2020

Perceptions, Practices, and Risk Factors Associated With Typhoid Fever in Nimo Village, Nigeria

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This is to certify that the doctoral dissertation by

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Walden University
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Abstract

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by

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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February 2020

Abstract

Typhoid fever is a bacterial disease transmitted by the fecal-oral route. In Nigeria, the condition is life threatening and endemic. It affects communities such as Nimo that have limited water, sanitation, and hygiene infrastructure. Previous researchers focused on sanitation and hygienic conditions that contribute to the disease such as household-level hygiene and food and water contamination, including handling practices. However, there is limited knowledge on how the environmental behavior and living conditions of eating and sleeping on a floor harboring fecal materials affect typhoid fever prevalence. The purpose of this qualitative phenomenological study was to explore the perception of the Nimo villagers regarding the contributing risk factors of typhoid fever and the etiology. This study centered on the health belief model that focuses on people's willingness or the ability to change their behaviors. An ecological model was used, according to which individuals interact with their physical and sociocultural environments. There were 15 participants between the ages of 20 and 71 years old who live permanently in Nimo. Face-to-face interviews with semistructured and standardized open-ended questions were used for the data collection. Moustakas's modified Van Kaam's step of the phenomenological analysis was used to analyze the data and report emergent themes. The findings from the participants revealed a limited understanding of risk factors and the causes of typhoid fever. Also, findings revealed that lack of the basic amenities influenced their hygiene practices. Positive social change may result from the policy changes tailored to educating on the effects of the disease and improving the environment for the villagers by providing the needed essential amenities.

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Dedication

This study is dedicated to my family in the United States who has always been there for me in good times and in hard times during the journey. To my beautiful daughter, the baby of the house, Georgia Ilouno, I want you to know that not only that you will always be my baby, but also you are and will always be my inspiration. And as you will be living high school this year with above 4.0 GPA to pursue your dream of becoming an attorney, I want you to know that your daddy and mommy attained the highest degree in education, a doctorate and therefore you should not look back in achieving your dreams. I also want you to remember that I always tell you and your siblings that education is the key to success and a better livelihood. I am hoping you, and your siblings will follow the same path as mommy and daddy.

Finally, I dedicate this to Nimo community my home town you were my inspiration for this study. My passion and goal for the population are to have a typhoid fever free environment. I am hoping that increased awareness on the risk factors or causes of the disease and the provision of lacking essential amenities to the community will help to limit the incidence of the disease not only in Nimo but other neighboring towns within the region of Nigeria and other African countries that lack safe water and practice open defecation.

Acknowledgments

I want to thank Dr. Vibha Kumar, my dissertation committee chair who facilitated my dissertation journey. To Dr. Kimberly Dixon-Lawson, my dissertation committee member, thanks for the guidance and support. To my URR, Dr. Melissa Green, I much appreciated your timely review of my dissertation study. You all did an excellent job during the period. I would not have done it without your expertise. I also wish to thank all my friends and family members that helped me reach this stage in my academic pursuit. Finally, I am forever grateful to all those at whatever organization that includes church, community leaders, and to everyone else I did not mention but contributed in some way to the successful completion of this dissertation.

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In this chapter, I addressed the significance of the study, explained the background of the study, and highlighted the introduction including the problem statement and the purpose of the study. I explained the definition of terms, assumptions, scope and delimitations, limitations. The HBM and EM were introduced as the theoretical lens that will guide this study. In

My purpose in this qualitative phenomenological study was to contribute additional knowledge to the field of public health and community health education by exploring the perception of the Nimo villagers regarding the risk factors of typhoid fever and the etiology. Data from this study could provide new insights to help the policymakers in the region, the public health services, and the NGOs introduce measures. The goal will be to educate on the impacts of the disease and a policy decision for the

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Chapter 1: Introduction to the Study

Typhoid fever is a bacterial disease and considered a major problem in the many low and middle-income countries (LMICs). Humans are the only host, and it is mostly transmitted through the fecal-oral route and ingestion of water or food contaminated by feces from a newly infected individual or an asymptomatic carrier (Kabwama et al., 2017; Polonsky et al., 2014). The disease typically affects communities and informal squatter settlements that practice open defecation, and have limited water, sanitation, and hygiene infrastructure (Akullian et al., 2015; Greenwell, McCool, Kool, & Salusalu, 2013; Mogasle et al., 2016).

The prevalence, incidence, and burden of typhoid fever has continued to increase globally especially in African countries with the estimated rate of 21 million new cases and 222,000 deaths per year in the world (Pach et al., 2016; Polonsky et al., 2014; Steele et al., 2016; World Health Organization [WHO], 2018). In Nigeria, a West African country, the disease is endemic, and most of the residents lack essential amenities such as potable water and functioning toilet facilities (Enabuele & Awunor, 2016). This issue makes them vulnerable to the illness which creates a substantial burden on public health because typhoid fever is a severe, life-threatening illness (Enabuele & Awunor, 2016; Mogasale et al., 2014). According to Alba et al. (2016), knowledge of the risk factors is essential for the prevention of typhoid fever and inadequate hand washing including the consumption of infected street food and drinks that promotes the disease.

Akullian et al. (2015) and Keddy et al. (2016) focused on sanitation and hygienic practices that contribute to the disease; but, I found no literature that specifically

addressed the population of Nimo villagers in Nigeria a part of West African country, concerning their environmental behavior and living conditions. I strove to assess and identify the indicators and factors, the experiences, and the needs of the population who have suffered from typhoid fever in the community. The results of this study may advance the typhoid fever prevention education and awareness that is tailored to the population to enable them adopts the necessary behavior changes that will improve their lives by limiting the incidence of disease in the area.

The sections in this chapter include the introduction to the study, background, problem statement, purpose of the study, research questions, the theoretical framework that guides the study, nature of the study, definitions of terms, assumptions, scope and delimitations, significance, and the summary of the research.

Background of the Study

Typhoid fever infection constitutes a significant public health problem in LMICs, such as those in Africa, and has impacted the quality of life of the residents or the villagers in those regions (Keddy et al., 2016; Mogasale et al., 2016; Polonsky et al., 2014; Shukla, Goyal, Singh, & Chandra, 2014). Despite all the efforts introduced to combat the disease, the public health professionals in those areas have not been successful. A health organization such as the WHO have stepped up in controlling the disease by advocating for typhoid vaccination programs and health education, safe water or water quality, and sanitation improvements, including training of health practitioners in diagnosis and treatment (Mogasale et al., 2016; WHO, 2018). However, it seems that the efforts of WHO have not recorded much success. For example, Pach et al. (2016)

reiterated that globally, approximately 21.7 million new cases and 21,7000 deaths occur as a result of the infection of typhoid fever yearly. Antillon et al. (2017) reported that approximately 17.8 million cases of the disease occur each year in LMICs.

Typhoid fever health education, awareness, and knowledge of risk factors are essential for the prevention of the infection (Alba et al., 2016; WHO, 2018). Numerous studies that centered on ecological and environmental factors, such as lack of proper sanitation and water contamination and have been conducted to address the increasing spread of the disease in African countries; most of these studies recommended that additional measures or intervention are needed (Akullian et al., 2015; Alba et al., 2016; Jung-Seok et al., 2016; Kabwama et al., 2017; Mogasale et al., 2016; Shukla et al., 2014). According to Keddy et al. (2016), despite all these overarching research studies, typhoid fever remains a significant disease in Africa. Literature reviewed as of date revealed that most of these intervention measures to address the spread of the infection have been introduced in the region, but were not effective (Akullian et al., 2015, Alba et al., 2016; Greenwell, McCool, Kool, & Salusalu, 2013; Shukla et al., 2014). Alba et al. (2016) and Akullian et al. (2015) argued that environmental factors or transmission, ecological factors, and limited knowledge on the risk factors of typhoid fever infection are among the reasons why these interventions are not effective in those regions. I addressed the gaps that currently exist in already suggested or implemented typhoid fever control measures by public health practitioners and WHO in the effort to reduce typhoid fever infection or control the disease in Nimo, Nigeria, from the lived experience of the villagers.

Problem Statement

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 Nimo, a rural community of Nigeria, 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, including those in Africa, with 17.8 million approximated cases every year (Antillon et al., 2017; WHO, 2018). As of the year 2014, approximately 21 million cases and 222,000 typhoid-associated deaths that occur annually in the world; however, the infection is life threatening and endemic in Nigeria (Enabuele & Awunor, 2016; WHO, 2018). The disease particularly affects communities and informal squatter settlements that have limited water, sanitation, and hygiene infrastructure, as in rural communities such as Nimo (Akullian et al., 2015; Greenwell et al., 2013; Mogasle et al., 2016; WHO, 2018).

Previous researchers focused on sanitation and hygienic conditions that contribute to the disease such as household level hygiene and, food and water contamination, including handling practices (Akullian et al., 2015; Alba et al., 2016; Mogasle et al., 2016). I have not found literature that addressed the environmental behavior and living conditions of eating and sleeping on a floor harboring fecal materials among Nimo villagers. The population engages in this behavior as common practice. This lack of

literature on these risk factors and the lack of awareness about them may increase the burden of the disease within the population. These conditions or risk factors represent the gap that I strove to bridge by seeking the villager's knowledge of the disease and hygienic practices that influence their behavior.

Purpose of the Study

My purpose in this qualitative phenomenological study was to contribute additional knowledge to the field of public health and community health education by exploring the perception of the Nimo villagers regarding the risk factors of typhoid fever and the etiology. Assessments of the quality of the villager's behavioral patterns were employed together with interviews to develop an understanding of the villagers' perceptions of the disease. This study may stimulate the public health services and the state government in the area to provide educational outreach on the risk factors of the disease in Nimo community.

Research Questions

Main Research Question

What is the lived experience of Nimo villagers concerning typhoid fever and the factors that contribute to it?

Subquestions

1. How do living in houses with no water and functioning toilet facilities in Nimo village influence their health behavior related to typhoid fever?

2. How do Nimo villagers describe their knowledge of typhoid fever, hygienic practices, and open defecation practices in relation to typhoid fever?
3. How do daily activities of villagers living in Nimo including sleeping and eating patterns, sanitary conditions affect their health behaviors associated with the infection of typhoid fever?

Framework

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.

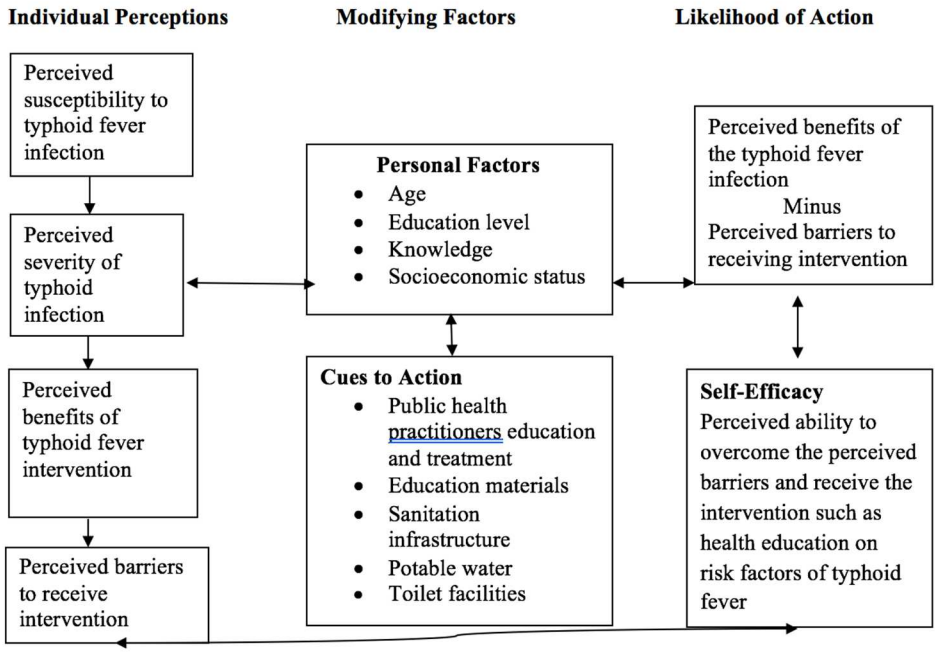

Figure 1. HBM of typhoid fever and prevention.

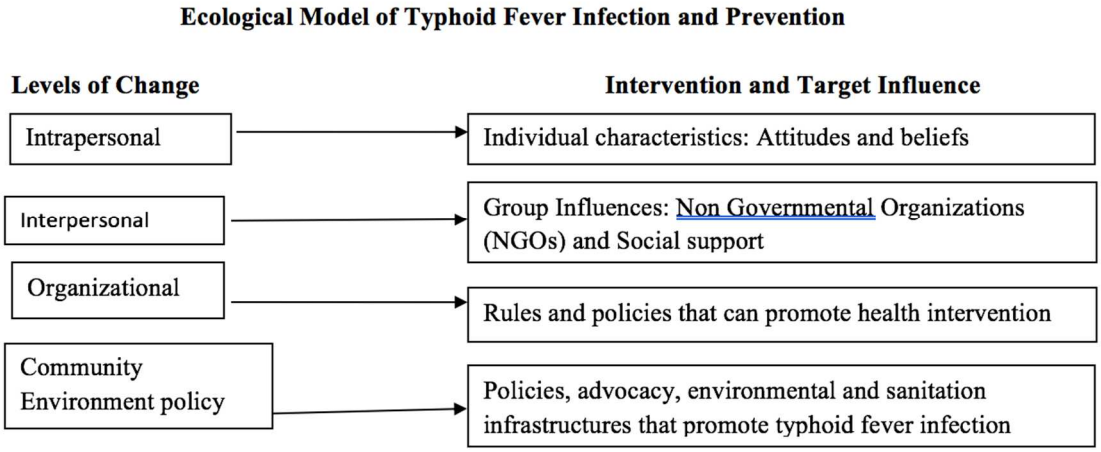

Figure 2. Ecological model of typhoid fever infection and prevention.

Nature of the Study

The nature of the study was a qualitative approach. A qualitative approach aligns with the research questions that centers on what, how, or why during the process of

research and provides the opportunity to understand individuals and phenomena in their natural environments (Leung, 2015; McCuster & Gunaydin, 2015; Ravitch & Carl, 2016). My goal was to understand the experiences of Nimo villagers concerning the contributing factors of the infection of typhoid fever in their community. I introduced a qualitative phenomenological approach among them to capture their lived experiences and perceptions in identifying or specifying an understanding of the infections and the related factors that promote the disease in the area. According to Patton (2015), phenomenology strives to gain or acquire a deeper understanding of the lived experience or the meaning of the everyday experiences of individuals or population which is consistent with this study. The method was appropriate for the investigation of the disease because the villagers experienced the change process in their own community.

