eating or drinking contaminated food or water.
4. Heath workers can contact, if after working on an infected person and through laboratory accident.
5. Through easting shellfish that have been contaminated by infected stools or urine.
6. Through the ingestion of food or drink contaminated by the faeces or urine of infected people.

**SYMPTOMS**

Bain (19940) was of the opinion that the symptoms of typhoid fever include;

1. Abdominal pain which is estimated to 20-40%
2. Fever up to 75% of patients has the following symptoms

Headache, Anorexia, cough, weakness, sore throat, Dizzines, muscle pains, Rash, Abdominal pain, malaise. Constipation or diarrhoea, rose-coloured sports on the chest and belly, Enlarge Spleen or liver, loss of appetite, Runny Nose, Nausea, Joint pains, Nose bleeds, Vomiting, vision changes e.t.c.

**SOURCES OF INFECTION**

According to chwatt (1985) typhoid fever is a common world wide illness, transmitted by the ingestion of food or water contaminated with the faces of an infected person, which contain the bacterium salmonella enterica. This bacteria perforate through the intestinal wall and are phagocytosed by macrophages. Chwatt (1985) also discover that the sources of infection of typical fever include;

­- Water that is contraindicated with feces

- Milk and daily product, inadequate pasteurization or improper handing and contamination with feces

- Shell fish-contaminated water

- Dried on frozen eggs; infected fowls on contamination during processing.

- Meats and products infected animals and contamination with feces by rondents and humans.

 - Recreational drugs; marijuana and others.

 - Animals, dyes; e.g caramines used in drugs, foods and cosmetics

- Household pest.

Chwatt (1988) was of the view that since the bacterial only survive in human host and are spread by contaminated food water in developing countries, sanitary measures must be take, infected meats, eggs, etc. must be through cooked. Carries must not be allowed to work as food handlers and should observe strict hypienic precautions. Injections of acetone; killed bacteria should be given and to occasionally for immunization and to prevent further spread of the disease. Also, human waste should be properly disposed and treated Refuse should be unlimited, water supply and treatment of contamination water should be treated before being supplied, individuals should learn personal hygiene by avoiding food that is not well prepared. The should also learn boiling heir drinking water and cook their food very well before taking them. Infected person should go to the hospital for adequate treatment. Health worker should be careful while working on infected persons, should avoid laboratory accidents by all means.

 Holmgren (2005) was of the view that typical fever is spread by; eating food or drinking liquids that have been handled by a carrier of the S. typhi bacteria who has not washed his/her hands properly after going to the toilet.

1. Using a toilet contaminated with bacteria and then touching your mouth before washing your hands.
2. Drinking water or eating shellfish that have been contaminated by infected stools or urine.

Holmgren stated that the causes of typhoid fever are as followings;

1. Ingestion of contaminated food or water
2. Contact with an acute case of typhoid fever.
3. Water is contaminated where there is inadequate sewerage system and poor sanitation.
4. Salmonella may directly infect the gall bladder through

 the hepaticduct or spread to other areas of the body through the blood stream.

1. Contact with a chromic asymptomatic carrier
2. By eating food or drinking beverages that have been handled by a person carrying the bacteria.

**Interventions /Prevention**

Jung-Seok Lee et al. (2016) and Polonsky et al. (2014) asserted that typhoid fever is a significant public health problem in developing countries and also discussed the potential interventions or solutions needed to control the disease. Prevention of typhoid fever requires improved or clean water and sanitation infrastructure, maintaining or encouraging proper individual and household hygiene, food safety practices, health education, community outreach awareness programs, and adequate medical service (Akullian et al., 2015; Alba et al., 2016; Dewan et al., 2013; Jung-Seok Lee et al., 2016; Kalijee et al, 2017; Kabwana et al., 2017; Lee et al., 2013; Thompson et al., 2014; Polonsky et al., 2014).

Lee et al. (2013) evaluated the incidence of typhoid fever, the related fatality rate, and the factors that decrease the incidence of the disease and deaths in Korea. They hypothesized and discussed the need for adequate availability of medical services and clean water including individual hygiene practices for the prevention of typhoid fever. Their study findings showed that availability or a proper amount of clean water was the primary and most significant factor that plays a role in the prevention of typhoid fever. Alba et al. (2016) evaluated the impact of a household level and individual behavioral risk factors associated with typhoid fever in three Indonesians islands of Sulawesi, Kalimantan, and Papua. Their theory was that knowledge of risk factors are needed to formulate or design effective or robust health education intervention strategies for the prevention of typhoid fever. The study findings showed that consistent or routine daily hands washing with soap are a strong protective factor of typhoid fever which reduces the incidence of the disease. Kabwama et al. (2017) investigated to determine the nature of the disease, method of transmission, and risk factors in Kampala, Uganda as a result of a large and constant outbreak of typhoid fever to formulate timely and effective intervention or control measures. Their result findings indicated that contaminated water and local or street vendor drinks were the source of the outbreak and among the interventions proposed centered on the provision of safe or clean water to the impacted areas including proper sanitation and hygiene facilities. Roy, Saikia, Medhi, and Tassa (2016) showed the importance of clean water supply and the associated sanitation standards or practices as the most significant factors in the prevention of typhoid fever outbreak or infection. Roy et al. conducted an epidemiological investigation in Jorhat Town in Assam, India to determine the etiology and source of typhoid fever outbreak in the area. Inconsistent with typhoid fever preventive measures discussed above, Roy et al. revealed the role reinforced the significance of water quality and the contamination with fecal materials that associates with the infection of typhoid fever. Multiple researchers demonstrated the importance of understanding or having knowledge of the causes or the factors that promote disease such as typhoid fever before addressing or introducing preventive measures which are not only consistent but can also apply to my study.

**Treatment**

Recent reviews of diagnosis and treatment of typhoid fever3,4 make it clear that the laboratory diagnosis of typhoid fever is largely dependent on the detection of organisms in blood by PCR (best suited to epidemiological surveys) or culture (although sensitivity remains a limitation).4–6 The Widal test for antibody production is unreliable and new-generation serology tests such as typhidot and tubex have not proved reliable in Africa7–9 or Asia.10,11 One new test format that shows promise is the typhoid–paratyphoid diagnostic assay,12 which detects IgA. This method has specificity of detection of circulating IgA for the diagnosis of typhoid fever with use of ELISA11 and improves the sensitivity (to 100%) through amplification of the signal by isolation and incubation of peripheral blood lymphocytes

 Treatment with ﬂ uoroquinolones, azithromycin, and third-generation cephalosporin drugs is the main treatment, with chloramphenicol used in regions in which susceptible strains are present.

