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Consumer Health Information Needs, Seeking and Searching Behavior By Rural Residents in the Kachia Grazing Reserve, with a Focus on Vector-borne Diseases

Musa Dauda Hassan
University of Wisconsin-Milwaukee

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CONSUMER HEALTH INFORMATION NEEDS, SEEKING AND SEARCHING
BEHAVIOR BY RURAL RESIDENTS IN THE KACHIA GRAZING RESERVE, WITH A
FOCUS ON VECTOR-BORNE DISEASES

by

Musa Dauda Hassan

A Dissertation Submitted in
Partial Fulfilment of the
Requirements for the Degree of
Doctor of Philosophy
in Information Studies

at

The University of Wisconsin-Milwaukee

December 2019

ABSTRACT

CONSUMER HEALTH INFORMATION NEEDS, SEEKING AND SEARCHING BEHAVIOR BY RURAL RESIDENTS IN THE KACHIA GRAZING RESERVE, WITH A FOCUS ON VECTOR-BORNE DISEASES

by

Musa Dauda Hassan

The University of Wisconsin-Milwaukee, 2019
Under the Supervision of Professor Wolfram Dietmar, PhD

Information is considered the basic material for making decisions. People from all walks of life have information needs for business and personal use. Consumer Health Information (CHI) is an emerging form of information made accessible to the layperson. It is a simplified form of information from the types of information available to medical professionals. This study examines the health information behavior of the residents of one region in the Kachia Grazing Reserve (KGR) located in the North West of the six geopolitical zones of Nigeria. This dissertation explores the health information needs, seeking and searching behavior of the residents of selected communities that are affected by two vector-borne fly diseases in Nigeria. Insects such as flies are responsible for the transmission of diseases to humans, including trypanosomiasis, caused by the tsetse fly, and malaria, caused by mosquitos. These flies are commonly found in and affect mostly rural dwellers in Nigeria. This study investigates some of the broader contextual issues that may influence consumer health care needs as well as seeking-searching behavior. It asks participants whether they believe their health information needs are being met or not. The study applied a qualitative approach sampling 50 adult participants. It relied on a triangulation data collection method using a questionnaire, interview instrument, and focus group discussion. NVivo version 12 was used in the data analysis to create a coding scheme following the stages of open, axial, and selective coding processes to develop a grounded theory of rural residents' information behaviors. The findings of the research revealed

various health information needs and seeking behavior the rural residents engaged in; it also revealed the factors that influenced their seeking and searching activities. Furthermore, the findings highlighted the information sources they used, and the problems associated with the information-seeking and searching process. The model that was inductively derived from the grounded theory data analysis explains further in detail the strategies and processes members of the community use in their health information-seeking and health-searching behavior.

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Dedicated to

my late parents Dauda Hassan/ Ramlah Musa and
especially my family: Hajara, Haleemah, Abdulhaleem, and Ramlah

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ANHCS	Annenberg National Health and Communication Survey
ARV	Antiretroviral
ASK	Anomalous State of Knowledge
AT	Animal Trypanosomiasis
AU	African Union
BMHI	Biomedical Health Information
CHI	Consumer Health Information
CHO	Consumer Health Organization
CIS	Cancer Information Services
CWA	Cognitive Work Analysis
DC	District of Columbia
ECDC	European Center for Disease Control
EMR	Electronic Medical Record
EU	European Union
FGD	Focus Group Discussion
GT	Grounded Theory
Glo	Global Network Mobile
HAT	Human African Trypanosomiasis
HIV	Human Immunodeficiency Virus