Definitions

Asymptomatic carrier: A state or stage where individuals reveal no clinical symptoms of the disease in question but can infect others (WHO, 2018).

Hygiene infrastructure: A term used to describe the availability and quality of water, sanitation, and hygiene (WASH) for infection control (Huttinger et al., 2017).

Informal squatter settlements: Terms used to classify unplanned settlements globally (Gredelj, 2015). They are considered illegal with limited provision for essential social services and typically the only option available for poor people in search for shelter (WHO, 2010).

Open defecation: A process where human feces are excreted or disposed of in the bushes, fields, forests, open bodies of water, beaches, and other available open places (WHO, 2018).

Assumptions

The notion is that most of the Nimo villagers live in houses that have no potable water, functioning toilet facilities and therefore practices open defecation. In this study, my focus was on the adult residents that have a better knowledge and experiences that are willing to share their views and perspectives on typhoid fever infection and meet the selection criteria (Patton, 2015). Considering HBM and EM, I assumed that the individuals in question have the willingness to change their behavior which not only depends on perceived susceptibility to infection, but also on the severity of the risk. The environmental factors or the nature of the environment is useful in behavior change regarding hygiene practices. The results of this study may be helpful in increasing the understanding of the perceptions of the disease, the perception of the effects of open defecation, and including a policy decision for the provisions of toilet facilities and potable water in the community that will limit the impact of the disease among the villagers.

Scope and Delimitations

I explored the lived experiences of Nimo villagers regarding typhoid fever and the factors associated with it. The participants were residents that provided insight into the perceptions that relate to their experiences with the disease from their own perspective. I excluded the natives that live outside the community and therefore not possible to

determine if the views of those that reside permanently differ from the ones that come home occasionally. The residents willing to participate were included in the study. However, limiting the study to villagers that are consistently living at the village in contrast to others, according to Patton (2015), affects the generalization of the study, as confidence is reduced in its applicability and transferability in other settings or groups.

Limitations

The limitation of this study can be associated with having a limited number of participants from the Nimo village. In relation to qualitative research, this may impact the research findings and conclusions for generalization (Patton, 2015). I used semistructured and standardized open-ended interview questions for the study. The idea was to increase the comparability of responses and for the participants to respond in according to their choice; but, they tend to be subjected or limited to the same questions (Patton 2015; Rubin & Rubin, 2012). However, this process may pose a limitation to the study because the interview approach not only may be unfair to participants but can limit those who have more stories or answers to the questions concerning their experiences with the typhoid fever infection.

Researchers' bias during study can be an issue due to personal assumptions about preconceptions. In this case, even though I did not grow up in the Nimo village, I have spent a significant amount of my life in the community, which may promote bias and prejudice due to possible predispositions to participants and the environment in question. To avoid these, I engaged in bracketing by focusing my thought, beliefs, and any

preconceived notions to enable me clear my mind concerning the phenomenon of interest (Moustakas, 1994; Patton, 2015).

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 Nimo. A typical Nimo resident eats and sleeps on the floor, lacks potable water and functioning toilets, resulting in open defecation which are among the risk factors for typhoid fever (Mogasle et al., 2016; Shukla et al., 2014). 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. According to Alba et al. (2016), knowledge of risk factors and their usefulness in different settings is needed to design a robust health education concept for the prevention of typhoid fever. There is a need for the population to increase their knowledge of the risks factors. A review of the literature revealed that this is the first study to seek the experiences of Nimo villagers on the disease. The information collected could provide a better understanding of the factors that influence their behavior. 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.

Summary

Typhoid fever has continued to be a significant problem in developing countries, especially for those in Africa. The risk factors are higher in populations that have limited access to safe water, proper sanitation, and the poor communities are at the highest risk (WHO, 2018). The WHO reported that the disease remains a public health problem; but, improving living conditions, adequate sanitation, and safe drinking water will reduce typhoid fever morbidity and mortality in those areas.

This study is necessary to Nimo residents or villagers because they will be given the opportunity to communicate their experiences in their natural settings or environments, which is consistent with qualitative research (McCuster & Gunaydin, 2015; Ravitch & Carl, 2016). The goal was to have a better understanding of their experiences concerning the contributing factors of the infection of typhoid fever in their community. This requires a good knowledge of the hygienic practices by the residents. In this chapter, I addressed the significance of the study, explained the background of the study, and highlighted the introduction including the problem statement and the purpose of the study. I explained the definition of terms, assumptions, scope and delimitations, limitations. The HBM and EM were introduced as the theoretical lens that will guide this study. In Chapter 2, I will present a review of the literature. Chapter 3 will center on the methodology of the study. Chapter 4 will be an explanation of the data findings or the

result of the study. Finally, in Chapter 5, I will be presenting the analysis, conclusions, and recommendations for future research.

Chapter 2: Literature Review

Introduction

Typhoid fever is caused by the bacterium Salmonella Typhi usually through oral-fecal 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). In this section, I will address the perceptions and practices of Nimo villagers regarding the contributing factors and the control measures already in place or employed in controlling the spread of typhoid fever infection in their community as regards to its effectiveness or ineffectiveness.

The literature review for this study is crucial to the topic of study. It revealed that despite numerous research findings that centers in those LMICs and recommendations for the way forward on the appropriate measures to control the disease, the public health practitioners, or the governmental agencies failed to limit the infection in the area. 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. The major sections of this chapter will address the primary components of the theories that will guide the study, and I will review the literature that is appropriate and associated with the study

Literature Search Strategy

The relevant literature reviewed was from journals, research papers, and studies related to this study. I retrieved literature from different databases and search engines such as CINAHL & Medline combined search, CINAHL Plus with full text, ProQuest Health & Medical Collection, ProQuest Nursing & Allied Health Source, and PubMed. Google was the primary search engine which included Google Scholar. The basic key search terms used included *typhoid fever, typhoid fever infection typhoid fever in African countries, hygiene practices and typhoid fever, beliefs, and attitudes on hygiene, perception of hygiene practices, lived experiences on typhoid fever, phenomenology , typhoid fever in developing countries, typhoid fever in industrialized or developed countries, causes of typhoid fever, risk factors of typhoid fever, typhoid fever and fecal materials, typhoid fever and food, typhoid fever and water, food handlers and typhoid fever, typhoid fever and environmental risk factors, including sanitation and typhoid fever.*

The key search terms were selected according to the relevance to the study topic, and the literature review did not center only in Africa but also in developed nations such as the United States which Imanishi et al. (2015) reported having limited numbers of incident cases of typhoid fever since the year 1940. Reviewing literature from industrialized nations or developed countries was useful to the study in relation with the importance or significance of improved drinking water and improved sanitation infrastructures or facility in contrast to African countries and particularly Nimo community or village the focus of my study. The literature reviewed from this study was

from 2013 to present. However, I included additional literature for more than five years old due to its relevance to the study.

Theoretical Foundation

The HBM and EM served as the theoretical framework for this study.

Origin of the Health Belief Model

The HBM was first utilized by social psychologists (Hochbaum, 1958; Rosentock, 1960) in the United States public health service to explain the vast failure of people to participate in programs that not only prevent disease but create awareness of the disease in question (Adams et al., 2014; Bishop, Baker, Boyle, & MacKinnon, 2015; Glanz et al., 2015). It is among the first theories of health behavior and one of the vast recognized in the field of health promotion or prevention that used in evaluating health behavior (Dardis, Koharchik, & Dukes, 2015; Romano & Scott, 2014). According to Adams et al. (2014), the two primary assumptions of HBM are that individuals subjectively tend to value avoiding illness and believe that employing a specific or proposed health intervention will prevent disease. The thought or focus of HBM, according to Glanz et al. (2015), is that individuals are most likely to engage in health behavior they believe that they are susceptible to a condition or vulnerable for a disease and the situation could have potentially adverse consequences such as in this study. The model relates to behaviors that have the potential or the likelihood of limiting the risk of acquiring a disease including the effects of the already existing illness or condition (Glanz et al., 2015).

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).

Relationship of Health Belief Model and the Study

The premise is that HBM relates to peoples perceived susceptibility and severity to the disease and the perceived probability of limiting the exposure of the infection (Adams et al., 2014). I used HBM to guide the intervention for achieving a positive social change. It serves as a guide for the implementation with a goal of stimulating or advance the knowledge of behavior change to prevent the infection including the adverse impacts of the disease as a result of lack of proper hygienic and sanitary practices within the community. The purpose or the focus of the intervention centered on the exploration of the villager's perception concerning the risk factors of typhoid fever and the etiology because of their limited understanding of the risk factors of the disease and the process of transmission. The primary objective is to improve their knowledge on the concepts of the disease to enable the villagers to take control of their lives to adhere to proper sanitation

that is required to reduce the spread and contamination of the disease which relates to the constructs of HBM.

Origin of the Ecological Model

The EM originates from biological science which relates to the interrelationships between organisms and environments (Glanz et al., 2015; More et al., 2013). EM associates with behavioral sciences and public health by focusing on people's interaction with their physical and sociocultural environments (Glanz et al., 2015). The model provides a framework for integrating multiple theories with a goal of system thinking which serves as a meta-model to ensure that environmental and policy factors are considered or included in designing or formulating a comprehensive and robust approach to evaluating and intervening on health behaviors. The EM is designed with the notion that numerous factors influence health behaviors at management levels, and all the levels are significant (Glanz et al., 2015; Moore et al., 2013; Prani, 2014). According to Glanz et al. (2015), healthy behaviors are considered optimal when environments and policies promote healthful choices, and individuals are motivated and educated to make those choices which are consistent with EM.

Theoretical Application of Ecological Model

The EM has been applied by many researchers to understand the relationship with subjects or phenomenon of interest in the environments (Gargari, Hosseini, & Ahmadi, 2018; Shimony Kanat & Gofin, 2017; Moore et al., 2013; Pirani, 2014). The notion is that human development is shaped by some systems or conditions which individuals are involved (Moore et al., 2013). In a population centered study, Shimony Kanat and Gofin

(2017) utilized the ecological model to identify the primary determinants of belt-position booster seat use (BPB). The model was introduced to evaluate individual, parent-child relationship, and neighborhood characteristics or the environmental conditions. Shimony Kanat and Gofin revealed that numerous determinants such as individual and parental which involve the number of children in the family, the parent's car seat belt use, and the parents understanding of children car safety practices associated positively with the BPB use. In the neighborhood level, the findings show a difference between neighborhood for BPB users in contrast to nonusers (Shimony Kanat & Gofin, 2017).

Pirani (2014) sought to address the problems of the noncompliant behavior of nurses that results in injury in a clinical setting. Considering that EM uses the available resource for producing a possible behavioral change at numerous levels that includes individual, local, community, and social or cultural level (Pirani, 2014). The behavioral EM was applied to point out the factors of non-compliance and the ways to eliminate those factors. Pirani indicated that the issue with the nurses centered on the individual level and concluded that the behavior change or modification within individual requires a gradual process and it needs understanding the individual's knowledge and the perception on the issue in question to change the behavior.

The EM was also previously applied in the evaluation of the impact of the intervention that promotes physical activity of female employees by Gargari et al. (2018). Considering that focus of EM does not only center on changing the individual factors but on improving the physical and social environments; the findings according to Gargari et al. showed that intervention planning through the concepts of EM may be useful in

advancing or promoting physical activity with female employees of universities. Gargari et al. concluded that utilizing educational program with low-cost practices that includes walking for 30 minutes a day at workplace improves the level of physical activity of an individual. I applied the concepts of EM in a similar way to the above studies to explore the experiences of the Nimo villagers as a result of the environmental conditions concerning sanitary practices. I utilized EM as a lens in evaluating the effect of their interaction with their physical and sociocultural environments including the effectiveness of the role of different systems in the environment that promotes healthy and unhealthy choices associated with spread and controlling of typhoid fever infection.

Justification for the Choosing Ecological Model

The EM was chosen over other theories or model because the environmental and policy levels of influence differentiate it from other behavioral models and theories that relate to individual characteristics and environmental impact which is consistent with Nimo villagers (Gargari et al., 2018; Glanz et al., 2015). The model employs all available resource for producing sustainable behavioral change at numerous levels that includes intrapersonal, interpersonal, organization, community, and policy levels such as ensuring the availability of water and functioning toilets facilities which influence health behaviors (Glanz et al., 2015; More et al., 2013; Pirani, 2014). The model can enable to develop a full understanding of the factors that influence the behavior in question and what is needed to change those behaviors (Glanz et al., 2015). As a result, this model is considered appropriate for this study.

Relationship of Ecological Model and the Study

EM was chosen to be applied in this study because it can reinforce or help to create a full understanding of the factors associated with the behavior that can promote the infection of typhoid fever (Glanz et al., 2015; Pirani, 2014). The Nimo villagers stand to benefit from these five principles of ecological perspectives on health behavior: There are numerous levels of influence on health behaviors which centers with intrapersonal, interpersonal, organizational, community and public policy levels such as ensuring the availability of water and functioning toilets which influence health behaviors (Glanz et al., 2015; Pirani, 2014).

Environmental contexts are vital predictors of health behaviors. The actions can be predicted more accurately from the conditions such as the case of typhoid fever that affect the people and their characteristics (Glanz et al., 2015). Influences on behaviors relate across levels. The interaction of influences indicates that variables work together such as the individual's strong motivation to ensure proper sanitation standards even though the scarcity of water may be different from those that have lower motivation morale (Glanz et al., 2015). EMs are expected to be behavior specific. The belief is that the model is more efficient when the targeted interventions are tailored to the behavior change in question which in most cases the environmental and policy variables are behavior specific (Glanz et al., 2015).

Multilevel interventions are considered the most effective in changing behaviors. In the case of lack of safe water found among Nimo population and the adverse impacts of typhoid fever infection as a result of sanitation issues. The belief is that educational

interventions, when utilized to change views and behavioral skills, works better when policies and environments support behavior changes. (Glanz et al., 2015).

In the following sections, I will focus on the actual literature review on the main ideas and key concepts for this study that includes an overview of typhoid fever, perception, beliefs, and attitudes, lived experiences/phenomenology, Informal squatter settlements/ rural and urban, and interventions/ prevention of typhoid fever.