In 1970, the use of plaused medicaled resistance was introduced because of the increased mortality rate associated with the former treatment and this is a non-antibiotic drug. Later, antibiotic drug which is ampicillic (induced to bone marrow toxity) being prescribed at 1lg orally every 6 hours trimethoprim-sul-fane thozagole (tmp-Smz) is also being prescribed at one table twice a day. In 1994, cephalosporios were recommended for empirical antibiotic treatment of susceptible strains and is being prescribed at 1-2g one or twice a day for ten days. A 5-7 day therapy is sufficient for uncomplicated cases. Quinotones is antibiotics for multi-drug resistant infection mainly for styphi infections.

**2.2 THEORETICAL FRAMEWORK**

A theoretical framework includes concepts and, accompanied by their definitions and reference to pertinent scholarly literature, existing theories used for a particular study. This demonstrates an understanding of theories and concepts that are relevant to the topic of a research paper and that relate to the broader areas of knowledge being considered (Labaree, 2009). Research conducted around the use of technology in banking has employed the application of several research models and theories to explain factors that lead to adoption of technology. The theoretical base for this study was health belief model (HBM) and ecological model (EM). The HBM was introduced by social psychologists (Hochbaum, 1958; Rosentock, 1960) in the United States public health service to explain the failure of people involved in programs that prevent disease (Glanz, Rimer, &Viswanth, 2015). In the EM, the focus centers on the association between organisms and environments (Glanz al., 2015). According to Adams, Hall, and Fulghum (2014), HBM postulates that changes in behavior are derived from changes in knowledge and beliefs. Glanz et al. (2015) reported that the perception of HBM is that an individual’s willingness to change his or her behaviors depends on perceived susceptibility to infection, the severity of the risk, perceived barriers to change, perceived benefits of change, self-efficacy, and cues to action. In other words, people tend to change their behavior with a belief about the positive effects of the intervention (Glanz et al., 2015). The model supports the idea of research and aligns with the research question because the focus of the study is on behavior change which exemplifies this concept. In the EM numerous levels of influence exist, but they are interactive, supportive, and thus individuals interact with their physical and sociocultural environments (Glanz et al., 2015; Moore, Sanigorski, & Moore, 2013). According to Akullian et al. (2015), the inadequacy of environmental conditions is among the causes of typhoid fever. However, EM posits that achieving a sustainable optimal behavior change or health improvement is more effective when addressing the factors that include environmental conditions (Glanz et al., 2015). The belief is that education on healthy choices is necessary when the conditions are not adequate. Sanitary and hygienic conditions that are the focal points of this study tend to produce weak and short-term effects on behaviors that include self-efficacy (Glanz et al., 2015). Finally, the cues to action center on the internal or external factors of a population that triggers health behavior and calls for using or promoting awareness as an intervention strategy (Glanz et al., 2015). HBM can be used to guide this study for stimulating knowledge of behavior change to prevent the infection and the consequences of the disease as a result of inadequate hygienic and sanitary practices and the EM is introduced to develop a full understanding of the factors that influence these behaviors and the need for behavior change.



Figure 1. HBM of typhoid fever and prevention.



Figure 2. Ecological model of typhoid fever infection and prevention.

**Theoretical Application of the Health Belief Model**

The HBM has been applied by many researchers to evaluate health behavior interventions in relation to disease prevention and to understand how the perceptions of benefits, threats, cues to action, and self-efficacy play a role in individuals becoming involved in safety practices (Adams et al., 2014; Bishop et al., 2015; Dardis et al., 2015; Romano & Scott, 2014). Behavior change and perception or understanding of the factors that associate with the disease do significantly impact the knowledge and beliefs (Adams et al., 2014; Alba et al., 2016). Adams et al. (2014), utilizing HBM, evaluated the effects of attitudes and beliefs of clients on hemodialysis concerning influenza, pneumococcal pneumonia, and hepatitis B virus vaccine. Their findings revealed that age, perceived susceptibility, and perceived severity increases the possibility of having some vaccines. Romano and Scott (2014) employed the HBM to assess the reduction of obesity within African American and Hispanic community. The focus centered on prevention of reducing cardiovascular disease including the impact of programs related to developing a healthy lifestyle behaviors change that affects an individual’s health (Romano &Scott, 2014). The target populations were men and women that are between 18 and 80 years of age. The study findings indicated that HBM could be integrated into a preventive health program to ensure compliance and the success of the individuals in question. The HBM was used to design educational strategies to improve pertussis vaccination rates on the preschool staff by Dardis et al. (2015). The pilot study involved 25 adults, female preschool employees and goal was to evaluate if school nurses are instrumental or assist in improving staff immunization rates for pertussis by employing HBM as a framework. Dardis et al. concluded with their findings that education increases vaccination uptake and therefore with educational intervention the health of the individuals and the population will improve. The HBM was also previously applied in the evaluation of individual’s involvement in safety practices at hospitals by Bishop et al. (2015). The goal was to find out if the patient’s perceptions of safety relate to the involvement in the challenges of safety practices and if HBM is instrumental in explaining the perceptions. Bishop et al. not only reiterated that HBM produces a model to clarify measure and project population’s health behavior in association to the involvement of safety, but also concluded that the introduction of HBM increases knowledge of those perceptions in question. I utilized the application of the HBM on the above studies in a similar process with this study. The goal was to introduce or apply this model as a theoretical lens to evaluate the effectiveness or the knowledge of the related factors and interventions measures from the perspectives of Nimo villagers concerning the infection of typhoid fever.

**Justification for Choosing Health Belief Model**

The HBM was chosen among other theories such as the Transtheoretical Model of Change (TTM) to guide intervention within Nimo Villagers regarding the infection of typhoid fever. HBM was considered more efficient and adequate because of the effects of the constructs that focused on the perceived susceptibility, perceived severity, perceived benefits, and perceived barriers to the disease. In the case of TTM, even though, the primary construct according to Liau et al. (2013) centers on the stages of change that involves five steps such as precontemplation, contemplation, preparation, maintenance, and action which can be useful in the behavior change regarding adhering to the concepts of hand washing that is among the risk factors of the disease. However, TTM might not be considered in this case due to the classification of behavior change into five distinct stages instead of a continuous process (Nigg et al., 2011). The constructs are deficient in revealing the sequence of events or causality and does not indicate if stage change associates with behavior change (Nigg et al., 2011). HBM posits that the higher individuals or population perceived a threat of illness, the higher the chance that the person in question will take on a targeted health action to reduce the disease or infection which is consistent with my study on Nimo villagers (Adams et al., 2014).