ICT	Information Communication Technology
IR	Information Retrieval
IRB	Institutional Review Board
ISB	Information-seeking Behavior
KGR	Kachia Grazing Reserve
MDG	Millennium Development Goal
MNEC	Model Nomadic Education Centre
MTN	Mobile Telecommunications Network
NGO	Non-Governmental Organization
NITR	Nigerian Institute for Trypanosomiasis Research
NPC	National Population Commission
PCR	Pennsylvania Cancer Registry
PEW	A family name (not an acronym) the four children of Joseph Newton Pew
PI	Principal Investigator
PLWHA	People Living with HIV and AIDS
RQ	Research Question
QDAS	Qualitative Data Analysis Software
SPI	Student Principal Investigator
STD	Sexually Transmitted Disease
SNS	Social Networking Site
US	United States
U.K.	United Kingdom

U.N.	United Nations
UNDP.	United Nations Development Project
USA	United States of America
USD	United States Dollar
UWM	University of Wisconsin-Milwaukee
VVF	Vascular Vaginal Fistula
WHO	World Health Organization
WWW	Word Wide Web

MOST FREQUENT KEY TERMS/WORDS AND THEIR MEANING

AIDS: acquired immunodeficiency syndrome, a disease that damages the immune system.

Cancer: a disease in which abnormal cells divide without control and affect tissues.

Consumer Health Information: online health information available to users in simplified form.

Dengue: a viral fever caused by the dengue virus, resulting in body fever, body ache, bone pain, eye pain, rashes, etc.

Diabetes: a disease that affects the body's ability to produce or use insulin, which is a hormone.

HIV: human immunodeficiency virus. It affects the body's immune system.

Hypertension: a disease of high blood pressure that may eventually lead to health problems, such heart disease.

Information need: recognition of inadequate knowledge to satisfy a goal.

Information searching: a process people undertake to locate or retrieve specific information to meet an information need.

Information seeking: a process of searching and locating information by identifying print or online sources of information.

Kachia Grazing Reserve: a livestock reserve area located in the Northwest part of Nigeria.

Leprosy: a mildly infectious disease that damages the small nerves on the skin surface, resulting in a loss of sensation.

Malaria Filariasis: a blood disease caused by a parasite transmitted to humans through the bite of the Anopheles mosquito.

Mosquito: a dipteran fly that sucks blood from humans and animals.

Naira: name of the currency used in Nigeria.

Onchocerciasis: an eye and skin disease in humans caused by a parasitic worm (microfilariae) in an insect called a black fly.

Rural Dweller: residents of the communities who live in villages that lack a basic infrastructure.

T brucei brucei: a species of parasite of the genus Trypanosoma transmitted by the tsetse fly.

T brucei cruzi: a species of parasite of the genus Trypanosoma transmitted.

T. b. gambiense: a species of parasite of the genus Trypanosoma transmitted by the tsetse fly.

T. b. rhodesiense: a species of parasite of the genus Trypanosoma transmitted by the tsetse fly.

Trypanosomiasis: a disease caused by a microscopic parasite transmitted by the tsetse fly.

Tryps: short form of Trypanosomiasis.

Tsetse fly: blood-sucking insect commonly found in tropical regions, especially in sub-Saharan Africa.

Vector-borne diseases: infectious diseases transmitted between humans or from animals to humans by blood-sucking insects.

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CHAPTER 1

Overview and Context of the Research

1.1 Introduction

Information is considered the basic material for making decisions. People have information needs for business and personal use, from the highly-educated person to the ordinary person (Ahmed, 2016). Consumer Health Information (CHI) is a form of information made accessible to patients regarding health; it is used by a lay person, so it is simplified from the types of information available to medical professionals (Stavri, 2001). The availability of CHI has been increasing dramatically over the last 20 years and is not just sought out by patients with a given condition. As Mackay observed: “Everyone is a consumer of health information because it includes information on specific illness and conditions, on good health and the prevention of illness” (Mackay, 2000, p. 69). Similarly, consumers, caregivers, and professionals have been found to engage in interactive health information-seeking via the Internet (Cline & Haynes, 2001). This behavior had been commonly practiced because consumers find that online medical information, posted by sites such as Medline and Healthfinder.gov, is written by actual doctors and other medical personnel, and is trustworthy (Eysenbach, 2003; Gregory-Head, 1998; White, 2002).