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 Jung-Seok 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.

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).

Lived Experiences/Phenomenology

Researchers have utilized the phenomenological approach with the goal of understanding the lived experiences of individuals concerning disease or a condition and the meaning of key factors or variables associated with them (Chan, Dai, Chien, & Chan, 2016; Hassan, Izadi-Avanji, Rakhshan, & Alavi Majid, 2017; Filhour, 2017; Jinruang, Phuphaibul, Jiawiwaktkul, & Panitrat, 2017; Lamothe & Guay, 2016). According to Patton (2015), a phenomenological approach or interviewing is used to obtain a personal description of a lived experience to be able to adequately describe a phenomenon of a targeted situation or event which relates with my study.

Utilizing a phenomenological approach and semistructured interviews, Chan et al. (2016) explored the lived experiences of individuals with chronic pulmonary disease (COPD) after hospitalization for acute exacerbation or pneumonia. The researchers utilized a purposive sampling of 14 participants from northern Taiwan in their study. They discussed that lived experiences of individuals could differ under health care systems, social cultures, and living conditions. The study findings indicated that the participants exhibited a positive attitude which not only is needed to promote or encourage in self-management of the disease but also shows that people with COPD are willing to cope with the disease

Filhour (2017) employed a phenomenological method to understand the basic understanding of the lived experiences of suffering, bearing suffering, and becoming through suffering as explained by male blunt trauma individuals. According to Filhour, the study participants were seventeen male whose interviews focused on their lived

experiences of suffering. Filhour discussed the importance of utilizing a phenomenological approach which centers on how individuals interpret or describe their worlds, and how the researchers can explain their interpretations. The assumption is that individuals tend to reveal their experiences through dialogue or conversation (Filhour, 2017). The research findings indicated that the participants revealed mostly in experiencing physical suffering, emotional suffering, social suffering, economic suffering, and spiritual suffering. The spiritual suffering that relates to the individual's routine pattern of spirituality was considered the least experience from suffering. The notion or the belief about intervention on the suffering is that the participants acknowledged the need for support from others to mitigate or reduce their suffering which requires the provision of the knowledge the individual in question can use to have an understanding and regain lost control (Filhour, 2017).

Jinruang et al. (2017) also conducted a qualitative phenomenological study that centers on exploring the lived experiences of Thai adolescents that dropped out from school and engaged in health-risk behaviors. The participants were 14 individuals who live in the urban slum of Thailand and a semistructured interview including focus discussion groups were used to collect their life experiences and perspectives on life (Jinruang et al., 2017). The researchers discussed that health-risk behavior relates to the activity undertaken by individuals or a vulnerable population with a frequency or intensity which increases or elevates the rate of the risk of a disease or condition. Their study findings showed that the lived experiences that relate with perceived family

atmosphere, entering early adulthood, and peer relationship or influence associated with health risk-behaviors which is consistent with similar previous studies.

Hassan et al. (2017) and Lamothe and Guay (2017) focused their studies on having a clear or a full understanding of a meaning of variable or factor that associates with disease or condition. Hassan et al.'s objective was to understand the meaning of resilience and its formation for hospitalized elderly individuals who experience chronic conditions. With the purposeful sampling of 22 participants, the researchers used semistructured, and face-to-face interviews to collect data. The researchers theorized that having a more definite knowledge or understanding of the meaning of resilience in a targeted population can help or lead to a better health outcome. Their findings validate their theory and thus noted that improvements in resilience and the ability to overcome health issues relate with a patient or individual-oriented approach which most times achieved through family members, health team, or organizations of interest.

Lamothe and Guay (2017) conducted a study with a phenomenological approach to understand how experiencing an act of workplace violence (WPV) can influence how participants perceive their work and the meaning assigned or labeled to it. The participants were 15 healthcare workers of 11 women and four men who have been victimized by the incident of physical or sexual assault by a patient. The researchers discussed the ways participants make meaning of their work (MOW) about workplace violence (WPV) which may lead to a greater knowledge of the adverse impact or the consequences. Lamotte and Guay indicated that WPV can change some aspects of MOW which enables to explain why WPV is related to a lower rate of job satisfaction.

Even though all these qualitative studies centered on various diseases and conditions, they all demonstrated how a phenomenological approach can be used to obtain or describe personal lived experiences of individuals or the population from the persons point of view which is consistent with my study on typhoid fever (Chan et al., 2016; Filhour, 2017; Hassan et al., 2017; Lamothe & Guay, 2017; Patton, 2015; Jinruang et al., 2017).

Informal Squatter Settlements/ Rural and Urban

One billion which is about 15 % of the world population practice open defecation and 71% of those that lack sanitation lives in rural areas with 90 % of the entire open defecation taking place in those areas (WHO, 2018). Informal squatter settlements and urbanization have the potential to increase the global burden and the risk of typhoid fever particularly in less or developing countries of Africa (Akullian et al., 2015; Greenwell et al, 2013; Jung-Seok et al., 2016; Keddy et al., 2016; Mogasale et al., 2014; WHO, 2018). Squatter settlements are usually illegal and seldom have access to essential amenities and social services, but typically represent the only available option open to poor people, migrant or local, in need of shelter (WHO, 2018).

Nimo is considered a rural community in Anambra state, Nigeria a West African country and is among the 177 towns or village that made up the region (Anambra State Government [ANSG], 2017; Nnebue, Onwasigwe, Ibeh, & Adogu, 2016). According to ANSG (2017), 60% of the Anambra indigenes live in urban areas making the state one of the most urbanized places in Nigeria. Urbanization in Nigeria is as a result of population growth, immigration, and better infrastructures such as good road, water, and electricity

that helps in advancing villages into towns, town into cities, and cities into metros (ANSG, 2017). Mogasale et al. (2014), following their study on the burden of typhoid fever in low and middle income countries and in the process of estimating or projecting typhoid fever incidence in relation to risk factors, considered high risk as rural population or community that have no access to safe or improved water and an urban population living in slums. At risk was classified as a rural population that has access to safe water and urban population not living in slums (Mogasale et al., 2014).

Akullian et al. (2015), Greenwell et al. (2013), Jung-Seok et al. (2016), Keddy et al. (2016), Polonsky et al. (2014), and Mogasale et al. (2014) highlighted the impacts of informal squatter settlements and rapid or increasing urbanization in developing countries, and pointed out and discussed the risk factors of diseases that is associated with the condition or the environment. Greenwell et al. discussed how the untreated or abandoned wastes, increasing and depending on borehole wells for household duties and consumption, frequent flooding, and limited water sanitation and hygiene infrastructure in the informal squatter settlements increases the risk of typhoid fever.

Akullian et al. (2015) evaluated the role of environmental sources or factors in the transmission of typhoid fever among the adults and children living in the urban slum of Kenya an African country. Their hypothesis centered on the adverse impact of fecal material in low elevation areas due to downstream flow and fecal waste accumulation. The result findings confirmed their hypothesis by showing that environmental transmission of typhoid fever contributes to the risk of disease especially in children

because of their likelihood of outside play or activities where fecal materials are mostly found (Akullian et al., 2015).

A significant number of individuals in Africa live in rural areas, such as the case with Nimo villagers. Most of them lack essential amenities that include proper housing structures, potable water, and toilet facilities which have resulted in defecating and urinating in the bushes and open places (WHO, 2018). According to Shukla et al. (2014), these conditions or habitat characteristic promotes a conducive or favorable environment for breeding, growth, and survival of flies that transport the bacterial which spread the disease. Alba et al.(2016), Greenwell et al. (2013), Mogasale et al. (2014), and Thompson et al. (2014) highlighted rural areas in their studies on typhoid fever and the associated risk factors that impact the low-income and middle income or developing countries, but their studies only centers on urban population. There are limited literature and discussions on typhoid fever among rural community or dwellers in those regions which applies to Nimo indigenes the center of the study.

The focus on the urban population may create a knowledge gap among the rural dwellers in the developing countries, and Jung-Seok Lee et al. (2016) agreed. Following their study on the geographical distribution of typhoid fever risk factors among the low and middle-income countries; not only they acknowledged that huge knowledge gaps on the disease burden of typhoid exists in most parts of developing countries, but also indicated that more attention centers on urban or urban slums and less attention given to non-urban or rural areas. Most of the studies have been limited to small areas of urban slums or population (Akullian et al., 2015; Jung-Seok Lee et al., 2016). My study will be

conducted in a rural community of Nimo indigenes with the goal of bridging the gap that may exist in knowledge on typhoid fever as a disease and the associated risk factors.

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.

Summary

Although humans are the only host of typhoid fever, the transmission or spread typically results from ingestion of water or food contaminated by feces from an acutely ill individual or an asymptomatic carrier (Kabwama et al., 2017). Individuals and communities, including public health practitioners, encounter numerous challenges in controlling the disease. The notion is that prevention of typhoid fever requires not only the provision of essential amenities to the community, but also requires clean water and sanitation infrastructure, maintaining adequate individual and household hygiene, food safety practices, health education, community outreach awareness programs, and a robust medical service (Kalijee et al, 2017; Lee et al., 2013).

Researchers thus far have identified improper hygienic practices and sanitation infrastructure, limited water supply, poor environmental condition as a result of open defecation practices including lack of knowledge or understanding of the etiology of the disease as the contributing factors. The perception, beliefs and behavior attitudes of Nimo villagers towards the concept of typhoid fever as a disease may constitute a gap I will strive to bridge by promoting a clearer understanding of the disease among the population which can help or lead to a better health outcome.

Intervention strategies that constitute awareness promotion, education on the importance of personal and household hygiene, and sanitary conditions which relate to open defection practices will be the critical focus on proposing intervention for implementation in my study. Reinforcing or introducing these factors or elements and

identifying their perception, beliefs, and behavior attitudes towards the disease is crucial to control the infection.

A qualitative method of face-to-face interviewing and focus groups discussions was utilized to explore the perceptions and understanding of typhoid fever risk factors and the preventive measure (Greenwell et al., 2013). Hygienic practices and perceptions of individuals are investigated by employing semistructured questionnaires (Greenwell et al., 2013). Face-to-face interviews not only provide a closer interaction between the participants and the researcher, but also enables to gain focused insight into lived experiences and how the participants interpret the meaning of the constructs reality about the phenomenon in question (Ravitch & Carl, 2016). In this study, I will use face-to-face interviews and semistructured questionnaires with standardized open-ended interview questions to investigate the perception that centers on hygiene beliefs, attitudes, and practice of Nimo Villagers in Nigeria regarding the risk factors of typhoid fever and the etiology. In Chapter 3, I will present in detail the methodology for this study. Chapter 4 will center on data findings and results while Chapter 5 focuses on discussions or analyzing the results, my recommendations, and my conclusions.

Chapter 3: Research Method

Introduction

My purpose in this study was to contribute additional knowledge to the field of public health and community health education by exploring the perception of the Nimo villagers on the risk factors of typhoid fever and the etiology. I introduced a qualitative phenomenological approach to seek and describe their individual experiences, the quality of their behavior or attitude patterns, identify needs and gaps, and offer solutions for positive social change. My study findings also could stimulate the public health services and the state government in the area to provide educational outreach programs that includes the awareness on the risk factors of the disease in the community and for further research on the subject matter or the phenomena of interest.

In the first section of Chapter 3, I will present the research design, explain the primary concepts of the study, and will also identify the rationale and tradition for the study. The second section will comprise the role of the researcher in the research and the third section; I will explain the methodology of the study with a full description of the site, participants, instrumentation, and the procedures for data collection and analysis. In the fourth section, I will describe the issues of trustworthiness, the credibility, reliability, transferability, and ethical considerations of the study. Finally, the fifth section will center on summarizing the chapter.

Research Design and Rationale

Research Question

The primary research or central question centers on the perceptions of the hygienic and sanitation practices associated with the risk factors of the disease. I used the subquestions to seek more clarification and understanding of the participant's perception of those practices and the contributing factors of the infection.

Main Research Question

What is the lived experience of Nimo villagers concerning typhoid fever and the factors that contribute to it?

Subquestions

1. How do living in houses with no water and functioning toilet facilities in Nimo village influence their health behavior related to typhoid fever?
2. How do Nimo villagers describe their knowledge of typhoid fever, hygienic practices, and open defecation practices in relation to typhoid fever?
3. How do daily activities of villagers living in Nimo including sleeping and eating patterns, sanitary conditions affect their health behaviors associated with the infection of typhoid fever?

Phenomenon/ Research Tradition

My objective was to understand the experiences of Nimo villagers concerning the contributing factors of the infection of typhoid fever in their community. I explored the participants lived experiences in identifying the understanding of the disease and the

associated risk factors that promote the infection. The choice of approach to answer the research question for this study was a qualitative tradition that centers on a phenomenological research. According to McCuster and Gunaydin (2015), Patton (2015), Ravitch and Carl (2016), Sutton and Austin (2015), qualitative research focuses on a methodological pursuit of helping researchers to evaluate the thoughts and feelings of research participants to understand the meanings they assign to their experiences concerning a targeted phenomenon such as the case of typhoid fever among the Nimo villagers the focus of my study.

The notion as postulated by Sutton and Austin (2015) is that while quantitative research concepts are utilized to identify how many people are involved in a particular behavior of concern, the qualitative approach enables researchers to understand how and why such practices take place which is consistent and essential to my study. If the goal is to know how participants or population perceive a targeted issue, then the qualitative approach is considered as the most appropriate method to answer the questions which are the case with my study (McCuster & Gunaydin, 2015). Typically, according to McCuster and Gunaydin (2015) Qualitative method is used to answer questions that center on what, how, or why of a phenomenon and these apply to the research questions formulated for this study.

Creswell (2014) described phenomenological research as method of investigation that originates from philosophy and psychology where the researcher explains the lived experiences of individuals about a phenomenon as pointed out by the participants. By capturing their explanation or description of their lived experience, a researcher will be

able to have a full account of the individual personal knowledge or experience of the phenomenon in question (Creswell 2014; Patton, 2015). This method is suitable for the investigation of typhoid fever among the Nimo villagers because they experienced the change process in their living environment or natural settings (Patton, 2015). I was evaluating the quality of their behavioral patterns and the understanding of their lived experience and how to identify the individual outcome of the participants by analyzing their perceptions and knowledge.

Researchers such as Jinruang et al. (2017) utilized a qualitative phenomenological inquiry to understand the health-risk behaviors among the Thai adolescents who quit school. Chang et al. (2016) used the same approach to investigate the lived experiences of individuals with chronic obstructive pulmonary disease (COPD) following their discharge from the hospital. These researchers illuminated the lived experiences of the participants who associated or have contact with the phenomenon of interest which is significance to my research and hence the qualitative phenomenological approach.