**2.3 EMPIRICAL REVIEW**

According to Antillon et al. (2017), about 17.8 million cases of typhoid fever exist each year in LMICs. With research studies in Africa focusing on sanitation, standards of hygiene, and environmental factors that promote the disease, there is a limited literature on the environmental behavior and living conditions in relation to the knowledge of the risk factors that contribute to the disease in rural areas such as Nimo community (Alba et al., 2016; Akullian et al., 2015; Dewan, Corner, Hashizume, & Ongee, 2013; Jung-Seok Lee et al., 2016; Shukla et al., 2014). The insufficient literature on these risk factors and the lack of awareness about them tend to increase the burden of the disease within the population and created a gap that this study will strive to bridge. The result of my study may initiate questions from researchers that may produce hypotheses for future studies. Multiple studies have been conducted to pinpoint proper and robust measures to control typhoid fever. Through the years, researchers such as Akullian et al. (2015), Dewan et al. (2013), Huttinger et al. (2017), Jung-Seok Lee et al. (2016), and Shukla et al. (2014) have conducted studies that address the effect of inadequate hygienic practices, fecal materials due to environmental factors in relation to transmission and the health implications. Akullian et al.’s focus was on environmental factors targeting areas of high geographic risk, particularly in low elevation areas where fecal waste materials have the highest accumulate or concentrate exposing children to a greater risk of typhoid fever infection. Shukla et al. revealed that habitat characteristics that involve plant and vegetation in neighborhoods, open drainage, garbage dumps, water storage tanks, and ponds produce a healthy environment for the growth of flies. These flies transport disease not only as a result of the deplorable conditions of the environment but also due to the open defecation practice which is consistent with most of Nimo villagers (Shukla et al., 2014; WHO, 2018). Researchers such as Greenwell et al. (2013) and Mogasale et al. (2016) focused on the sanitation and hygiene infrastructure which relates to informal squatter settlements.

The literature review on typhoid fever revealed that poverty plays a significant role in maintaining sanitation. There is an exodus from rural area informal squatter settlements in urban settings where there is limited access to water and sewerage infrastructure. Typhoid fever, being food and waterborne disease, is associated with poor hygiene as well as over populated areas where there is lack of proper sanitation (Greenwell et al., 2013; Kanj et al., 2015). There is no adequate maintenance of septic tanks and waste storage facilities in rural villages, and the combination of poor sanitation and saturated soil creates unsanitary environment because of the tendency of contamination of surface and groundwater (Greenwell et al., 2013; Mogasale et al. 2016; Thompson et al., 2014). The literature review also pointed out necessary intervention measures that have been suggested or utilized to control typhoid fever. Some of these measures includes adequate availability of medical services, clean water, vaccination, proper hand hygiene that includes hand washing, and the provision of basic sanitation facilities (Huttinger et al., 2017; Kanj et al, 2015; Lee, Lee, Park, & Kim, 2013; Thompson et al., 2014). Despite the introduction of these measures, typhoid fever continues to be a health issue according to the literature reviewed. Having Nimo residents to share their perceptions and lived experiences concerning typhoid fever may not only trigger questions or hypothesis from researchers for future research but can open avenue in combating the disease in relation with the knowledge of risk factors.

**CHAPTER THREE**

**RESEARCH METHODOLOGY**

**3.1 Introduction**

In this chapter, we described the research procedure for this study. A research methodology is a research process adopted or employed to systematically and scientifically present the results of a study to the research audience viz. a vis, the study beneficiaries.

**3.1 Research Design**

Research designs are perceived to be an overall strategy adopted by the researcher whereby different components of the study are integrated in a logical manner to effectively address a research problem. In this study, the researcher employed the survey research design. This is due to the nature of the study whereby the opinion and views of people are sampled. According to Singleton & Straits, (2009), Survey research can use quantitative research strategies (e.g., using questionnaires with numerically rated items), qualitative research strategies (e.g., using open-ended questions), or both strategies (i.e. mixed methods). As it is often used to describe and explore human behaviour, surveys are therefore frequently used in social and psychological research.

**3.2 Population of the Study**

According to Udoyen (2019), a study population is a group of elements or individuals, as the case may be, who share similar characteristics. These similar features can include location, gender, age, sex or specific interest. The emphasis on study population is that it constitutes individuals or elements that are homogeneous in description.

This study was carried out on the role of nurses in management of thyphoid in west africa among nurses in Onikokoro Community, Olorunda Local Government, Ibadan Oyo State. Hence, the population of this study comprises of nurses in Onikokoro Community, Olorunda Local Government, Ibadan Oyo State.

**3.3 Sample Size Determination**

A study sample is simply a systematic selected part of a population that infers its result on the population. In essence, it is that part of a whole that represents the whole and its members share characteristics in like similitude (Udoyen, 2019). In this study, the researcher adopted the convenient sampling method to determine the sample size.

**3.4 Sample Size Selection Technique and Procedure**

A study sample is simply a systematic selected part of a population that infers its result on the population. In essence, it is that part of a whole that represents the whole and its members share characteristics like similitude (Udoyen, 2019). In this study, the researchers adopted the simple random sampling (srs.) method to determine the sample size.

In this study, the researcher adopted a convenient sampling method to determine the sample size. Out of the entire population of nurses in Onikokoro Community, Olorunda Local Government, Ibadan Oyo State, the researcher conveniently selected 113 participants as the sample size for this study. According to Torty (2021), a sample of convenience is the terminology used to describe a sample in which elements have been selected from the target population on the basis of their accessibility or convenience to the researcher.

**3.5 Research Instrument and Administration**

The research instrument used in this study is the questionnaire. A survey containing series of questions were administered to the enrolled participants. The questionnaire was divided into two sections, the first section enquired about the responses demographic or personal data while the second sections were in line with the study objectives, aimed at providing answers to the research questions. Participants were required to respond by placing a tick at the appropriate column. The questionnaire was personally administered by the researcher.

**3.6 Method of Data Collection**

Two methods of data collection which are primary source and secondary source were used to collect data. The primary sources was the use of questionnaires, while the secondary sources include textbooks, internet, journals, published and unpublished articles and government publications.

**3.7 Method of Data Analysis**

The responses were analyzed using frequency tables, and mean and standard deviation, which provided answers to the research questions.