The user’s need to find information varies substantially from patient to patient (Eheman et al., 2009) and is connected to numerous need factors and searching behaviors among health consumers. A health need is viewed as the drive to seek and receive primary care (Mathers, Vos, & Stevenson, 1999).

People seek health information in response to the environment they are in (Brashers, Goldsmith, & Hsieh, 2002). Health information behavior is part of a broader process of health communication, emphasizing the transactional quality of information-gathering activities (Cline & Haynes, 2001). This study investigates some of the broader contextual issues that may influence health care needs and seeking search behavior and asks participants if they believe their health needs are being met. The investigation intends to propose and develop a model of how the rural community residents in Nigeria find and locate health-related information.

1.2 Scope and Rationale of the Study

This study investigates the health information needs, seeking and searching behavior of several communities that are particularly affected with selected vector-borne fly diseases in Nigeria. Vector-borne diseases, such as trypanosomiasis and malaria, are spread by organisms that transmit infectious diseases between humans or from animals to humans by a blood-sucking insect (ECDC, n.d.; WHO, n.d.-b). This study examines six communities located in the Kachia Grazing Reserve (KGR) in Kaduna state located in the North West of the six geopolitical zones of Nigeria. (Olatomiwa, Mekhilef, & Ohunakin, 2016). The area includes communities such as Wuro Nyko, Nassarawa, Wuro Fulbe, Wuro Modi, Wuro Saleh, Tilde Bayero, Mayo Borno, Mayo Jamil, Mayo Ardo, Mayo wuse, and Ladduga, which form the six blocks of the Kachia Grazing Reserve (Ducrotoy et al., 2016a; FNC Enwezor et al., 2009; Waters-Bayer & Taylor-Powell, 1986). The Ladduga Kachia Grazing Reserve was selected because it represents a rural area that has problems with trypanosomiasis and malaria, as confirmed by numerous studies. Furthermore, KGR is categorized as a rural setting in Nigeria that lacks some basic facilities that urban areas possess. Furthermore, grazing research has a great economic importance to the national agricultural and

livestock production in Nigeria (de Leeuw & Magaji, 1978; Ducrotoy et al., 2017; Ducrotoy et al., 2016b).

Nigeria is located in West Africa ($9^{\circ}4'N7^{\circ}29'E/9.067^{\circ}N7.483^{\circ}E$), bordering the Gulf of Guinea between the Benin Republic on the West, the Niger Republic on the North, Chad on the East, and Cameroon at the South Atlantic Ocean. Nigeria has a compact area of 923,768 square kilometers (356,376 square miles) and is slightly more than twice the size of California, or the size of California, Nevada, and Arizona combined. The country is made up of six geopolitical zones, with a total of 36 states and the Abuja federal capital territory. The estimated population is difficult to estimate, although it remains the most populous Black nation on Earth, with a total of 182 million people, according to the current estimate of National Population Commission of Nigeria (NPC). The NPC projects that the country's population will rise to 210 million by the year 2020 (National Population Commission, 2006; *Nigeria Millenium Development Goals MDGs*, 2015; UNDP, 2012).

The population density in Nigeria is among the highest in Africa, ranging from 1000 people per square kilometer in the North East and West Central to more than 500 people per square kilometer in the Southern and North West regions. The Nigerian population consists primarily of adults aged between 18 and 65 years (53%), with children from birth to age 14 comprising the second-largest group (44%). Children are further divided by gender, and there are more boys (27,181,020) than girls (26,872,317). Individuals over the age of 65 in Nigeria comprise about 3%, and gender representation is roughly equal, with 1,722,149 males and 1,722,349 females (UNDP, 2012).