Role of the Researcher

In a qualitative study, the researcher is considered the primary instrument for data collection during the period of the research process, and typically the role is to strive to evaluate the thoughts and feelings of the participants (Creswell 2014; Ravitch & Carl, 2016; Sutton & Austin, 2015). The design or formulation of a phenomenological approach enables a researcher to describe the participants experience from their viewpoint (Creswell 2014; Patton, 2015). To achieve this concept or in other words to understand the perceptions and lived experiences of the Nimo villagers on the

phenomenon in question, my role in the study will center on being open-minded, observer, interviewer, explorer, analyzer, investigator, and data collector. I will bracket my feelings or in other words the world so that it will not influence or interfere with findings because I am a native of the village, though I do not live permanently with the population, I interact with them once or twice a year during my visit that usually lasts 4 to 6 weeks long. My roots are embedded in the community and considered it home by having a house in the village.

According to Patton (2015), bracketing enables the researcher to set aside the passion or personal feelings and experiences to maintain an open mind to explore the phenomenon in question. A researcher is expected to bracket any personal previous knowledge or opinions and theoretical knowledge, not centered on direct intuition or perception no matter the source to allow full attention given to the phenomenon (Patton, 2015; Ravitch & Carl, 2016). I employed understanding and suspend any preconceptions or judgments despite the participant's perspectives in this study.

Biases

In controlling bias, Sutton and Austin (2015) posited that if being reflexive researchers should not strive to ignore or set aside their own biases but instead needs to reflect upon and fully explain where they stand or their position on the investigation of the issue in question. To control bias in this study, I am aware that my previous experiences that came from staying in the Nimo and with my interaction with those that live permanently in the village or the community may introduce some kinds of bias and prejudice into the study. My understanding is that to ensure that the research is not

impacted with the personal opinion or compromised, it is essential for me to be objective and open-minded throughout the research process. I introduced in-depth interviewing and record all my interviews and review the responses with the participants including the conclusions.

Incentives

The WHO (2018) revealed that poor communities or lower socioeconomic status communities are more vulnerable to the risk factors of typhoid fever which is consistent with Nimo community. Most of the population that reside permanently in the village have limited income and depends on farming or vending business locally to meet their daily needs. Providing incentives especially to high risk or vulnerable population with limited income increases the rate of recruitment and participation among research participants (Brandon et al., 2018; Unger, Wylie, Fallah, Heinrich, &O'Brien, 2010).

Brandon et al. (2018) highlighted that typically the focus mostly centers on stopping undue inducement or incentive which often results from participants not fairly compensated for their significant contribution to the study. They discussed that instead of focusing on incentives to limit excessive influence, researchers and institutional review boards (IRB) need to encourage payments that are reasonable. Brandon et al. concluded that offering appropriate incentives reduces the risk of exploitation and elevates the chance of recruiting a wide range of research participants which could be applied or useful to my study.

Like Brandon et al. (2018), Unger et al. (2010) supported the idea of incentive for the study participants. They noted that among the obstacles or limitation faced by the

research investigators is getting participants to enroll in research. The analysis of their study revealed that financial remuneration or incentive increases the rate of enrollment. My goal was to use an incentive to facilitate this study, and I either provided each participant financial incentive worth about 5 United States (U.S.) dollars or a gift of prepaid calling card of the same amount to appreciate their effort and time spent.

Methodology

Participant Selection Logic

I introduced a nonprobability sampling approach with the purposeful sampling technique in this study to select participants that have a better knowledge and experiences of the phenomenon in question and meet the selection criteria (Babbie, 2017). The idea or the logic according to Patton (2015) and Creswell (2014) is that not all people in the community have a chance of participating in the study. But with purposeful sampling, I selected members of the population that will provide information-rich cases for in-depth research that will help to understand the problem and answer the research question which is critical to the purpose of my study. Nimo community has four quarters; Etiti, Egbengwu, Ifiteani, and Ifite-enu. These regions represent the population and participants will be chosen relatively in these areas to provide the needed information.

The initial contact was through passing out of fliers to the churches in the community for recruitment and followed by sending interview letters which included the purpose of the research and the explanation of the informed consent (Patton, 2015). In the process of setting the appointment and working out the format, I considered individuals who have the knowledge and experiences on the subject and invite them for the interview

(Patton, 2015; Rubin & Rubin, 2012). I asked for their consent for participation while revealing to them the purpose of the study and the explanation if there will be any potential risk or benefits involved. According to Rubin and Rubin (2012), it is essential that while making the contacts that it is prudent to inform the significance of the study and the reasons for participation including that their presence is voluntary.

Saturation and Sample Size

Guest, Bunce, and Johnson (2006) and Mason (2010) addressed the issue of saturation and sample size. Mason argued that while saturation dictates most of the qualitative sample size that is also significant to consider other factors such as the purpose of the study which is the motivating driver or element of a research project. The perception is that a small sample size with limited scope or modest claims tends to achieve saturation faster than a study formulated to describe a phenomenon or a process that extends to other disciplines (Mason, 2010). However, Guest et al. (2006) asserted that in most cases especially in the purposive sampling such as my study that waiting to reach saturation is not an option and typically researcher's focuses on the number of the interviews introduced in the proposal. They are expected to consider estimating at which point the saturation may occur (Guest et al., 2006).

In phenomenological studies, researchers suggested having between five to 25 participants in a study but noted that in most cases six to twelve interviews tend to achieve the required research objective (Guest et al., 2006; Mason, 2010). Larger samples are needed when evaluating variation among distinct groups, and if the goal is to seek to understand the basic perceptions and experiences within a group of identical or

homogenous individuals such as the Nimo villagers, twelve interviews or participants should meet the requirements (Guest et al., 2006). Considering the reveal from these researchers, I selected a sample size of 15 participants for my study from the Nimo community which gave me the needed information to answer my research questions. The criteria that I used to select these participants were:

1. Participants are adults and 18 years and above.
2. Participants reside permanently in the village or the community.
3. Participants can read and write in English
4. Will select participants in each four quarters of the community; Etiti, Egbengwu, Ifiteani, and Ifite-enu Nimo.
5. Will exclude natives of the village that live outside but come home occasionally.

Instrumentation

The interview questions and protocol were formulated based on a phenomenological interview to seek the understanding of the lived experiences of the Nimo Villagers regarding typhoid fever. According to Patton (2015), a phenomenological interview approach is used to capture lived experience which enables to describe the phenomenon of interest in a factual and lived through terms adequately. I began the interview protocol or guide questions with an introduction that explains the purpose of the interview and ends with exit or conclusion that indicates what to expect following the conversation with the participants (Jacob & Furgeson, 2012; Myers, & Neuman, 2007; Turner, 2010). Semistructured and standardized open-ended interview questions will be

introduced for the study. My goal was to increase the comparability of responses and for the participants to respond in according to their choice (Patton 2015; Rubin & Rubin, 2012). I recorded all interviews, and I took fields note to maintain an audit trail as suggested by Anney (2014) to promote the concept of validity and credibility. I also introduced the idea of saturation during the process when repetition of answers occurs, and themes or categories to indicate a conclusion as demonstrated by other phenomenological studies from researchers such as Chang et al. (2016); Rask, Swahnberg, Lindell, and Oscarson, (2017).

Procedures for Data Collection

The interview format for my study centered on phenomenological interviewing: According to Creswell (2014) and Patton, (2015), a phenomenological study strives to gain access to individual lived experiences to describe a phenomenon in question adequately. I introduced a face-to-face individualized interview to achieve this process by exploring the Nimo villager's perception, practices, and their experiences about the risk factors of typhoid fever. My goal was to utilize in-depth qualitative interview not only to enter into the participants perspective but also to understand how they view and the meaning they make of the experience associated with the disease (Patton, 2015; Ravitch and Carl, 2016; Seidman, 2012).

The interview guide was utilized to facilitate the interview process and is expected to reduce the anxiety associated with the interview concepts. According to Rubin and Rubin (2012), among the methods to reduce the tension during the interviewing is to prepare and have the conversational or interview guide that outlines the

protocols and questions for the interview. I took notes for the audit trail, and audio record or tape the interview and reviewed it with my research notes to ensure that it gives the exact reflection of the conversation or interaction, and each session will last between 30-45 minutes (Halcomb & Davidson, 2006; Rubin & Rubin, 2012). Peer debriefing was introduced to provide support and guidance for data collection and also to increase the credibility of the study (Creswell, 2014; Shenton, 2004; Spall, 1998). The concept contributes to the validation of the findings which includes ensuring that the interpretations are worthy, honest, believable including helping the researcher to note his or her own biases and preferences (Creswell, 2014; Shenton, 2004; Spall, 1998).

Data Analysis Plan

The main purpose of my study was to explore the perception of the Nimo villagers as regards to the risk factors of typhoid fever and the etiology. However, the primary research question that guided the study was: What is the lived experience of Nimo villagers concerning typhoid fever and the factors that contribute to it? To analyze the data, I will introduce a phenomenological approach that will enable to focus on the participant experiences from their perspective or viewpoint concerning the typhoid fever as a disease. And using Moustakas' modified van Kaam method of analysis of phenomenological data that calls for thematizing and clustering; I developed codes and emerging themes from the collected data (Moustakas, 1994; Patton, 2015; Sutton & Austin, 2015). In the process of data collection and analysis, I engaged in bracketing by focusing my thought, beliefs, and any preconceived notions to enable clear my mind concerning the phenomenon of interest (Moustakas, 1994; Patton, 2015). I listened to the

audio recording of the interview and review the transcripts repeatedly before analyzing (Halcomb & Davidson, 2006; Sutton & Austin, 2015). In the process, I eliminated the repetitions and the statements that do not relate to the phenomenon of interest and also note any personal assumptions preconceptions, and biases that I may have (Patton, 2015).

Following this process enabled me to have an open mind and then focus on the respondent's correct perspective concerning typhoid fever as a disease. With the outline and concepts set by LaPelle (2004), Rubin and Rubin (2012), and Saldana (2016), I coded data manually or in other words hand coding by myself and identify the common words, phrases, and statements and group them into themes or categories using Microsoft Word. According to LaPelle, the built-in functions of Microsoft Word is useful and most of the times serves as a better choice for qualitative data analysis (QDA) of data collected from qualitative research that includes key informant interviews which is consistent with my study. However, I was looking forward to incorporating the concepts of Qualitative data analysis software (CAQDAS) such as NVivo with the hand coding for data analysis during the process.

Issues of Trustworthiness

Trustworthiness enables researchers to explain the benefits of qualitative expression used in a qualitative study, and the credibility of the findings which includes interpretations that centers on the application or the attention introduced to build trust (Patton, 2015). According to Shenton (2004), to pursue or ensure a trustworthy study, the four principles of trustworthiness such as credibility, transferability, dependability, and confirmability are reflected or considered in the process. Among the goals or rationale is

to provide validity in the study. Validity in qualitative research centers on the proper or the fair use of tools, processes or procedures, and data to answer a research question or ensure the accuracy of findings (Creswell, 2014; Leung, 2015).

Credibility

This concept centers on the internal validity of the research according to Shenton (2004). To ensure credibility, I introduced triangulation and member check. In triangulation, the goal is to use different method and code from various sources to provide the validity of findings (Creswell, 2014; Shenton, 2004). In member checking, I gave the participants the opportunity to review the transcripts of dialogues to determine the accuracy of the report or discussions in which they participated (Creswell, 2014; Shenton, 2004).

Transferability

The concept relates to external validity which is the extent the findings can be applied to other conditions or in other words generalization (Patton, 2015; Shenton, 2004). To promote the process, I collected a rich description of the participant's experiences for consideration in the utilization of other settings or future studies.

Dependability

The idea of dependability according to Patton (2015) is to ensure that the procedure is logical, traceable, and documented. I validated or ensured this concept through the audio recording and taking field notes to maintain audit trail during the process of study.

Confirmability

The concept is about establishing the genuineness of data to ensure that findings or interpretation are not imagined or merely formulated by the researcher (Patton, 2015). To overcome or avoid this issue from occurring, I also maintained an audit trail that involves taking field notes and audio recording of the interviews which is critical in establishing both dependability and confirmability (Patton, 2015).

Ethical Procedures

I informed the participants of what the study is about, and the purpose for asking for participation to obtain their informed and written consent which I included in the introductory letter (Rubin & Rubin, 2012). The participants were assured that his or her participation was voluntary and it will reflect in the informed consent (Rubin & Rubin, 2012; Patton, 2015).

To protect the participants I adopted the IRB's Office of Research and Compliance on ethical procedures and will store the project data in an electronic format such as Word for the duration of the study. I de-identified the data as soon as was realistically possible to reduce the risk of inappropriate disclosure of personal information. The process includes removing all direct identifiers such as names, addresses, or telephone numbers from the raw data and database. To ensure confidentiality, I took precautions for not disclosing to anyone else any part of the data that is linkable to a participant's identity.

Summary

Typhoid fever is an infectious disease that is a public health concern, and it affects the Nimo community. Knowledge of risk factors or the contributing factors is needed to promote the intervention as regards to preventing and reducing the occurrence of the disease among the residents (Alba et al. (2016). Individuals could change behavior that hinders them from living a healthy life, and it is achievable if they have a full picture of the habits or practice in question (Kinuthia, Gicheru, Ngure, & Kabiru, 2012).

The aim of my study was to utilize a phenomenological method or approach to explore and describe the Nimo residents or villagers' perceptions, practices, and their lived experiences about typhoid fever. A purposeful sampling technique was used to select 15 participants from the community that have a better or sound knowledge and experiences of typhoid fever and meet the selection criteria to answer the research questions. The participants were given informed or verbal and written consent before the data collection. I utilized in-depth qualitative interview that centers on the face-to-face individualized interview in the process and introduced Moustakas's modified van Kaam method of analysis of phenomenological data for the analysis. The study results and the information from it will not only be made available for public health services and the state government in the area for intervention purposes but will also be accessible for further research on the subject matter. In Chapter 4, I will fully explain the data collection, data analysis, data coding and a brief report on the results findings. Finally, Chapter 5 will center on the analysis, conclusions, and recommendations for future research.