In using the mean score, the four points rating scale will be given values as follows:

SA = Strongly Agree 4

A = Agree 3

D = Disagree 2

SD = Strongly Disagree 1

**Decision Rule:**

To ascertain the decision rule; this formula was used

|  |
| --- |
| 4+3+2+1 =10**= 2.5** 4 4 |

Any score that was 2.5 and above was accepted, while any score that was below 2.5 was rejected. Therefore, 2.5 was the cut-off mean score for decision taken.

**3.8 Validity of the Study**

Validity referred here is the degree or extent to which an instrument actually measures what is intended to measure. An instrument is valid to the extent that is tailored to achieve the research objectives. The researcher constructed the questionnaire for the study and submitted to the project supervisor who used his intellectual knowledge to critically, analytically and logically examine the instruments relevance of the contents and statements and then made the instrument valid for the study.

**3.9 Reliability of the Study**

The reliability of the research instrument was determined. The Pearson Correlation Coefficient was used to determine the reliability of the instrument. A co-efficient value of 0.68 indicated that the research instrument was relatively reliable. According to (Taber, 2017) the range of a reasonable reliability is between 0.67 and 0.87.

**3.10 Ethical Consideration**

The study was approved by the Project Committee of the Department. Informed consent was obtained from all study participants before they were enrolled in the study. Permission was sought from the relevant authorities to carry out the study. Date to visit the place of study for questionnaire distribution was put in place in advance.

**CHAPTER FOUR**

**DATA PRESENTATION AND ANALYSIS**

1. **1 Introduction**

This chapter presents the analysis of data derived through the questionnaire and key informant interview administered on the respondents in the study area. The analysis and interpretation were derived from the findings of the study. The data analysis depicts the simple frequency and percentage of the respondents as well as interpretation of the information gathered. A total of one hundred and thirteen(113) questionnaires were administered to respondents of which 95 were returned, while 85 were validated. This was due to irregular, incomplete and inappropriate responses to some questionnaire. For this study a total of 85 was validated for the analysis.

**4.2 Data Presentation**

The table below shows the summary of the survey. A sample of 113 was calculated for this study. A total of 95 responses were received and 85 were validated. For this study a total of 85 was used for the analysis.

**Table 4.1: Distribution of Questionnaire**

|  |  |  |
| --- | --- | --- |
| **Questionnaire**  | **Frequency** | **Percentage**  |
| Sample size | 113 | 100 |
| Received  | 95 | 84.01 |
| Validated | 85 | 75.22 |

**Source: Field Survey, 2022**

**Table 4.2: Demographic data of respondents**

|  |  |  |
| --- | --- | --- |
| **Demographic information** | **Frequency** | **percent** |
| **Gender** |  |  |
| Male | 50 | 59% |
| Female | 35 | 41% |
| **Age** |  |  |
| 20-30 | 10 | 12% |
| 31-40 | 17 | 20% |
| 41-50 | 42 | 49% |
| 51+ | 16 | 19% |
| **Education** |  |  |
| Dropout | 16 | 19% |
| Basic Education | 21 | 25% |
| Secondary Education | 33 | 39% |
| Tertiary Education | 15 | 17% |
| **Marital Status** |  |  |
| Single | 16 | 19% |
| Married | 49 | 58% |
| Divorced | 11 | 13% |
| Widowed | 09 | 10% |
| **Occupation** |  |  |
| Student | 17 | 20% |
| Self-employed | 29 | 34% |
| Employed | 24 | 28% |
| Unemployed | 15 | 18% |

**Source: Field Survey, 2022**

**4.3 ANSWERING RESEARCH QUESTIONS**

**Question 1:** What is the prevalence of typhoid fever in Onikokoro Community?

**Table 4.3:** The prevalence of typhoid fever in Onikokoro Community is high.

|  |  |  |
| --- | --- | --- |
| **Options** | **Frequency** | **Percentages** |
| Strongly Agreed | 27 | 32 |
| Agreed | 35 | 41 |
| Strongly Disagreed | 13 | 15 |
| Disagreed | 10 | 12 |
| **Total** | **85** | **100** |

 **Source: Field Survey, 2022**

From table 4.3 above, 32% of the respondents strongly agreed, followed by 41% of the respondents agreed, and 15% of the respondents strongly disagreed, while the remaining 12% of the respondents disagreed.

**Question 2:** What is the knowledge of Onikokoro Community nurses towards typhoid fever?

**Table 4.4:** Mean Responses on the knowledge of Onikokoro Community nurses towards typhoid fever.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEM STATEMENT** | **SA****4** | **A 3** | **D 2** | **SD 1** | **X** | **S.D** | **DECISION** |
| 1 | Typhoid fever caused by germs | 30 | 44 | 11 | 0 | 3.2 | 5.23 | Accepted |
| 2 | Typhoid fever transmitted by drinking contaminated water | 40 | 35 | 05 | 05 | 3.29 | 5.29 | Accepted |
| 3 | Typhoid fever transmitted by Eating contaminated food | 41 | 35 | 09 | 0 | 3.38 | 5.36 | Accepted |
| 4 | Loss of appetite symptoms of typhoid fever infection | 41 | 32 | 07 | 05 | 3.28 | 5.28 | Accepted |
| 5 | Fever and head ache are symptoms of typhoid fever | 36 | 30 | 10 | 09 | 3.09 | 5.13 | Accepted |
| 6 | Proper disposal of waste prevents typhoid fever infection | 39 | 37 | 09 | 0 | 3.35 | 5.34 | Accepted |
| 7 | Hand washing prevent typhoid fever infection | 42 | 36 | 07 | 0 | 3.41 | 5.39 | Accepted |
| 8 | Drinking boiled water prevent typhoid fever infection. | 39 | 29 | 10 | 07 | 3.18 | 5.2 | Accepted |

**Source: Field Survey, 2022**

In table 4.5 above, on the knowledge of Onikokoro Community nurses towards typhoid fever, the table shows that all the items (item1-item8) are accepted. This is proven as the respective items (item1-item8) have mean scores above 2.50. This depicts the knowledge of Onikokoro Community nurses towards typhoid fever.