The majority of Nigerians still live in rural areas. The data on rural dwellers in Nigeria reveal that over 75% of the population lives in poverty. This group lives largely ignorant about disease, has a high rate of illiteracy, and lacks basic infrastructure such as good roads and electricity. There is a lack of institutions of higher learning (Momodu, 2002). Because of this poverty, development is of key interest, but the meaning of rural development has been a subject of much debate and little agreement. The definition may be centered on an income criterion, with an attempt to address the problem of rural poverty and through development and through improved health education and nutrition. Development can also be seen as an ideology and practice (Olayiwola & Adeleye, 2005).

Iwe (2003) defines the rural area in the Nigerian context as a place where residents are far from the urban city college; the rural area is a village, a hinterland with no good access roads, no pipe-borne water, no electricity, or any development-oriented enterprises such as factories. The rural dwellers are mostly farmers and artisans whose population is comprised of elderly residents and other people who live in poor and deprived conditions, lacking the basic necessities of life (Aninweze, 2004). As if those in this region do not have enough difficulties to deal with, some flies that serve as vectors for diseases, like the mosquito, tsetse fly, and black fly, are found in great numbers in these areas. These are the flies that transmit malaria and trypanosomiasis. Such diseases disproportionately affect poor, developing countries, especially their rural areas (Lancet, 2010).

Studies confirm that most of the above-mentioned diseases are found mainly in rural areas in Nigeria and occur frequently (Abegunde et al., 2016; Babamale & Ugbomoiko, 2016; Janssens et al., 2016; Mphande, 2016; Odikamnoro & Ikeh, 2016; Solomon, 1993; Uba et al., 2016; Weber

et al., 2019). In addition to infecting people, the diseases infect animals, which then adds to the problems faced by rural dwellers. Pests put constraints on agricultural production because they impact the free areas where animals graze, which in turn yield lower calving rates and lower milk production. Furthermore, the flies' effects are more severe during politically unstable periods during which time control measures that help to some degree, such as the application of pesticides, are neglected (Brun, Blum, Chappuis, & Burri, 2010; Swallow, 2000).

Due to the complications of village poverty, combined with the effects of the flies that serve as disease carriers, learning more about how people find and use consumer health information is of great importance. People increasingly can find and use consumer health information due to several critical changes in society, including the development of information technologies such as the Internet, and the rapid changes that have occurred in the health care environment (Masur, Kaplan, & Holmes, 2002). Research indicates that more interest has developed in consumer self-health care information-seeking (Brashers et al., 2002; Cline & Haynes, 2001; Kouame, Harris, & Murray, 2005; P. A. Marshall, 2006; Shepperd, Charnock, & Gann, 1999; Smith, 1998).

The rural areas where the majority of Nigerian people live have been largely overlooked in research activities, and the area of sociocultural determinants of health-seeking behavior of rural dwellers has received scanty attention (Osubor, Fatusi, & Chiwuzie, 2006; Wagstaff, 2002). Furthermore, the issue of health information-seeking behavior relating to rural women, in particular maternal mortality in Nigeria, is one of the most neglected research areas. This study investigates the information needs, seeking and searching behaviors of residents of several communities that are affected with selected fly-based vector-borne diseases in Nigeria. Similarly,

recent studies show that such diseases are predominantly found in rural areas in Nigeria and constitute the highest frequency of occurrences (Abegunde et al., 2016; Babamale & Ugbomoiko, 2016; Janssens et al., 2016; Mphande, 2016; Odikamnoru & Ikeh, 2016; Solomon Ngutor, Idris, & Oluseyi Oluyinka, 2016; Uba et al., 2016).

Consequently, information consumers have been found to engage in one way or another in information seeking, especially for health information (Fox, 2013a; Fox & Duggan, 2013; Priest et al., 2016). For this reason, everyone is considered a seeker and user of information as part of the everyday activities of human life. These activities include health, entertainment, agriculture, finance, etc. (Johnstone, Bonner, & Tate, 2004). Consumers need and use health information in many different ways, either directly or indirectly, such as passive information retrieval from the media or active information-seeking and searching, either by an individual, a caregiver or relative. When a person has a direct need for health information, he or she will seek it out in many ways. These include making an inquiry for information related to health care, such as asking medical personnel like doctors or midwives, or by using other health information sources, including obtaining information online (Yusup & Komariah, 2014). This information can be critical. As Sharma and Fatima (2012) note, providing good access to quality information will obviously help rural dwellers fight against superstitious beliefs and help them become more effective in helping themselves and others.