Chapter 4: Results

Introduction

My purpose in this qualitative phenomenological study was to contribute additional knowledge to the field of public health and community health education by exploring the perception of the Nimo villagers regarding the risk factors of typhoid fever and the etiology. To guide this study, I introduced one primary research question and developed three subquestions with seven interview questions to answer the research questions. Below are the research questions and the interview questions reflected in Appendix C.

Main Research Question

What is the lived experience of Nimo villagers concerning typhoid fever and the factors that contribute to it?

Subquestions

1. How do living in houses with no water and functioning toilet facilities in Nimo village influence their health behavior related to typhoid fever?
2. How do Nimo villagers describe their knowledge of typhoid fever, hygienic practices, and open defecation practices in relation to typhoid fever?
3. How do daily activities of villagers living in Nimo including sleeping and eating patterns, sanitary conditions affect their health behaviors associated with the infection of typhoid fever?

In this chapter, I will present the results of the study divided into subsections that include the study setting, demographics, data collection, data analysis, evidence of trustworthiness, results, summary, and a brief introduction to chapter 5.

Setting

After IRB approval, I notified the church pastor the site for the interview since I have already gotten permission from the community representatives authorizing the study. The participants did not disclose any personal or organizational conditions that affected their experience during the period of the interview, which could have affected the study findings. One participant pointed out that his father developed dizziness and vomited, which was confirmed by a doctor as a typhoid fever following examination. However, this information did not influence this study in any manner. Excluded from this study were participants that could not read and write in English. Included in the study were individuals that live permanently in any of the Nimo Villages and adults who are 18 years and above that have experienced typhoid fever. All the participants interviewed were able to describe their lived experiences with typhoid fever.

Demographics

The participants for this dissertation study completed demographic questions before the start of a face-to-face interview. The information asked in the form centered on age, marital status, part of the village in Nimo, residence in Nimo whether permanent or not permanent, lives in a house that has tap water. Also, borehole water or no water, lives in a house that has a toilet with water flushing system, pit toilet, or no toilet, level of education, employment status, monthly income range, and contact information. The

demographic questions were utilized not only to determine the participant's eligibility for the study but also to pinpoint those that live permanently in Nimo village the focus of the research. There were 15 participants between the ages of 20 and 71 years and all lived permanently in Nimo, which divided into four quarters; Etiti, Egbengwu, Ifiteani, and Ifite-enu. Below is the summary of the participants' profiles.

Summary of the Participant's Profile

Participant 1 was a 36-year-old male, married, employed from the Etiti part of Nimo, lives in a house that has tap water and a pit toilet.

Participant 2 was a 63-year-old male, married, employed from Ifite-enu part of Nimo, lives in a house with no water, and has a toilet with water flushing systems.

Participant 3 was a 40-year-old male, married, employed from Ifiteani part of Nimo, lives in a house that has tap water and toilet with water flushing systems.

Participant 4 was a 50-year-old male, married, employed from Ifiteani part of Nimo, lives in a house that has tap water and toilet with water flushing systems.

Participant 5 was a 71-year-old male, married, employed from Ifite-enu part of Nimo, lives in a house that has tap water and toilet with water flushing systems.

Participant 6 was 24 years old female, single, unemployed from Ifite-enu part of Nimo, lives in a house that has tap water and toilet with water flushing systems.

Participant 7 was 24-year-old male, single, a student from Etiti part of Nimo, lives in a house that has tap water and toilet with water flushing systems.

Participant 8 was 25 years old male, single, unemployed from Ifiteani part of Nimo, lives in a house that has tap water and toilet with water flushing systems.

Participant 9 was 22 years old female, single, unemployed from Ifiteani part of Nimo, lives in a house that has no water with a pit toilet.

Participant 10 was 22 years old female, single, a student from Ifite-enu part of Nimo, lives in a house that has no water with toilet with water flushing systems.

Participant 11 was 22 years old female, single, student, from Etiti part of Nimo, lives in a house that has tap water and toilet with water flushing systems.

Participant 12 was 20 years old female, single, student, from Egbengwu part of Nimo, lives in a house that has no water with a pit toilet.

Participant 13 was 51 years old male, married, employed, from Ifite-enu part of Nimo, lives in a house that has borehole water and toilet with water flushing systems.

Participant 14 was 58 years old female, married, employed, from Etiti part of Nimo, lives in a house that has borehole water and toilet with water flushing systems.

Participant 15 was 59 years old female, married, employed, from Ifite-enu part of Nimo, lives in a house that has borehole water and toilet with water flushing systems.

Data Collection

I proceeded for data collection after receiving IRB Approval Number 03-18-19-0355439. A total of 17 participants agreed to be part of the study and were confirmed. However, 15 participants were available for interview, and the remaining ones did not show up due to other commitments that came up during the process. The interviews were conducted in a private section of the church premises provided by the pastor lasted between 30 to 45 minutes for each participant. However, it took some of the participants more time to describe their lived experiences with typhoid fever. The data recorded with

a rechargeable digital voice recording device, and I transcribed the audio version of the interview.

The data collection exercise started on June 8 and ended with member checking on June 29, 2019. I made the flyer of the study available before my arrival in Nimo Nigeria, the location of the study from the United States of America to the pastor for the announcement and to post on the church's bulletin board. The goal was for the members to have access to the flyers on Sunday, May 26, 2019, the day of my arrival. I started recruitment efforts on May 27, 2019, when four volunteers contacted me to indicate their interest to participate in the study.

As of June 1, 2019, 12 volunteers expressed interest in participating in the study. The same day I visited the pastor to provide more flyers and to confirm June 8, 2019, as the date to start data collection interviews. Following the visit, five more volunteers called me to express their interest in the study. The initial plan or in order words, the variation in data as presented in chapter 3 was to target sample size of 12 participants for the interview. I scheduled a total of 17 participants due to the interest shown by the villagers to participate and to accommodate the possibility of cancellations. Each participant signed the informed consent and a copy given to each of them. I utilized the interview guide, which had an introduction and seven open-ended questions I developed to help answer my research questions. There were no unusual circumstances encountered during the data collection process.

Data Analysis

After I completed the face-to-face interviews from the study participants, in preparation for data analysis, I organized the data collected. I listened to each interview responses at least three times. This idea was not only to ensure accuracy, but also to fully understand their perceptions as regards to the risk factors of typhoid fever and the causes. I compiled all data from the transcripts that were audio-recorded into Microsoft word document which, according to LaPelle (2004), can be utilized to carry out basic qualitative analysis functions. However, using Moustaka's modified van Kaam data analysis of phenomenological data, I developed codes, themes, and emerging subthemes (Moustakas, 1994; Patton, 2015; Sutton & Austin, 2015). Moustakas's (1994) modified van Kaam data analysis method involves seven steps. This process not only helps the researcher to pinpoint common responses and eliminate answers that do not relate to the phenomenon of interest, but also assists the researcher in coding emerging themes from invariant responses. This process was significant to my study because it helped in making sense of the raw data and also allowed a deeper meaning and understanding of the participant's viewpoint (Patton, 2015; Sutton & Austin, 2015).

I indicated in earlier in Chapter 3 that I will incorporate the concepts of NVivo software with hand-coding for the data analysis. However, I opted to code manually due to some difficulties I encountered with the software. I manually coded each transcript and noted down codes for individuals' responses for each interview question. Participants were assigned P1, P2, and so on which reflected on the interview transcripts, and the themes coded as 2.1, 2.2, and so on. Each participant's responses from the interview were

grouped into themes and coded with numbers as they emerged (Sutton & Austin, 2015). I pointed out, and coded responses that relate to each participant viewpoint as regards to each interview question.

Specific Codes and Themes That Emerged From the Data

The Nimo villagers were asked to describe their understanding and the perception regarding the risk factors of typhoid fever and the causes. Fifteen participants were engaged in a semistructured face to face interview with open-ended questions about their experiences concerning typhoid fever as a disease. The participants' thoughts clustered around seven themes which I obtained from their responses. The final main themes that emerged in the process and as coded are: (2.1) Experience /Knowledge of Typhoid fever (2.2) Hygiene/Clean Practices (2.3) Clean Environments/ Surroundings (2.4) Toileting (2.5) Open defecation, Bushes, Urinating in public places, Eating, and Sleeping on the floor (2.6) Proper hygiene versus water and toilet facilities; and (2.7) Education. Below is Table 1 that indicates the explanation of each major theme while Table 2 shows the seven major themes and 95 subthemes or codes from the study:

Table 1

Theme Codebook

Code	Theme
2.1	Experience /knowledge of typhoid fever
2.2	Hygiene/clean practices
2.3	Clean environments/surroundings
2.4	Toileting
2.5	Open defecation, bushes, urinating in public places, eating, and sleeping on the floor
2.6	Proper hygiene versus water and toilet facilities
2.7	Education

Table 2

Themes and Subthemes

Themes	Subthemes (codes)
Experience /knowledge on typhoid fever	Typhoid fever is attached with malaria
	Is a bacterial disease
	Mosquito bite
	No strength like a wind losing strength
	Taking alcohol
	Black stool (feces), headache, fever, and vomiting
	Sleeping under medicated nets
	Contact with feces
Hygiene/clean practices	What we eat
	Food preparation
	No water
	Working (functioning) toilet
	Water system toilet
	Pit toilet
	Using or drinking water
	Washing hand
	Convenience places
Clean Environments/ Surroundings	Dirty environments
	Village
	Sickness and mosquito
	Sweep
	Water
	Toilet
	Clean and tidy
	Clean Properly
	Urinate
	Prevention
	Nigeria versus Western regions
	Houses, roads, and bushes
Toileting	Pit toilet
	Water system
	Clean
	Cover
	Flies
	Cockroaches
	Flush
	Water
	Odor

	Lack of borehole
	Antiseptics
	Heat
	Bacteria
	Smokes or vapors
	Bush
	Breeze
	Wash our hand
	Some kind of smell
	I have to make use of the ground
Open defecation, bushes, urinating in public places, eating, and sleeping on the floor	Not good to ease yourself inside the bush
	Our system
	Village
	Dangerous
	Safer place
	Emergency
	Water supply
	Clean
	Animal
	Human to human
	Pit toilet
	Comfortable
	Unpleasant odor
	The Floor is very dirty
	Hygienic
	Contact disease
	I do not think sleeping on the floor has anything to do with typhoid fever
Proper hygiene versus water and toilet facilities	Clean water
	Water system
	Infection
	Lack of water
	Pit toilet
	Flush
	Heat coming from the pit
	Water tank
	Where to fetch drinking water
	Wash hands
	Tap water
	Will not have diseases
	Serious problem
Education	Village
	Lack of amenities
	Bore hole and tap water

Prevent typhoid fever
Not educated
Environment and homes clean
Boil water
Stop using pit toilet
Health is wealth
Prevention is better than cure
Cover water
Flush toilet
Awareness
Toilet facilities
Proper use of water

Evidence of Trustworthiness

Credibility

Precautions were taken to ensure that the possibility of a threat to trustworthiness was ruled out during data collection. According to Patton (2015) and Shenton (2004), credibility relates to internal validity, which strives to ensure that the study in question measures what collected or in other words, the respondent's viewpoint. In Chapter 3, I noted that I would introduce triangulation and member check to ensure credibility in the study. However, I opted to utilize only member check and not triangulation since my focus was only collecting and analyzing data from individual interviews. Participants were assumed to have answered all the interview questions willingly without influence, and I asked the same set of demographic and open-ended questions. Notes were maintained to promote clarity of the data collected. To further ensure credibility; in the process of member check, a follow-up interview was scheduled with the participants to check the accuracy of the data and the transcripts of their responses which they participated. The participants were pleased with the content of their answers (Creswell, 2014; Shenton, 2004).

Transferability

Transferability relates to external validity which centers on the issue of generalization of the study and the ability of the findings to be transferred to other situations or one study to another (Patton, 2015; Shenton, 2004). In ensuring or promoting the transferability of this study. I obtained a sample size of fifteen participants that live permanently in Nimo the focus of research, which has a demographic

background of an age that ranges between 20 years and 71 years old. I collected a detailed description of their individual lived experiences through an interview on typhoid fever for the study. The goal was to stimulate future researchers or agencies to build on the research findings for future studies or with a different population.

Dependability

Dependability centers on the process that calls for a study to be addressed in detail and documented to enable future researchers to repeat the same research with a hope of getting the same results (Patton, 2015; Shenton, 2004). Dependability achieved through maintaining audit trails. To ensure dependability in my study, I kept an audit trail which includes an audio recording of the interviews with the participants. I fully documented all the activities that relate to the study in question during the process.

Confirmability

Confirmability, according to Shenton (2004), centers on the procedures taken to ensure that results findings are the experiences and ideas of the participants instead of the researcher's preferences or choice on the phenomenon of interest. As presented in Chapter 3, the ultimate goal was to focus on the genuineness of data to ensure that data interpretations not imagined by the researcher (Patton, 2015). According to Patton (2015), auditing is a significant procedure for establishing confirmability. Therefore, to achieve confirmability, I maintained an audit trail during the study, which includes taking notes of all the activities during the process, and I audio recorded the interviews given to the participants. As a native of Nimo the focus of study, I did set aside my passion and

personal knowledge about typhoid fever during the collection of data throughout the face to face interview process with the participants.

Study Results

Among the seven steps of Moustaka's modified van Kaam data analysis of phenomenological data centers on identifying emerging key themes. Clustering and thematizing invariant constituents as pointed out in Chapter 3 on the data analysis plan. These clustered and labeled constituents, according to Moustakas (1994) are considered the core themes of the experience, which is consistent with my study. The qualitative phenomenological study was done through face to face interviews to find out about the lived experience of Nimo villagers concerning typhoid fever and the factors that contributed to it. The results of participants' responses helped to identify numerous themes and subthemes that emerged, which centered on the central question and three subquestions introduced in the study. The themes and codes that emerged are reflected in Table1 and 2, while the participants' verbatim responses, which include emerging themes as a result of the interview questions are explained in detail below:

Theme 2.1: Experience /Knowledge of Typhoid Fever

The lived experience of adults 18 years, and above in Nimo, a rural community of Anambra state Nigeria regarding typhoid fever assessed through their responses to this interview question: Tell me your experiences with typhoid fever. The codes and theme that emerged from data reveal that the majority of the participants relates or understands their experiences with typhoid fever as connected with malaria infection due to limited

knowledge of the disease. While P12 reported that typhoid fever is a bacterial disease and the infection contracted through a dirty or infected area or toilet. Some of the participants centered their experience on these codes that came out from their responses. Mosquito bite, taking alcohol, sleeping under medicated nets, Contact with feces, black stool (feces) headache, fever, and vomiting. Below are excerpts and verbatim responses that back up this theme:

P1: “Basically I have not separate issues with typhoid except mostly that is attached with malaria fever.”