**Question 3:** What are the risk factors and practices associated with typhoid fever in the community?

**Table 4.5:** Mean Responses on the risk factors and practices associated with typhoid fever in the community.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEM STATEMENT** | **SA****4** | **A 3** | **D 2** | **SD 1** | **X** | **S.D** | **DECISION** |
| 1 | Exposure to sun does not contribute to typhoid fever infection | 27 | 40 | 12 | 06 | 3.04 | 5.08 | Accepted |
| 2 | Lack of enough and reliable water sources contribute to typhoid fever | 43 | 34 | 08 | 0 | 3.4 | 5.39 | Accepted |
| 3 | Lack of neat/health toilet facilities contributes to typhoid fever | 35 | 28 | 09 | 13 | 3.0 | 5.05 | Accepted |
| 4 | Poor sanitation practices contribute to typhoid fever infections | 40 | 38 | 07 | 0 | 3.39 | 5.37 | Accepted |
| 5 | Eating unwashed raw vegetables contribute to typhoid fever | 37 | 35 | 06 | 07 | 3.2 | 5.22 | Accepted |

**Source: Field Survey, 2022**

In table 4.5 above, on the risk factors and practices associated with typhoid fever in the community, the table shows that all the items (item1-item5) are accepted. This is proven as the respective items (item1-item5) have mean scores above 2.50. This depicts that the above are the risk factors and practices associated with typhoid fever in the community.

**CHAPTER FIVE**

**SUMMARY, CONCLUSION AND RECOMMENDATION**

**5.1 Summary**

In this study, our focus was on the role of nurses in management of thyphoid in west Africa. The study is was specifically carried out to determine the prevalence of typhoid fever in Onikokoro Community, ascertain the knowledge of Onikokoro Community nurses towards typhoid fever, and identify the risk factors and practices associated with typhoid fever.

The study adopted the survey research design and randomly enrolled participants in the study. A total of 85 responses were validated from the enrolled participants where all respondent were nurses in Onikokoro Community, Olorunda Local Government, Ibadan Oyo State.

**5.2 Conclusion**

Based on the findings of this study, the researcher concluded that;

1. The prevalence of typhoid fever in Onikokoro Community is high.
2. The nurses in Onikokoro Community has some knowledge about typhoid fever, its severity, causes, transmission mode and preventive measures.
3. The risk factors and practices associated with typhoid fever in the community include; exposure to sun does not contribute to typhoid fever infection, lack of enough and reliable water sources contribute to typhoid fever, lack of neat/health toilet facilities contributes to typhoid fever, poor sanitation practices contribute to typhoid fever infections, and eating unwashed raw vegetables contribute to typhoid fever.

**5.3 Recommendation**

With respect to the findings and the aim of this study, the researchers therefore recommend that;

1. There is a need for the Onikokoro Community population to increase their knowledge of the risk factors and causes of typhoid fever. There is a need for the provision of basic amenities, for example, safe water and toilet facilities in the community.
2. 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. 
3. Health institution of the area should include health education program. 
4. The municipal office of the town should work on the waste disposal system.

**Reference**

Adams, A., Hall, M., & Fulghum, J. (2014). Utilizing the health belief model to assess vaccine acceptance of patients on hemodialysis. Nephrology Nursing Journal: Journal of The American Nephrology Nurses' Association, 41(4), 393-406. Retrieved from http:// www.ncbi.nlm.nih.gov/pubmed/25244894

Akullian, A., Ng’eno, E., Matheson, A., Cosmas, L., Macharia, D., & Fields, B. (2015). Environmental transmission of typhoid fever in an Urban Slum. Plos Neglected Tropical, 9(12), 1-14. doi:1.1371/journal.pntd.0004212

Alba, S, Bakker, M, I., Hatta, M., Scheelbeek, P, F, D., Dwiyant, R., & Usman, R. (2016). Risk factors of typhoid infection in the Indonesian Archipelago. Plos One, 11(6), e0155286. doi:10.1371/journal.pone.0155286

Anambra State Government. (2017). Anambra state government-Light of the nation: Urbanization and structure planning. Retrieved from http://www.anambrastate.gov.ng/urbanization-and-regional-planning

Anambra State Government. (2017). Anambra state government-Light of the nation: History of Anambra. Retrieved from http://www.anambrastate.gov.ng/history

Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. Journal of Emerging Trends in Educational Research and Policy Studies, 5(2), 272-281. Retrieved from http://jeteraps.scholarlinkreserach.com/

Antillón, M., Warren, J. L., Crawford, F. W., Weinberger, D. M., Kürüm, E., & Pak, G. D. (2017). The burden of typhoid fever in low- and middle-income countries: A meta-regression approach. Plos Neglected Tropical Diseases, 11(2), e0005376. doi:10.1371/journal.pntd.0005376

Babbie, E. (2017). Basics of social research (7th ed.). Boston, MA: Cengage Learning. Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods (4th ed.). Thousand Oaks, CA: Sage.

Bara HT. et al. “Knowledge Attitudes and Practices Related to Typhoid” (2016).

Bishop, A.C., Baker, G. R., Boyle, T. A., & MacKinnon, N. J. (2015). Using the health belief model to explain patient involvement in patient safety. Health Expectations: An International Journal of Public Participation in Health Care and Health Policy, 18(6), 3019-3033. doi:10.1111/hex.12286

Brown, B., Galea, J. T., Dube, K., Davidson, P., Khoshnood, K., Holtzman, L.(2018). The need to track payment incentives to participate in HIV research. IRB: Ethics & Human Research, 40(4), 8-12. Retrieved from https://ezp.waldenulibrary.org/login?url=https:search.ebscohost.com/login.aspx?d irect=true&db=mnh&AN=30387975&site=eds-live&scope=site

Burnham., B., Wallington, S., Jillson, L. A., Trandafill, H., Shetty.,K., &Wanh, J.(2014). Knowledge, attitudes, and beliefs of patients with chronic liver disease. American Journal of Health Behavior, 38(5), 737-744.doi: 10.5993/AJHB.38.5.1

Chang, Yi-Ya., Dai, Yu-Tzu., Chien, Nai-Hui., & Chan, Hui-Ya. (2016). The lived experiences of people with chronic obstructive pulmonary disease: A phenomenological study. Journal of Nursing Scholarship, 48(5), 466-471. doi:/10.1111/jnu.12230

Dardis, M. R., Koharchik, L.S., & Dukes, S. (2015). Using the health belief model to develop educational strategies to improve pertussis vaccination rates among preschool staff. NASN School Nurse, 30(1), 20-25. doi:10.1177/1942602X14549256

Dewan, A. M., Corner, R., Hashizume, M., & Ongee, E. T. (2013). Typhoid fever and its association with environmental factors in the Dhaka Metropolitan Area of Bangladesh: a spatial and time-series approach. Plos Neglected Tropical Typhoid Diseases, 7(1), 1-14. doi:10.1371/journal.pntd.0001998

Enabuele, O., & Awnor, S. N. (2016). Typhoid fever in tertiary hospital in Nigeria: Another look at the widal agglutination test as a preferred option for diagnosis. Nigerian Medical Journal, 57, 145-149. doi:10.4103/0300-1652.184057

Ethel Osei-Tutu. A Study on Typhoid Fever in Elmina in the Central Region of Ghana 2011” (2011).