While medical information is helpful and can be essential to everyone, Zijp (1994) noted that rural dwellers have limited information access and often cannot locate what they need to know. Rural people do not always know what their information needs are, how they can meet these needs, and where they can go for the required information. This is why understanding what information

people need and how they go about trying to find the information is critical (Ahmed, 2015). Some of the problems rural dwellers in Nigeria may encounter in health information-seeking and searching could be a lack of basic education and/or illiteracy, a lack of Internet and/or devices to access the Internet, and/or a lack of access to health facilities and qualified personnel.

1.3 Statement of the Problem

Insects are responsible for the transmission of some diseases to humans, including trypanosomiasis, malaria, dengue hemorrhagic fever, and onchocerciasis. It is estimated that about 250 million people are impacted worldwide, with the greatest burden of these diseases occurring in sub-Saharan Africa, representing 80% of the cases (Matthews, 2011). Vector-borne diseases such malaria are caused by parasites that transmit disease through the bite of infected female insects. Anopheles mosquitos are responsible for the global burden of parasitic and infectious diseases. Mosquitos are vectors of malaria filariasis and dengue, as well as yellow fever. The most severe mosquito-borne diseases are often found in areas that have heavy rainfall, which permits larvae to breed. About 3.2 billion people, almost half of the world's population, are at risk of contracting malaria; sub-Saharan Africa carries the highest number of global malaria cases. The World Health Organization (WHO) reported in 2015 that this region accounted for 90% of malaria cases and 92% of malaria-related deaths. WHO also reported that 70% percent of the deaths of children under 5 years of age in this region were malaria-related. More than 100 countries are still affected by malaria, including Nigeria (WHO, n.d.-a).

Furthermore, the tsetse fly is another vector-borne disease carrier of great economic importance; it causes the trypanosomiasis infection. Trypanosomiasis is an infectious disease occurring in humans and animals of similar etiology and epidemiology. The human form of

African trypanosomiasis, commonly known as “sleeping sickness,” is found in some African nations, including Nigeria. The same disease is called “Chagas disease” in South America but is caused by a different subspecies of *Trypanosoma* parasite and relies on a different insect as the transmission vector. Trypanosomiasis is caused by two subspecies of *Trypanosoma brucei*: *Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense*. *Trypanosoma brucei*, a third subspecies, is only infectious to animals. *Trypanosoma brucei gambiense* is responsible for the chronic form of sleeping sickness in West and Central Africa, whereas *Trypanosoma brucei cruzi* and *rhodesiense* have permeated East Africa, Southern Africa, and Latin America.

Trypanosomiasis is widespread. Kuzoe (1993) estimated that over 50 million people might be infected. Though the disease is common in the area, fortunately research in the field has improved due to new diagnostic tools that are simpler to use, provide vector control, and are used at the community level. The WHO reported that about 25 countries in Africa, including Nigeria, had cases of the transmission of trypanosomiasis; however, the exact method for tracking the actual occurrences has yet to be identified. It takes time to confirm cases of “sleeping sickness”; it is estimated that 65 million people are at risk.

Vector-borne diseases caused by tsetse flies are generally found in and affect mostly rural dwellers in Nigeria. Lancet (2010) stated that such diseases affect poor, developing countries, especially in rural areas. Grazing animals can be affected by trypanosomiasis, caused by the tsetse fly, which reduces their calving rates and decreases milk production in affected animals. This, then, has a financial impact on poor herders, who are already financially at risk.