P2:

> First time I have my experience with typhoid fever is in the year 2004. It all started that I do not know what is happening to me. I was taking it as Malaria and at a stage it continued it was like a wind losing strength. I will eat and eat yet no strength so sometimes in the morning it comes like a fever.

P3: “I experience it when I take alcohol.”

P4: “The stool will be very black and comes out like a stone just like that. I had serious headache.”

P5:

> I suffered typhoid fever but when it started I never knew it was typhoid until I went to certain hospital, since then I have been very careful and presently I cannot remember when I suffered typhoid fever I must be very frank with you because since they started sharing this medicated nets I have been sleeping on under it.

P6: “Initially I was treating malaria thinking it was malaria it was at the end of everything what was being treated continued so I have to go for lab, and when the result came out it was typhoid fever.”

P7: “I contacted it through toilet after the person that used it and left it un-kept.”

P9: “Once it happened it comes with headache, I vomited.”

P12: “I once have typhoid fever last 2weeks; is a bacteria disease got from infected like dirty area or toilet.”

Theme 2.2: Hygiene/Clean Practices

Following the interview question; what is your understanding of hygienic or clean practices concerning typhoid fever? Participants’ responses centered on what they eat and drink. They pointed out that water is needed to ensure proper hygiene or clean practices, which include keeping the toilet clean and washing hand. Codes or subthemes that emerged from their responses from the question were: What we eat, Food preparation, No water, Working (functioning) toilet, Water system Toilet, Pit Toilet, Using or drinking water, Washing hand, and Convenience Places. Below are verbatim responses from the participants:

P1: “Starting from where we live, followed by what we eat, where we live and prepare our food might be so dirty that from there we can contact something.”

P2:

> I discovered that we don’t have water, everybody takes anything inform of water because it has been called water, the one we use in drinking, the one we use in

cooking, the one we use in washing food items we eat most of them are got from the rain because we don't have borehole, we don't have pipe-borne water.

P4:

The time my typhoid started we do not have a working toilet. After that incident we put on water system we clean all the time washing hand, anything you do wash hand with soap to make sure we don't contact anything.

P5:

The only problem there is that we are using Pit toilet then in as much as you are trying to avoid the oozing out of the waste; is unavoidable anyway. But presently where I am living we have water system though I am using an overhead tank which I normally fill it when it gets empty.

P6: "We have to be conscious of the kind of water we take. They said the best water to take is bottled water but some people who cannot afford bottled water can boil water. And again after using the toilet you wash your hand very well."

P7:

To avoid yourself from typhoid fever requires going to toilet in a convenience places, like having your own personal toilet and if you cannot afford your own personal water system toilet, you can have it in the bush that is a more convenient place than using a public road.

P9: **"**Once someone is clean there is nothing that will make the person contact typhoid fever. Like someone will got to toilet and come back the person may wash his hands or clean his hands."

P11: “Based on that they said that health is wealth and someone being hygienic is more preferable. The water you are using is well sterilized, you abstain from illness.”

P13: “The thing that causes typhoid fever is sometimes you use to be in a very dirty environment like if you come to a place where there is no natural water or pure borehole water and sometimes some of the water we use causes symptoms.”

P15: “This place is a village and so many people find it difficulties to wash their hands properly. There is a way of washing hands but we have not understood it.”

Theme 2.3: Clean Environments/Surroundings

A subsequent question that centers on environments or surroundings asked: What is your understanding of clean environments or surroundings in relation to typhoid fever? Codes that came out from the participants' responses were similar to the previous question the centers on hygiene. However, some of the participants focused on the description of their environments as it relates to typhoid fever. Codes that summarized their responses that associates with the theme character are; dirty, sickness and mosquito, sweep, clean properly or tidy, urinate, prevention, Nigeria versus western regions, houses, roads, and bushes. The verbatim responses indicated below:

P1:

> Typhoid is an infection which we can contact from dirty environments or dirty foods that we eat. So my understanding is that we need to have a very clean environment in order not to have that particular infection called typhoid fever.

P3: **"**When my environment is very clean and well treated so nothing like sickness or mosquito will live around that place. And when my environment is dirty the mosquito that brings the sickness like malaria and typhoid will come out."

P4: "My understanding is that it is good to clear environment to avoid infection"

P6:

> The environments you are staying you have to make sure is clean sweep it all the time be conscious of water you take and the kind of food you take and again mostly is the toilet, after going to toilet make sure we wash our hands.

P7: "Through the process you can contact the typhoid fever. So keeping the environment clean is the most or main thing that you can use to avoid the bacteria infection."

P8: "Clean environment is a situation where you clean every part of your surroundings to make sure they are clean and tidy. Do not allow dirty things, don't urinate anyway you like in the compound."

P10: "When you have clean environment you cannot have typhoid fever"

P11: "Clean environment is very good. They say prevention is better that cure so when you prevent all those dirty areas or sometimes what you take in will be harmful to our body"

P13:

> What I understand with clean environments is that you cannot compare or quantify Nigeria with the western regions where you have every facility. In Nigeria we don't have such a conducive area. Some of the places we live we find out that sometimes to keep those place tidy enough is very difficult like when go

> to gutters that is where people put their refuse instead of putting it in a normal place where they are supposed to put and they are putting it anywhere, those things can cause typhoid as well.

P14: "Clean those houses, roads, and everywhere in the compound when they are clean we may not get such diseases much."

P15:

> Normal circumstances one has to clean properly the environments, sweeping, keeping it clean, and your plates. Then the bushes around have to be clean; when you come into certain compounds you see children they will pass feces all over. Packing it is a problem they don't have a specific place to defecate so these things are problems.

Theme 2.4: Toileting

Interview question to the participants that fall under this theme category asked: Tell me your experience or explain how you toilet (defecate or easy yourself). Participants' description of their experiences centered on the type of toilet facilities such as pit toilet they use due to lack of water. Some of them pointed out that they use antiseptics to keep the toilet clean and reduce the number of flies going inside the pit toilet. However, some of the participants indicated that they prefer water systems than pit toilet systems toilets. Codes derived from these theme category or their responses included: Pit Toilet, Water System, Clean, Cover, Flies, Cockroaches, Flush, Water, Odor, Lack of borehole, heat, and Antiseptics. Also, included are Bacteria, Smokes or

Vapors, Bush, Breeze, Wash our hand, some kind of smell, and I have to make use of the ground. The verbatim responses reflected below:

P1: “In my home we have pit toilet but we always clean it, wash it, cover it so that flies and cockroaches might not go there and also get in contact with the feces inside the pit and the foods we eat.”

P2: “The toilet facilities we have are because we don’t have water. We don’t flush sometimes you defecate and leave it there and move forward because of the problem of water. The toilet is a water system but no water.”

P4: “We don’t have borehole water. We have water tank and we go to toilet we use antiseptics.”

P5: “The water system is more hygienic in the sense, that you try to clean up from time to time looks neater but the pit toilet sometimes when you want ease yourself you notice that heat is coming out from that very Pit toilet.”

P6:

> We have pit toilet before we now started using water system. When we are using pit toilet we found out that everybody mess it up which may be after the person might defecate on top and without even washing it then you can easily get those bacteria but when you have water system you can flush down everything so I prefer water system to pit toilet.

P7: “I do flush it before I ease myself there. Sometimes you go to public toilet, you see something like smokes or vapors coming from the inside pit toilet, I try to avoid it. I can’t easy myself there rather I use the bush but I do like water system.”

P8:

> When we are still using a pit toilet, when I go there I will see something like coming out of the toilet at times I sit down there and defecate but I hardly go there due to that smoke coming out from the pit toilet so that made me started going to the bush a times.

P9: “I go inside the bush to use the toilet because sometimes if you go to that pit toilet you will see breeze come outside the pit and that may cause bacteria.”

P10: “We have water system after using it you flush it so that you cannot get typhoid. We have no borehole but we go outside to fetch water to flush and wash our hand”

P11:

> In my place now we are using toilet water system before I use it I will like to flush it first, then after easing myself I now use wipes and if is not available I can use tissue to clean myself. After that I flush it. Sometimes I use detergents to wash the toilet and sometimes I use hot water to dilute it; is having some kind of smell.

P12: “Like in my house we have pit toilet, I don’t make use of the pit toilet, I have to make use of the ground then after I put it in the toilet because I am a woman and I don’t want to get infected by bacteria.”

Theme 2.5: Open Defecation, Bushes, Urinating in Public Places, Eating and Sleeping on the Floor

Following the interview question which asked the participants to explain their understanding of going inside the bushes to ease their self or toilet, urinating in public

places, eating and sleeping on the floor affects hygienic or clean practices, and conditions of environments or surroundings. Some of the participants, through their response, perceived these practices as a normal practice in the village that cannot be avoided. While others viewed it as dangerous, a safer or comfortable place in terms of utilizing the bushes or public places to defecate. The most common responses as coded were: Not good to ease yourself inside the bush, Our System, Village, Dangerous, Safer Place, Emergency, Water Supply, Clean, Animal, Human to human, Pit Toilet, Comfortable, Unpleasant odor, The floor is very dirty, Hygienic, Contact disease, and I don't think sleeping on the floor has anything to do with typhoid fever. The following are responses from the participants that reflect these characteristics:

P1:

> Well is not good to ease yourself inside the bush or any other environments around, but the circumstances warrants that and is not mostly intentional because those places you urinate or defecate are dirty. People urinate and defecate which attracts flies and they may contact typhoid fever. It is not proper for someone to urinate in public places and defecating in the bush, sleeping and eating on the floor. It is due to our system.

P2:

> In that aspect we are in the village, people urinate anyhow, and once the rain comes it flushes the flood carries it here and there inside our compound, people defecate even in the bush, and those people that don't have toilet, they must have to go to toilet so most times they go to the bush around the buildings, they

defecate around the bushes and around the buildings, and they ease themselves wherever it pleases them.

P3:

My experience in going to the bush to ease myself and the public toilet or any public area is that where people went and ease themselves is very dangerous but some people enjoys it and sees it as a safer place. Because breeze are blowing everywhere, when you go there to ease yourself, your anus are not safe, your body are not safe, all your body are open. You can contact anything there. So it is very dangerous.

P6:

Easing yourself outside or the bushes it can affect the water supply may be those people around that area is using tap water or other kind of water, if you defecate near those places it affect the people using the water in area. And in the public toilet, it is not advisable to use public toilet because you don't know how clean those people keep it you don't even know if they use disinfectant after other people have used it so it is really advisable not to use public toilet. Then eating and sleeping on the floor. Well, it all depends on the surroundings how neat the surroundings is, if it is in rural area like in my area now, I know that we keep our surroundings clean like in my house we keep our surroundings clean we make sure we clean at least 3 times in a week so it pertains in area where by those people don't keep their surroundings clean they can easily contact typhoid.

P7:

My little understanding is from the bush. Once I went to the bush, the bacteria you cannot contact it from any animal it is just from human to human. So I see myself in the bush as a safer place and I do avoid lying on the ground.

P8:

Going to bush to easy myself, I like going there for reasons then we are still using pit toilet, I feel comfortable there. There are kind of breezes you get from there. Then eating on the ground, sometimes we eat on the ground like sit down on the floor start eating sometimes the food will fall off the ground you will pick it up and started eating it again and the urinating in public places is not good because it gives unpleasant odor and it causes harms to our breathings.

P9: "Urinating in public places, I don't think is good. People may contact typhoid fever from those areas. And I do eat on the floor."

P10: "When you go to bush to ease yourself you may contact typhoid or infection or when you sleep on the ground you may have a typhoid cold."

P11:

Going inside the bush is okay as the cause is because of emergency if there is no other available place for you to easy yourself. You can easy yourself there but for me I cannot just bend and easy myself to avoid contacting bacteria. Public toilet, I don't normally use public toilet rather I will just hold myself until I reach where I am going. I had experience of sleeping on the floor, it affects my lungs. The floor is very dirty even after it is scrubbed it is dirty.

P12:

I will start by going inside the bush to urinate, there is no how you can get bacteria, like now we are in rainy season everywhere is dirty in the bush you will get bacteria sometimes typhoid. Then sleeping on the ground like now the rainy season also there will be cold, and I think that will also make you have typhoid fever. Then urinating; as a woman you have to make sure that where you are urinating is clean because if it is not clean you will get the bacterial like typhoid or any other infection. You have to make sure that the place you are urinating, defecating, and sleeping is kept hygienic.

P14:

Going inside the bush, for me I did not like it at all. Going inside the bush to ease yourself like that, I did not prefer it because you may contact more disease there. And for sleeping in the floor like me if I sleep on the floor my heart will be paining me sometimes I will get cold and also you can get pneumonia for sleeping on the floor. And I don't think sleeping on the floor has anything to do with typhoid fever.

P15:

It affects it because there are a lot of diseases we contact by those toilets we have in the bushes. After toileting or urinating when there is rain it will be carried with floating water and that may leads to disease. And the flies perching on feces and moving around it has no boundary will be moving around to perch on anywhere it sees. And perching on it is leading to illness.

Theme 2.6: Proper Hygiene Versus Water and Toilet Facilities

Participants were asked to describe how the basic amenities such as water and functional toilet facilities, influence their experiences and daily life in maintaining proper hygienic or clean practices. Most of the participants stated that lack of water and not having clean water, which mostly comes from rainfall or wells in the form of a borehole for proper washing hands and for flushing toilets for those who have water system toilets contributes to their unhygienic behavior and the tendency of contracting diseases. Codes derived from their responses are Clean water, Water system, Infection, Lack of water, Pit Toilet, Flush, Heat coming from the pit, Water Tank, Where to fetch drinking water, Wash hands, Tap water, Will not have diseases, and Serious problem. The participants' responses presented below:

P1:

> When you use clean water, tap or bore hole you will know that you are very well protected from most of waterborne diseases. But using rainfall water and other water from wells are not hygienic because they might have infection inside it. When using a water system toilet; is very hygienic and very good. Have to flush it every time you use it to keep it clean.

P2:

> The greatest problem we are having is because we don't have water, before you get water you can go for a distance before you get the water to drink the water to cook, the water to wash, and to keep the environment clean and the toilet. So water is our major problem. Then the environment too because we don't have

water it affects every aspect of our living because you need to take your bath, but when you don't have water anything goes, then washing our cloth and the rest of them, because we don't have water. The toilet facilities are not there and even the one that are there no water to flush, then most people uses the pit toilet, and those people that don't have pit toilet, they go into the bush."