Fauci A.S., Kasper D.L, Longo D.L., Braunwald, Hauser, Jameson, Loscalzo. (2008)

Fernandez, R., Rolley, J. X., Rajaratnam, R., Everett, B., & Davidson, M. (2015). Reducing the risk of heart disease among Indian Australians: Knowledge, attitudes, and beliefs regarding food practices- a focus group study. Food & Nutrition Research, 59(0), 1-7. doi:10.3402/fnr.v59.25770

Fihour, L. D. (2017). The lived experiences of suffering of males after blunt trauma: A Phenomenological study. Journal of Trauma Nursing, 24(3), 193-202. doi:10.1097/JTN.00000000000289

Gargari, A. S., Hosseini, F. S., & Ahmadi, M. (2018). Effect of an intervention based on socio-ecological model in promoting physical activity of female employees. Journal of Research & Health, 8(2)163-172. doi:10.29252/jrh.8.2163

Gredelj, I. (2015). Unplanned settlements, Prostor, 23(2), 324-331. Retrieved from https://ezp.waldenulibrary.org/login?url=https:search.ebscohost.com/login.aspx?d irect=true&db=a9hAN=113064308&site=eds-live&scope=site

Greenwell, J., McCool, J., Kool, J., & Salusalu, M. (2013). Typhoid fever: Hurdles to adequate hand washing for disease prevention among the population of a periurban informal settlement in Fiji. Wpsar, 4(1), 1-5. doi:10.5365/wpsar.2012.3.4.006 10.1177/1525822X05279903

Halcomb, E. J., & Davidson, P. M. (2006). Is verbatim transcription of the interview data always necessary?

Harrison's Principles of Internal Medicine, 17th ed.

Hassan, P., Izadi- Avanji, FS., Rakhshan, M., &Alavi Majid H. (2017). A Phenomenological study on resilience of the elderly suffering from chronic disease: a qualitative study. Psychology Research and Behavior Management 10(2017), 59-67. doi:10.2147/PRBM.S121336

Hosoglu S, Bosnak V, Akalin S, Geyik M F, Ayaz C. (2008) Evaluation of false negativity of the Widal test among culture proven typhoid fever cases. J Infect Developing Countries: 2(6): 475-478.

Huttinger, A., Dreibebis, R., Kayigamba, F., Ngabo, F., Mfura, L., &Merrywearher, B. (2017). Water, sanitation and hygiene infrastructure and quality in rural healthcare facilities in Rwanda. BMC Health Services Research, 17(1), 1- 11.doi:10.1186/s12913-017-2460-4

Imanishi, M., Newton, A.E.,Viera, A. R., Gonzalez-Aviles, G., Scoot, M.E. K., & Manikonda, K. (2015). Typhoid fever acquired in the United States, 1999-2010: epidemiology, microbiology, and use of space-time scan statistic for outbreak detection. Epidemiolgy and Infection, 143(11), 2343-2354. doi:10.1017/S0950268814003021

Jacob, S. A., &Furgerson, S. P. (2012). Writing interview protocols and conducting interviews: Tips for students new to the field of qualitative research. The Qualitative Report, 17(42). 1-10. Retrieved from http://www.nova.edu/ssss/QR/QR17/jacob.pdf

Jinruang, S., Phuphaibul, R., Jiawiwatkul, U., &Panitrat, R. (2017). A Phenomenological study of health-risk behaviors among Thai adolescents who drop-out from school. Pacific Rim International Journal of Nursing Research, 21(3), 195-205. Retrieved from https://tci-thaijo.org/index.php/PRIJNR/article/view/62868

JO O., et al. “Prevalence of Salmonellosis among Food Handlers and the Health Implications on the Food Consumers in Lagos State Nigeria”. Journal of Medical Microbiology and Diagnosis 4.2 (2015): 187.

John A, Luby Stephen P., Mintz Eric D. (2004). The global burden of typhoid fever. Bull World Health Organ: 82(5): 346-353.

Jung-Seok, L., Mogasale, V. V., Mogasale, V., & Kangsung, L. (2016). Geographical distribution of typhoid risk factors in low and middle income countries. BMC Infectious Diseases, 16, 1-10. doi:10.1186/s12879-016-2074-1

Kabwama, S. N., Bulage, L., Nsubuga, F., Pande, G., Oguttu, D. W., &Mafiggiri, R. (2017). A large and persistent outbreak of typhoid fever caused by consuming contaminated water and street-vended beverages: Kampala, Uganda, January-June 2015. BMC Public Health, 17(23), 1-9. doi 10.1186/s12889-016-40020.

Kaljee, L. M., Pach, A., Garrett, D., Bajracharya, D., Karki, K., & Khan, I. (2017). Social and economic burden associated with typhoid fever in Kathmandu and surrounding areas: A qualitative study. Journal of Infectious Diseases, doi:10.1093/infdis/jix122

Kanj, S. S., Kanafani, Z. A., Shehab, M., Sidani, N., Baban, T., &Baltajian, K. (2015). Epidemiology, clinical manifestations, and molecular typing of salmonella typhi isolated from patients with typhoid fever in Lebanon.

Keddy, K. H., Sooka, A., Smith, A. M., Musekiwa, A., Nomsa, P. T., Klugmsn, K.P., & Augulo, F. J. (2016). Typhoid fever in South Africa in an endemic HIV setting. Plos One, 11(10), 1-12. doi:10. 1371/jurnal.pone.0164939

Khanyelele Makhanu E. “Impact of Cultural Factors on the Management of Typhoid Fever in Bungoma County Kenya”. International Journal of Academic Research in Business and Social Sciences 4.5 (2014): 491- 499.