The divide between urban and rural areas can be critical in information access and information-seeking behaviors. In many countries, particularly in Africa and Asia, the majority of

people who live in rural areas have different information needs from the people who live in urban areas. Cheunwattana (1998) concluded that there is not much empirical data about rural information needs and information-gathering behaviors by residents of rural communities. Obviously, these fundamental questions remain unanswered; empirical research in this area is needed to illuminate our understanding of the current state of rural information services and devices to better approach information service delivery. Furthermore, Chester and Neelameghan (2006) noted that a large percentage of the population of rural communities in Africa is not adequately supplied with the required information it needs. However, this lack of information is not the only problem affecting rural communities; scholars generally agree that rural communities in Africa invariably lag behind in terms of meaningful economic development, including the access to information (Camble, 1994; Correa et al., 1997; Dawha & Makinta, 1993; K. Mchombu, 1995; Okiy, 2005). Rural dwellers may lack the basic health infrastructure and social amenities to facilitate an adequate living condition. They must contend with the major problems of poverty, ignorance, disease, a high rate of illiteracy, and a lack of basic infrastructure such as good roads, electricity, education system, industries, potable water. These problems may cause the community to develop a culture of silence, resignation and docility as result of being isolated from development and especially access to basic health information. Rural residents encounter barriers to health care that limit their ability to obtain the care they need for good health care. As a result of the demand for more health-related information, people especially in rural areas are relying on access to consumer health information. However, there has been a lack of understanding of the processes used by communities in rural areas seeking information. It is against this background

that the researcher decided to conduct research around the problem of rural community access to health information in Nigeria.

Therefore, lack of access to the right information for rural communities adds to the problems that hinder their development. To gain insight in the health information needs and seeking behaviors of rural residents in Nigeria, this study investigates the following questions:

1.4 Research Questions

RQ 1 What are the health information needs of rural residents in the Kachia Grazing Reserve, Nigeria?

RQ 2 a. Which factors influence, or trigger, rural residents' health information needs in the Kachia Grazing Reserve, Nigeria?

b. How do these factors impact the ways rural residents seek and search for health information?

RQ 3 What are the health-seeking and -searching behaviors of rural residents of the Kachia Grazing Reserve, Nigeria, who are affected by vector-borne diseases (transmitted by mosquitos and tsetse flies)?

RQ 4 What are the barriers rural residents encounter in addressing their health information needs and their seeking and searching behavior?

1.5 Significance of the Study

According to Julius Nyerere, former president of Tanzania, "While other countries in the world aim to reach the moon, we must aim for the time being at any rate to reach the villages by providing them with necessary information" (Kamba, 2009, p. 3). In fact, access to the right information by rural communities can help community members acquire skills and build up

knowledge and confidence to contribute fully in community affairs. The right information can help eradicate ignorance and provide enlightenment on how to achieve the educational, social, political, and cultural objectives to improve entire communities (Islam & Ahmed, 2012). Information brings about knowledge, and through knowledge the community can better develop itself.

Kamba (2009) noted that a community can only become knowledgeable if community members recognize and use information as their tool for development. Kamba's study aimed to identify the information needs and information-seeking strategies among the community members infected with fly-based, vector-borne diseases, because health care seeking is the primary objective; defined in its broadest sense, it relates to health care access, service use, and the way in which people respond to their perceived ill health (Ahmed, Adams, Chowdhury, & Bhuiya, 2000).