P3:

I use pit toilet, when I leave that environment, I started using water system. I experience nothing like flies. But when I go to pit toilet you experience something like heat coming from the pit but on the water system you don't experience those things we try to keep it neat.

P4: "We use our own water tank and we make sure that the water tank is clean. We use water for everything. Even when you want to urinate, you carry water."

P6:

This basic amenities is very important because most people their source of water is mostly rain water like in my house our source of water is rain. We have very big tank. Like in this village now places to fetch water is few. Most times you cannot even find where to fetch drinking water because other water we are using is rain water, we use it to bathe and flush toilet. But for drinking water most times especially during the December period, you find it difficult to see where you can buy a drinking water and you know most people cannot afford sachet water all the time.

P8:

> In respect to that it does not help me to maintain good hygiene. Because now we have changed to water system and the type of cleanliness we are suffering from there, we are no more suffering from it again. And in water, we always boil water we drink every morning we boil water and pour it into the flasks so we leave it to cool off and from noon we start using it.

P9: "My experience is that if I go to toilet and I did not flush is because of no water, and I cannot wash my hand if I urinate."

P11: "Clean water does help in maintaining good hygiene. With clean water you cannot contact any bacteria and eating a very good food, foods that flies will not perch on to avoid contacting infection."

P12: "Like the pit toilet, if your family is clean they also have to keep the toilet clean no matter if it is pit or water system. Then as in water we use if it is covered properly or after using it you leave it open then it can be contaminated by the bacteria."

P14: "If waters are not clean enough, the hygiene cannot be okay."

P15:

> I have the experiences of going into people toilet something like water system and if you don't have enough water is a serious problem. Serious illnesses will be contracted because it will not be flushed and even when it is flushed it will not be well flushed. But when you have enough water it you can use it wash your hands when it is supposed to be washed, clean the place when you are supposed to even the environment of that area, it has to be well cleaned because of the presence of water but when there is no water it is a serious problem.

Theme 2.7: Education

The final interview question asked to explain or communicate anything else that may help to increase my understanding of their lived experiences with typhoid fever. While P1 related his experience on none availability or access to some of the amenities needed in the village such as borehole water or tap water which may limit the infection of typhoid fever. Some of the participants centered their responses on the need to educate the residents on hygienic practices such as boiling water before drinking and keeping homes clean. Other participants pointed out the need to create or educate on the awareness of typhoid fever. That includes the significance of keeping the toilet facilities clean and proper use of water such as washing hand. Following the participant's responses in this question, education developed as a theme. The examples of the codes derived from their responses are; Village, Lack of amenities, Borehole and tap water, Prevent typhoid fever, Not educated, Environment and homes clean, Boil water, Stop using Pit toilet, Health is wealth, Prevention is better than cure, Cover water, Flush toilet, Awareness, Toilet facilities, and Proper use of water.

P1: “In the village is not all that easy to have some amenities. If there is bore hole and tap water it will help to prevent contacting typhoid fever from the water side.”

P2: “Most of our people here are not educated. Because of the facilities around they don’t practice the hygienic aspect of life.”

P3: “In our village we are living in a rural area not in urban area so we lack so many things here. We change our environment put it in order, clean our areas, and keep it clean.”

P6:

I will like to add like these basic amenities; water is very important. And the type of food we take, the type of food we buy outside most especially fruits and vegetables, is good to peel yourself before eating them, and boil water before you drink them."

P8:

What I am going to add is this; on pit toilet we have to find a means to do away with the pit toilet because for instance like flies and other insects always sit there later on they came back to the kitchen to perch on the food or fruits we are using. So to me I suggest that we should do away with pit toilet and start using water system because when you urinate it flushes immediately and keep it clean.

P11:

Health is wealth; when someone is very healthy there is no need to have illness. When you prevent all those things that will make you fall sick I don't think you will fall sick, so prevention is better than cure.

P12:

Typhoid fever has to be avoided sometimes it kills if it is not taken proper care of. You have to cover your water properly, if you have to lie in the ground, you have to put clothes or mattress. Then the toilet if you are using pit toilet you have to make sure you close it very well also use disinfectant. If you are using water system, you flush very well and close every time.

P15:

> I don't have much to say but sensitization or creating awareness to people about typhoid fever and other illness by informing them on how to keep the environment clean, how to wash their hands, how to maintain their toilet facilities, avoid dropping feces all over and trying to make use of water properly.

Summary

Participants were allowed to respond to the seven open-ended interview questions concerning their perceptions on the risk factors of typhoid fever and the causes. Their responses provided answers to the primary research, and three subquestions presented and discussed above. Most of the participants related their lived experience with typhoid fever with malaria and alcohol, as a result of limited knowledge on the causes of typhoid fever as a disease. However, some of the participants pointed out that some unhygienic practices, such as not washing hand properly after toileting due to lack of water and dirty environments are the primary causes or the risk factors of typhoid fever. Some of the participants detailed their experiences with symptoms of typhoid fever, such as headache and fever. Other participants saw the need to create an awareness of typhoid fever as a disease in the village and to educate them on the hygienic practices such as boiling water before drinking, hand washing, and keeping homes, environment or surroundings that includes toilet facilities clean.

After manual or in other words, hand-coding and utilizing the Moustakas's modified van Kaam seven steps method of data analysis, I developed themes and codes from the participants' verbatim transcripts of responses. These codes and themes, as presented in Tables 1 and 2, produced an understanding of their lived experiences, which

helped to provide answers to the research questions. In Chapter 5, I present and discuss the interpretation of findings, provided the limitations of the study, described recommendations for further research, described the implications of social change, and provided the conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

My purpose in this qualitative phenomenological study was to contribute additional knowledge to the field of public health and community health education by exploring the perception of the Nimo villagers regarding the risk factors of typhoid fever and the etiology. Data from this study could provide new insights to help the policymakers in the region, the public health services, and the NGOs introduce measures. The goal will be to educate on the impacts of the disease and a policy decision for the provision of essential amenities such as toilet facilities and portable or borehole water in the community.

Analysis of the interview data reviewed the seven themes associated with participants' perception of the risk factors of typhoid fever and the causes. The themes include Experience /Knowledge of Typhoid fever, Hygiene/Clean Practices, Clean Environments/ Surroundings, Toileting, Open defecation, Bushes, Urinating in public places, Eating, and Sleeping on the floor, Proper hygiene versus water and toilet facilities, and Education. During the data collection process, a participant stated that he has no separate experience with typhoid fever but connected to malaria. Another participant said that he experienced typhoid fever when he takes alcohol. These responses confirmed limited knowledge on the causes or risk factors of typhoid fever. However, on education, one of the participants stressed on the importance of creating awareness to people about the disease by educating the villagers on how to keep the environment clean and maintain proper hygienic practices such as hand washing. The responses from these

individuals were among the significant or critical findings of the data collection exercise or experience.

Interpretation of the Findings

Seven questions guided the research to answer the research questions and as a result the lived experiences of typhoid fever that centers on knowledge and risk factors or causes were given by most of the participants. While some of the participants related their experience with "taking alcohol and mosquito bite," one participant said "attached with malaria fever" and others said "headache, fever, contact with feces, and no strength," other participants stated that typhoid fever infection is as a result of dirty environments and unhygienic behaviors or conditions.

Theme 2.1: Experience/Knowledge of Typhoid Fever

Most of the participants understood that their experiences with typhoid fever connected with malaria and alcohol. The following subthemes derived from the participants' responses: Typhoid fever is attached with malaria, is a bacterial disease, mosquito bite, taking alcohol, sleeping under medicated nets, Contact with feces, black stool (feces) headache, fever, and vomiting.P1 believed that his issue with typhoid fever is as a result or connected to malaria and P3 attributed his infection or experience with typhoid fever when he takes alcohol. These responses revealed a limited or gap in knowledge on the causes or risk factors of typhoid fever, which may promote the infection in the area. Researchers such as Alba et al. (2016), and Wain et al. (2015) agreed. According to the researchers, knowledge may affect an individual's perception

related to maintaining proper hygienic practices associated with a condition such as typhoid fever the focus of this study.

However, one of the participants responded that typhoid is a bacterial disease and pointed out the toilet facility or feces as among the sources of the bacteria that causes the infection. This finding supports the notion of Shukla et al. (2014) and WHO (2018). The researchers explained that typhoid fever is a bacterial disease as a result of Salmonella typhi, usually from food or water. These contaminated by carriers such as flies from the feces or urine of infected people.

Theme 2.2: Hygiene/Clean Practices

Participants responded extensively on their understanding of the hygienic or clean practices related to typhoid fever. The subthemes taken from their statements are: What we eat, Food preparation, No water, Working (functioning) toilet, Water system Toilet, Pit Toilet, Using or drinking water, Washing hand, and Convenience places. The participants firmly believed that lack of water in the community affects their hygienic behavior. Because they need water not only to drink but to use in washing their hands and the foods they eat. One of the participants stated that they do not have access to bore-hole water or pipe-borne (portable water), which impacts their ability to ensure proper hygienic practices. Another participant said that people have to be conscious of the kind of water they take. According to the participant, the best water to take is bottled water, but pointed out that some people cannot afford bottled water. These findings confirmed the view of Mogasale et al. (2016) and WHO (2018). The agency and the researchers pointed out that typically typhoid fever is predominantly found in the area where water is

limited or lack of clean drinking water. Clean water and availability are needed to ensure proper hygienic or clean practices.

Other participants' response or understanding centered on washing their hands adequately. One of them pointed out that the community is a village. Not only that people find it difficult to wash their hands properly, but they do not know or understand the right procedure. This finding supports what Alba et al. (2016), Dewan et al. (2013), and Greenwell et al. (2013) said about hand washing and hygiene concerning typhoid fever. According to Greenwell et al., understanding the motivating factors for routine hand washing is needed for a behavior change or in other words, to maintain proper hygienic or clean practices. However, Alba et al. and Dewan et al. further explained that personal or individual hygiene includes washing hands periodically during the day with soap. According to the researchers, the process is considered a robust protective factor for typhoid fever.

Theme 2.3: Clean Environments/Surroundings

Participants shared their understanding of clean environments or surroundings with typhoid fever. The subthemes were dirty, sickness and mosquito, sweep, clean properly or tidy, urinate, prevention, Nigeria versus western regions, houses, roads, and bushes. The participants stated that dirty environment contributes to the infection of typhoid fever. They also pointed out that their understanding of the reason or a clean environment is to avoid contracting a disease. One participant stated that his knowledge of clean environment "is a situation where you clean every part of your surroundings to make sure they are clean and tidy. Do not allow dirty things, don't urinate anyway you

like in the compound."Another participant fully described his understanding of the clean environment concerning typhoid fever as:

> What I understand with clean environments is that you cannot compare or quantify Nigeria with the western regions where you have every facility. In Nigeria, we don't have such a conducive area. Some of the places we live, we find out that sometimes to keep those place tidy enough is very difficult like gutters are where people put their refuse instead of putting it in a normal place where they are supposed to put, and they are putting it anywhere, those things can cause typhoid as well.

All of the participants considered dirty environments as a result of waste materials such as feces found inside compounds or surroundings as a factor that promotes typhoid fever infection. These findings support the views of Akullian et al. (2015) and Greenwell et al. (2013). According to Greenwell et al., untreated or abandoned waste in rural areas such as Nimo increases the risk of typhoid fever. Akullian et al., revealed following their study that environmental transmission of typhoid fever contributes to the risk of disease, especially in children as a result of playing outside where fecal materials mostly found due to dirty environments.

Theme 2.4: Toileting

Participants centered their experiences on toileting or the process they pass through during defecation or easing themselves by utilizing the water system and pit toilets. The subthemes were*:* Pit toilet, water system, clean, cover, flies, cockroaches, flush, water, odor, lack of borehole, antiseptics, heat, bacteria, smokes or vapors, bush,

breeze, wash our hand, some smell, and I have to make use of the ground. Some of the participants pointed out that they have water systems, but in most cases, do not have water to flush the toilet after defecating or urinating. A participant stated that water system toilet is considered more hygienic and when clean is better than a pit toilet. Most of the participant revealed that the issue with the pit toilet is that when someone wants to toilet the person will notice heat and smoke coming out from the pit hole. One participant explained that in their house, they have a pit toilet but does not use it. Instead, she will defecate on the ground and put the feces inside the pit toilet to avoid infection with bacteria.

One of the participants revealed that they have a pit toilet in their home but keeps it clean by washing and covering it. According to the participant, the idea is to stop flies and cockroaches from making contact with the feces inside the pit and perching on the foods they eat. These findings validate the viewpoint of researchers such as Akullian et al. (2015), Dewan et al. (2013), and Shukla et al. (2014). According to them, typhoid fever infection occurs due to exposure of fecal materials of infected people as a result of transportation by both humans and flies. This notion or factor is consistent with the experience of Nimo villagers.

Theme 2.5: Open Defecations. Bushes, Urinating in Public Places, Eating and Sleeping on the Floor

Participants were asked to describe their understanding of open defecation that involves going bushes and urinating in public places. Also included is the idea of eating and sleeping on the floor affecting hygienic or clean practices and conditions of their

environments or surroundings. The findings revealed that while most participants viewed these practices or the conditions of their environment as a contributing factor to the infection of typhoid fever. Others see it as an unavoidable or a normal routine due to the system in place whereby individuals can urinate or defecate where they feel comfortable. The following are subthemes derived from their responses: Not good to ease yourself inside the bush, Our System, Village, Dangerous, Safer place, Emergency, Water supply, Clean, Animal, Human to human, Pit toilet, Comfortable, Unpleasant odor, The Floor is very dirty, Hygienic, Contact disease, and I do not think sleeping on the floor has anything to do with typhoid fever.

One of the significant statements from a participant centers on urinating and defecating outside or in the bushes. The participant revealed that the water supply of those around the area, such as borehole or tank water could infect with bacteria that causes typhoid fever as a result of the practice. Another participant stated that it is not suitable for someone to easy themselves inside the bush or any other environments and that it is not proper to sleep and eat on the floor. He further stated that when people urinate or defecate, it attracts flies that the contact may cause typhoid fever. In general, the participants believed that it is the conditions of the villagers' environment, and their understanding promotes the behavior. However, a participant revealed that he likes going inside the bush to defecate instead of using a pit toilet they have.