Kinuthia, G. K., Gicheru, M. M., Ngure, P. K., &Ksbiru, E. W., (2012). Lifestyles and practices that enhance malaria and typhoid fever in Nojo District, Kenya. Journal of Community Health, 37: 224-235. doi:10.1007/s10900-1011-9440-0

Lamothe, J., &Guay, S. (2017). Workplace violence and the meaning of work in healthcare workers: A Phenomenological study. Work, 56(2), 185-197. doi: 10.3233/WOR-172486

LaPelle, N. R. (2004). Simplifying qualitative data analysis using general purpose software tools. Preventive and Behavioral Medicine, 16(1), 1–20. doi: 10.1177/1525822X03259227

Lee, D.-Y., Lee, E., Park, H., & Kim, S. (2013). Availability of clean tap water and medical services prevents the incidence of typhoid fever. Osong Public Health and Research Perspectives, 4(2), 68-71. doi:10.1016/j.phrp.2013.03.005

Leung, L. (2015). Validity, reliability, and generalizability in qualitative research. Journal ofFamily Medicine and Primary Care, 4(3), 324-327. doi:10.4103/2249- 4863.161306

Liau, S. Y., Shafie, A. A., Ibrahim, M. M., Hassali, M. A., Othman, A. T., Mohamed, M. N., & Hamdi, M. A. (2013). Stages of change and health-related quality of life among employees of an institution. Health Expectations.

Malisa A and Nyaki H. “Prevalence and constraints of typhoid fever and its control in an endemic area of Singida region in Tanzania”. Journal of Public Health and Epidemiology 2.5 (2010): 93-99. implications.

Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews, Forum Qualitative Soziaforschung/Forum: Qualitative Social Research, 11(3), art 8. doi:10.17169/fqs-11.3.1428

McCusker, K., & Gunaydin, S. (2015). Research using qualitative, quantitative or mixed methods and choice based on the research. Perfusion, 30(7), 537-542. doi:10.1177/0267659114559116

Mogasale, V., Maskery, B., Ochai, R. L., Lee, J. S., Mogasale, V. V., & Ramani, E. (2014). Burden of typhoid fever in low-income and middle-income countries: a systematic, literature-based update with risk-factor adjustment. Lancet Global Health, 2(2014), 570-580. doi :10.1016/S2214-109X (14)70301-8

Mogasale, V., Mogasale, V., Ramani, E., Lee, J. S., Park, J. Y., & Lee, K. S. (2016). Revisiting typhoid fever surveillance in low and middle income countries: lessons from systemic literature review of population-based longitudinal studies.

Moore, L., de Silva-Sanigorski, A., & Moore, S. N. (2013). A socio-ecological perspective on behavioral interventions to influence food choice in schools: alternative, complementary or synergistic? Public Health Nutrition, 16(6), 1000- 1005. doi:10.1017/S1368980012005605

Morgan DW and Krejcie, RV. (1970). Determining Sample size for research activities of Minnesota: USA.

Moustakas, C. (1994). Phenomenological research methods: Analyses and examples in phenomenological research methods. Thousand Oaks, CA: SAGE Publications Ltd. doi. http//dx.doi.org/10.4135/9781412995658

Myers, D. M., & Neuman, M. (2007). The qualitative interview in IS research: Examining the craft. Information and Organization, 17(1), 2-26. doi:10.1016/j.infoandorg.2006.11.001

Nguri KAB. “Risk Factors Influencing Typhoid Fever Occurrence among the Adults in MainaSlum, Nyahururu Municipality, Kenya”. Academic Journal of Biosciences 4.3 (2016).

Nigg, C. R., Geller, K. S., Motl, R. W., Horwath, C. C., Wertin, K. K., & Dishman, R. K. (2011). A Research Agenda to Examine the Efficacy and Relevance of the Transtheoretical Model for Physical Activity Behavior. Psychology of Sport and Exercise, 12(1), 7–12. doi:10.1016/j.psychsport.2010.04.004

Nnebue, C. C., Onwasigwe, C. N., Ibeh, C. C., & Adogu, P. O. U.(2016). Effectiveness of data collection and information transmission process for disease notification in Anambra State, Nigeria.Nigerian Journal of Clinical Practice, 16(1), 483-489. doi: 10.4103/1119-077.116894

Okore Oghale O., et al. “Prevalence of Malaria and Typhoid Fever Co-Infection: Knowledge, Attitude and Management Practices among nurses in Obuda-Aba, Abia State, Nigeria”. American Journal of Public Health Research 3.4 (2015): 162-166.

opalakrishnan V, Sekhar W.Y, Soo E.H, Vinsent R A, Devi S. (2002) Typhoid Fever in Kuala Lumpur and a Comparative Evaluation of Two Commercial Diagnostic Kits for the Detection of Antibodies to Salmonella typhi. Singapore Med J: 43(7):354-358.

Pach, A., Warren, M., Chang, I., Im, J., Nichols, C., & Meyer, C. (2016). A qualitative study investigating experiences, perceptions and healthcare system performance in relation to the surveillance of typhoid fever in Madagascar.

Pang (2008). Typhoid fever research in developing countries. J Infect Developing Countries: 2(6):411.

Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice (4th Ed.). Thousand Oaks, CA: SAGE .

Pirani, S. (2014). Non Compliance with standard precautions: Application of behavioral ecological model. Journal on Nursing, 4(1), 28-34. doi:10.26634/jnur.4.1.2629

Polonsky, J. A., Martinez-Pino, I., Nackers, F., Chonzi, P., Manangazira, P., & Herp, M., V. (2014). Descriptive epidemiology of typhoid fever during an epidemic in Harare, Zimbabwe, 2012. Plos One, 9(12), 1-16. doi:10.1371/journal.pone.011470

Rask, M., Swanhnberg, K., Lindell, G., &Oscarsson, M. (2017). Women’s experiences of abnormal Pap smear results- A qualitative study. Sexual & Reproductive Healthcare, 12 (2017), 3-8. doi:10.1016/j.srhc.2017.01.002

Ravitch, S. M., & Carl, N. M. (2016). Qualitative research: Bridging the conceptual theoretical, and methodological. Thousand Oaks, CA: Sage Publications.

Ritter, C.,Jansen, J., Roth, K., Kastelic, J. P., Adams, C. L., & Barkema, H. W. (2016). Diary farmers perceptions towards the implementation of on-farm Johne’s disease prevention and control strategies.

Roy, J. S., Saikia, L., Medhi, M., &Tassa, D. (2016). Epidemiological investigation of an outbreak of typhoid fever in Jorhat town of Assam, India.Indian Journal of Medical Research, 144(4), 592-596. doi:10.4013/0971-5916.200902

Rubin, H. J., & Rubin, I. S. (2012). Qualitative interviewing: The art of hearing data (3rd ed.). Thousand Oaks, CA: SAGE. Romano V., & Scott, I. (2014). Using health belief model to reduce obesity amongst African American and Hispanic Populations. Procedia-Social and Behavioral Sciences, 159, 707-711. doi: 10.1016/j.sbspro.2014.12.457

Sadeq, T. N., & Jabar, R. K. (2017). Knowledge, attitude and practice of mothers towards typhoid fever disease. Iraq Journal of Medical Sciences, 15(1), 71-77.doi: 10.22578/IJMS.15.1.9

Saldaña, J. (2016). The coding manual for qualitative researchers (3rd ed). Thousand Oaks, CA: SAGE.

Seidman, I. (2012). Interviewing as qualitative research: A guide for research: A guide for researchers in education and the social sciences (3rd ed.). New York, NY: Teachers College

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. Education for Information, 22(2), 63–75. Retrieved from http://www.iospress.nl/journal/education-for-information/

ShimonyKanat, S., & Gofin, R. (2017). Ecological model to factors associated with booster seat use: A population based study. Accident Analysis & Prevention, 108(2017), 245-250.doi:10.1016/j.asp.2017.09.007

Shukula, J. B., Goyal, A., Singh, S., & Chandra, P. (2014). Effects of habitat characteristics on the growth of carrier population leading to increased spread of typhoid fever: A model. Journal of Epidemiology and Global Health, 4(2), 107- 114. doi.org/10.1016/j.jegh.2013.10.005

Spall, S. (1998). Peer debriefing in qualitative research: Emerging operational models. Qualitative Inquiry, 4(2), 280–292. doi:10.1177/107780049800400208

Steele, A.D., Hay Burgess, D. C., Diaz, Z., Carey, M. E., & Zaidi, A. M. (2016). Challenges and opportunities for typhoid fever control: A call for coordinated action, Clinical Infectious Diseases, 62 suppl 1S4–S8. doi.org/10.1093/cid/civ976

Sutton, J., & Austin, Z. (2015). Qualitative research: Data collection, analysis, and management. The Canadian Journal of Hospital Pharmacy, 68(3), 226–231. doi:10.4212/cjhp.v68i3.1456

Thompson, C. N., Karma, M., Acharya, S., Bera, U., Clemens, J., & Crump, J. A. (2014); Typhoid Fever in Fiji: a reversible plague? Tropical Medicine & International Health, 19(10), 1284-1282. doi:10.1111/tmi.12367

Turner, D. W. (2010). Qualitative interview design: A practical guide for novice investigators. The Qualitative Report, 15(3), 754-760. Retrieved from http://nsuworks.nova.edu/tqr?

Unger, S., Wylie, L., Fallah, S., Heinrich, L., & O’Brien, K. (2010). Motivated by money? The impact of financial incentive for the research team on study recruitment. IRB: Ethics & Human Research, 32(1), 16-19. doi: 10.2307/25703688

Wain J, Hosoglu S. (2008). The laboratory diagnosis of enteric fever. J Infect Developing Countries: 2(6):421-425.

Wain, J., Hendriksen, R.S., Mikoleit, M. L., Keddy, K. H., Ochiai, R. L. (2015). Typhoid fever. Lancet (London, England).

Willke A, Ergonul O, and Bayar B. (July 2002) Widal test In Diagnosis of Typhoid Fever in Turkey; Clinical and Diagnostic Laboratory Immunology. 9(4): 938–941.

World Health Organization (2003) Background document: The diagnosis, treatment and Prevention of typhoid fever

World Health Organization. (2010). World health day; urban health issues: Photo gallery. Retrieved from http:// www.who.int/world-heath-day/2010/photo\_gallery/en/

World Health Organization. (2018). E. Coli: Key facts. Retrieved from http:// www.who.int/news-room/fact-sheets/detail/e-coli

World Health Organization. (2018). Immunization, vaccines and biologicals: Typhoid. Retrieved from http://www.who.int/immunization/diseases/typhoid/en/

World Health Organization. (2018). Media center: Typhoid. Retrieved from http:// www.who.int/mediacentre/factsheets/typhoid/en/

World Health Organization. (2018). Water sanitation health: Fast facts.

**APPENDIXE**

**QUESTIONNAIRE**

**PLEASE TICK [√] YOUR MOST PREFERRED CHOICE(s) ON A QUESTION OF YOUR CHOICE**

**SECTION A**

**PERSONAL INFORMATION**

1. **Gender**

Male [ ]

Female [ ]

**3. Age**

20-30 [ ]

31-40 [ ]

41-50 [ ]

51+ [ ]

**4. Education**

Dropout [ ]

Basic Education [ ]

Secondary Education [ ]

Tertiary Education [ ]

**5 Marital Status**

Single [ ]

Married [ ]

Divorced [ ]

Widowed [ ]

**6 Occupation**

Student [ ]

Self-employed [ ]

Employed [ ]

Unemployed [ ]

**SECTION B**

Please indicate the extent to which you are satisfied with the following items by ticking in any option presented in the boxes below.

**Question One**

7. The prevalence of typhoid fever in Onikokoro Community is high.

|  |  |
| --- | --- |
| **Option** | **Please tick** |
| Strongly Agreed |  |
| Agreed |  |
| Strongly Disagreed |  |
| Disagreed |  |

**Question 2:** What is the knowledge of Onikokoro Community nurses towards typhoid fever?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Statement** | **SA** | **A** | **SD** | **D** |
| 8 | Typhoid fever caused by germs |  |  |  |  |
| 9 | Typhoid fever transmitted by drinking contaminated water |  |  |  |  |
| 10 | Typhoid fever transmitted by Eating contaminated food |  |  |  |  |
| 11 | Loss of appetite symptoms of typhoid fever infection |  |  |  |  |
| 12 | Fever and head ache are symptoms of typhoid fever |  |  |  |  |
| 13 | Proper disposal of waste prevents typhoid fever infection |  |  |  |  |
| 14 | Hand washing prevent typhoid fever infection |  |  |  |  |
| 15 | Drinking boiled water prevent typhoid fever infection. |  |  |  |  |

**Question 5:** What are the factors affecting effective personal and environmental hygiene practices in Nsukka?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Statement** | **SA** | **A** | **SD** | **D** |
| 16 | Exposure to sun does not contribute to typhoid fever infection |  |  |  |  |
| 17 | Lack of enough and reliable water sources contribute to typhoid fever |  |  |  |  |
| 18 | Lack of neat/health toilet facilities contributes to typhoid fever |  |  |  |  |
| 19 | Poor sanitation practices contribute to typhoid fever infections |  |  |  |  |
| 20 | Eating unwashed raw vegetables contribute to typhoid fever |  |  |  |  |