A participant succinctly stated that

> In the village, people urinate anyhow, and once the rain comes it flushes the flood carries it here and there inside our compound, people defecate even in the bush,

and those people that don't have a toilet, they must have to go to the toilet so most times they go to the bush around the buildings, they defecate around the bushes and around the buildings, and they ease themselves wherever it pleases them.

These findings support the notions of Greenwell et al. (2013); and Shukla et al. (2014) as regards to the risk factors of typhoid fever. Shukla et al. highlighted changes in the cumulative density of habitat characteristics. Plant and vegetation in the communities, open drainage, garbage dumps or waste materials provide a healthy environment for breeding, growth, and survival of carriers such as flies which promotes the spread of typhoid fever. Greenwell et al. pointed out that frequent flooding as a result of rainfall, sanitation, and hygiene infrastructure contributes to the spread of the disease.

Theme 2.6: Proper Hygiene Versus Water and Toilet Facilities

Participants stated various ways of basic amenities. Such as water and functional toilet facilities influence their experiences and daily life in maintaining proper hygiene or clean practices. The subthemes were: Clean water, Water system, Infection, Lack of water, Pit Toilet, Flush, Heat coming from the pit, Water Tank, Where to fetch drinking water, Wash hands, Tap water, Will not have diseases, and Serious problem. Most of the participants stated that the lack of water is the main issue that affects their hygienic practices because they need water to flush toilets. A participant said that when someone uses clean water, tap or bole hole water that it protects the person from contacting waterborne disease. Another participant responded that before getting water that he travels to a long distance. The participant said that he needs water to drink, cook, wash, and to keep his environment and toilet clean. A participant stated that clean water helps in

maintaining excellent or proper hygiene. Because it is utilized to clean the food that flies perched on before eating to avoid contacting infection such as typhoid fever. One of the participants stated that water impacts everything they do in the village that includes their daily life. The participant said:

> Water is our major problem; then the environment too because we don't have water, it affects every aspect of our living because you need to take your bath, but when you don't have water anything goes, then washing our cloth and the rest of them because we don't have water toilet facilities are not there and even the one that is there no water to flush, then most people uses the pit toilet, and those people that don't have pit toilet, they go into the bush.

This finding confirms what Dewan et al. (2013) and Kanj et al. (2015) reported on the significance of safe water and proper hygiene with typhoid fever. According to Kanj et al., typhoid fever is a waterborne disease associated with poor hygiene. Dewan et al. indicated that typhoid fever is more prevalent in areas. Such as where water is limited, or that lacked the provision of safe drinking water, inadequate sanitation, and the quality of life is poor.

Theme 2.7: Education

The participants' response when asked if they have anything else that will help to increase the understanding of their lived experiences and their responses centered on their concerns and education: For example, basic amenities that include water to limit the infection of typhoid fever and to educate the villagers on the disease by creating awareness and ways to prevent it. The subthemes emerged are: Village, lack of

Amenities, Borehole and tap water, Prevent typhoid fever, Not educated, Environment and homes clean, Boil water, Stop using Pit toilet, Health is wealth, prevention is better than cure, Cover water, Flush toilet, Awareness, Toilet facilities, and Proper use of water. Most of the participants expressed the importance of having amenities. For example, borehole or tap water and functioning toilets, which helps to prevent the contamination of bacteria that causes typhoid fever, and others focused on education and creating awareness on the disease.

A participant suggested abolishing pit toilets due to the issue of flies that carries the bacteria, which causes typhoid fever. The participant further suggested introducing water system toilet that flushes because it tends towards being clean. Another participant concentrated on letting people know about the disease. The participant stated:

> I don't have much to say but sensitization or creating awareness to people about typhoid fever and other illness by informing them on how to keep the Environment clean, how to wash their hands, how to maintain their toilet facilities, avoid dropping feces all over and trying to make use of water properly.

This finding supports what Greenwell et al. (2013) and Mogasale et al. (2014) pointed out on the impacts of the scarcity of basic amenities and health education with typhoid fever. Greenwell et al. reported that health education that centers on environmental adaptation behavior, such as benefits, or the advantage of hand washing is useful in the prevention of typhoid fever. Mogasale et al. stated that the result or the consequences of inadequate sanitation and lack of basic amenities, which includes safe water and toilet facilities is typhoid fever.

Limitations

There were several limitations present in this study. First, a sample of 15 participants (*N*=15) utilized may not represent the entire population of Nimo communities perceptions within the villages regarding the risk factors of typhoid fever and the causes. This factor contributed to the inability of the study to be generalized. Another factor is that Nimo has four quarters: Etiti, Egbengwu, Ifiteani, and Ifite-enu. The goal was to select relatively in these areas to provide the needed information. However, only one participant from Egbengwu was available for the study, which may have also impacted the generalization.

I utilized a purposeful sampling method in this study to select participants that have better knowledge and experiences of typhoid fever and meet the selection criteria. Among the requirements was the ability to read and write in English. Many of the Nimo residents may have experienced or known about the disease. But cannot read or write in English, and this criterion may have deprived the participants who may have a different and multiple life experiences from the study. In which their responses could have added additional credibility to the study findings.

I introduced semi structured and standardized open-ended interview questions for the study. The goal is to increase the comparability of responses. The idea is for the participants to respond according to their choice. However, all were subjected or limited to the same questions. This limitation may have deprived the participants who may have diversified or varied life experiences with typhoid fever infection the opportunity to tell their stories.

Finally, another limitation centers on the bias, which mostly found in a phenomenological qualitative study. To avoid potential personal bias, I bracketed my expectations that include thoughts and beliefs. I recorded and transcribed the actual responses of the participants from the interview concerning their perceptions of typhoid fever risk factors and causes.

Recommendations

This study and its findings revealed several directions and actions needed to promote or limit the infection of typhoid fever in the area. There is a need for the Nimo 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. Participants' responses to the study interview questions showed a lack of knowledge and awareness of typhoid fever. This study is a first study to seek the lived experiences of the villagers. Therefore, I recommend further research or investigation that will relatively represent the four quarters of the community on the extent of their knowledge and the factors that are contributing to the disease. The study would be beneficial to the residents.

In the effort to promote or introduce a typhoid free environment, the participants' belief or perception was that health education that centers on awareness of the disease and the prevention would help to achieve the objective. The participants made it clear that in addition to having water available in the community, they will need water system toilet and not a pit toilet. These basic amenities enable maintaining and practicing proper hygienic methods. As a result, the study findings further collaborates or aligns with

previous researches such as Alba et al.(2016), Dewan et al. (2013), Kinuthia et al.(2012), Lee et al.(2013), and Thompson et al.(2014) on the prevention of typhoid fever. These researchers not only highlighted that prevention of typhoid fever requires improved or clean water, toilet facility, sanitation infrastructure, and proper hygiene practices, but also they indicated that health education and awareness programs on the disease are needed.

To address the lack of typhoid awareness, considering the notion of Kinuthia et al. (2012) on individuals' habits which prevent someone from living in the best possible health. Tend to change when they have a clear or full understanding of the practices in question. I recommend in collaboration with the public health agency and the schools in the area to develop a community-driven health educational outreach awareness program. This intervention will not only provide information on the risk factors and the etiology of typhoid fever but would also address the unhygienic practices that contribute to the disease. An example could be developing or creating an educational brochure. The document could highlight the benefits of hygienic conditions such as frequent hand washing with soap and food safety practices in the prevention of typhoid fever.

To address the issue of sanitation infrastructure and the conditions of the environment, I recommend a better sanitation infrastructure that includes proper disposal of waste materials or human feces, improving the conditions of the environment that include inside and outside the houses. This procedure can be beneficial to the children who are at a higher risk of exposure to typhoid fever from environmental sources (Akullian et al., 2015). Public health in the state and other stakeholders in the area such as NGOs, can help to achieve this intervention. The goal or idea is to provide portable or

borehole water and to build or introduce functional toilet facilities in the community. The provision of these amenities may deter individuals from defecating in public places such as the bush. I recommend including or explaining the impacts of eating and sleeping on a dirty floor of the house with typhoid fever on the educational materials or brochure for the awareness program.

Implications

The results of this study have implications for positive social change for the community. The participants revealed their perceptions of the risk factors and the etiology of typhoid fever. The significant social change implication that came out from this study is education on the awareness of the diseases that centers on proper hygienic and sanitary practices. The provision of essential amenities, such as water and toilets facilities, is needed to promote or maintain adequate hygiene and sanitary practices. These factors or amenities are required to limit the contamination of bacterial infection that causes typhoid fever.

Among the implication is for the community to increase their understanding of typhoid fever. The findings indicate that there is a need for the residents to increase their knowledge of the disease. Intervention is required within the population to improve their understanding of the mode of transmission of typhoid fever. The idea is to empower the people to take control of their lives in maintaining proper sanitation and hygienic practices. Understanding or knowing the risk factors and etiology of the disease is critical in achieving this goal within the population.

The study findings advocate or suggest these aspects of positive social change, which enables the community to improve their lives and have a typhoid fever disease-free environment. According to Alba et al. (2016), Jung-Seok Lee et al. (2016), and Lee et al. (2013), prevention of typhoid fever does not only require knowledge of the risk factors and their importance in relation to the disease for developing effective health education but also needs clean water, a proper sanitation infrastructure, and hygiene practices.

Typhoid fever prevention educational programs would introduce the awareness of the causes and the risk factors of the disease to the community. The awareness would help the perception of the disease to increase knowledge on the risk factors and how their behavior or lifestyle promotes the infection, which impacts the health of the community. This intervention supports the notion of Kinuthia et al. (2012). The researchers pointed out that good health leads to development and that a healthy population or in other words, without disease is productive. They further explained that individuals tend to change their habits, such as not practicing proper hygienic practices. The community can achieve this thought if they have an understanding or knowledge of the adverse impacts of their actions.

The premise of this study calls for limiting the disease in the area centers on the theoretical framework of HBM and EM. To change behaviors, according to Glanz et al. (2015), depend on perceived susceptibility, perceived severity, perceived benefits, and perceived barriers of the disease, which relates to HBM. EM focus is on the nature of people's interaction with their physical and sociocultural environments (Glanz et al., 2015). This factor promotes education on healthy choices when the situation is not

supportive or adequate such as sanitary condition which is consistent with the findings of this study.

Another implication or a potentially positive social change for this study is that it can be useful evidence or a reference point for decision making. The policymakers in the state government or the public health services in the region, including the stakeholders within the community and the NGOs can utilize the findings. The primary goal should be to formulate or tailor the right interventions to the residents. The process could involve educating on the impacts of the disease and the provision or facilitate the needed essential basic amenities, such as water and toilets for the villagers or the population.

Conclusion

This study was conducted to contribute additional knowledge to the field of public health and community health education by exploring the perception of the Nimo villagers regarding the risk factors of typhoid fever and the etiology. Following data collected from the participants, the study findings revealed health disparity within the community as a result of deplorable environments, limited understanding of the risk factors of the typhoid fever, inadequate hygienic practices, and essential materials such as water. There is a need to increase the knowledge of the disease and the provision of necessary amenities. This intervention could be significant in the villagers or the population pursuit for proper hygienic or sanitary practices that are needed to have a typhoid fever-free environment or limit the disease in the area. The intervention is required within the community to improve their understanding of the mode of transmission of the disease. The knowledge could empower them to take control of their lives in the effort to achieve the objective.

However, according to Enabuele and Awunor (2016), typhoid fever is considered endemic in Nigeria, and burden centers mostly in the rural region of the country like Nimo community the focus of the study. The perception is that it may be challenging to have a disease-free population. The notion of success in limiting the disease centers on the theoretical concept of HBM and EM. HBM acknowledged the significance of individual perceptions of the disease in question, such as typhoid fever during an intervention. The EM suggests that the outcome of the interaction with peoples' physical and socio-cultural environments leads to educating and promoting or changing towards healthy behaviors. These factors are consistent with study findings or in order word the focal point or essence of this study.

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Appendix A: Recruitment Flyer

Seeking Participants for a Research interview to Help Improve the Educational Awareness, Knowledge, and Prevention of Typhoid Fever in Your Village

How You Can Help

- Share Your Experiences with Typhoid Fever
- Share Your Knowledge of the Risk Factors or Causes of Typhoid Fever
- Describe Your Understanding of Hygienic Practices and Environmental Sanitation Associated with Typhoid Fever

Eligible Participants: Who is needed?

- Individuals living Permanently in any of the Nimo Villages
- Adults who are 18 years and Above that has Experienced Typhoid Fever
- Ability to read and write in English

To sign up and for more information on how to participate:

- Contact George Ilouno- the researcher (Phone----------)
- Provides incentive with a gift of a prepaid calling card

Appendix B: Demographic Questions

Background information:

1. Age----------
2. Marital status---------- (a) Married (b). Single (c). Divorced
3. Part of your village in Nimo ----------(a) Etiti Nimo (b) Egbengwu Nimo (c) Ifiteani Nimo (d) Ifite-enu Nimo.
4. Residency in the Nimo Village---------- (a) Permanent, (b) Not Permanent
5. Lives in a house that has----------(a)Tap water (b) Borehole water (c) No water
6. Lives in a house that has----------(Toilet with water flushing systems (b) Pit toilet or latrine (c) No toilet
7. Level of education---------- (a) Did not attend any school (b) Did not complete school (c) Completed primary school (d) Completed Secondary school (e)University degree or diploma (f) Post graduate degree
8. Employment status---------- (a) Student (c) Employed (d) Business
9. Monthly income range----------
10. Contact information

    Name----------

    Address----------

    Phone Number----------

Appendix C: Interview Questions /Guide

Interview Guide: Perceptions, Practices, and Risk Factors Associated With Typhoid Fever in Nimo Village Nigeria

1. Tell me your experiences with typhoid fever?
2. What is your understanding of hygienic or clean practices in relation to typhoid fever?
3. What is your understanding of clean environments or surroundings in relation to typhoid fever?
4. Tell me your experience or explain how you toilet (defecate or easy yourself)
5. Tell me your understanding of going inside the bushes to ease yourself or toilet, urinating in public places, eating and sleeping on the floor affects hygienic or clean practices and conditions of environments or surroundings?
6. Describe how the basic amenities such as water and functional toilet facilities influence your experiences and daily life in maintaining proper hygienic or clean practices.
7. Is there anything else you want to discuss or communicate with me that help to increase my understanding of your lived experiences with typhoid fever? Also, will it be okay to contact you if needed for any clarification on the information provided?