The current study focuses on ill health and disease, as the literature shows there is little impetus to act in developing countries unless an individual is ill (Atkinson, Saperstein, & Pleis, 2009; Msiska et al., 1997). Therefore, the findings of the study provide an insight into our understanding of consumer health information searching behaviors (Zhang & Wolfram, 2009). The findings are expected to expose the urgent need to better serve the information needs of rural dwellers in Nigeria, the methods used to find such information, and the barriers that prevent rural dwellers being able to find what they need. This study aims to develop a model that will help to identify the types of health information needs that rural community dwellers have, identify the sources they use, and understand the information-seeking behaviors in which they engage. This study will also help determine the awareness rural dwellers have about diseases and propose solutions to some problems they encounter in the health information-seeking process. This study will also be of benefit to government officials and policymakers in order to address the issue of

proper planning and implementation of their development policies in the communities. Finally, the study will open a new chapter on the scholarly understanding of rural dwellers' information needs and seeking behavior by serving as a reference tool for further investigation of the areas affected, and for providing a foundation for further studies. Furthermore, the study reviews literature, theories and models of information behavior and its application in a different context which will contribute to the understanding of how rural people engage in health information-seeking and searching behavior. This qualitative study uses a triangulation method using questionnaires, interviews and focus groups and proposes a model that could provide direction for future studies for how rural communities in Africa, particularly Nigeria, engage in health information behaviors.

CHAPTER 2

Literature Review

2 Introduction

This chapter presents a literature review, setting a foundation for this dissertation research, which focuses on the information needs as well as the seeking and searching behavior for consumer health information among the rural residents in the Kachia Grazing Reserve (KGR), Kaduna State, Nigeria. It is paramount to set forth an introductory discussion about the concept of information needs, as well as seeking and searching behavior and to clearly explain the significance of information to rural communities. This chapter also covers the existing research on the information needs and the seeking and searching process of rural dwellers in developing and developed countries. It also narrows the scope of the discussion by highlighting some of the literature on information needs and the information-seeking and -searching behaviors of rural dwellers in Nigeria.

In addition, the chapter explores theoretical models that are used to study general and health information needs and information-seeking and -searching behaviors on health-related topics. It concludes by discussing the literature that addresses consumer health information needs as well as seeking and searching in the environment the proposed study will address.

2.1 Underlying Concepts

2.1.1 The Concept of Information

Defining “information” is difficult because information itself is not a tangible object. However, we often choose to record information in paper or virtual form. Because information can be in many different forms, Case (2012) defines information as an individual’s sensory stimuli, his

or her mental representation of the act of problem-solving or decision-making. Case describes information as how we think and learn new ideas, as well as our state of mind. Information includes the process of communication and the judgment about what is and is not relevant about additional information to add to one's mental views on the subject. This implies that we study information in its content form and record it in numerous ways, including in object form, such as a book or document.

The study of information is, therefore, very complex, because parts of it are mental, other parts are tangible, and still others are virtual. Buckland (1991) agrees that the idea of information is not just the tangible parts of information; information includes the idea of information as a process and the way a human considers the information. In this way, Buckland considers information as knowledge that can be passed on through data or documents or even orally, whether through a recording or an in-person conversation. Similarly, Bateson (1971) defines information as something that makes a difference in a human's conscious mind, enlightening them about what they do not know. In other words, information can make us more knowledgeable, and this is why information is related to knowledge.

2.1.2 Information Needs, Seeking and Behavior

Information needs, seeking and behavior represent significant areas of study within information science. Extensive studies, theories, and models exist regarding the need for information, how individuals seek information, and how individuals behave while seeking this information. Because each individual is different, this field of study involves considerable variety. After all, one's information needs are subjective, and what complicates this even further is that these needs occur in a person's mind (Wilson, 1997). Furthermore, information need refers to a

human's recognition of existing knowledge that is inadequate to fulfill the need; it also refers to a situation in which a person has a goal to achieve, yet there is a gap in knowledge about how to achieve that goal. Therefore, information scientists must not only try to capture an individual's idea of a need for information (which may or may not yet be able to be articulated clearly) but be able to explore the moment when the person realizes that the information currently available in his or her mind is lacking.

Once individuals realize this information is lacking, they look for information; "information seeking" refers to the conscious effort to acquire information to fulfill the gap of missing knowledge. Taken as a whole, then, "information behavior" covers information-seeking as well other unintentional or passive behaviors (such as glimpsing or encountering information) as well as purposive behaviors that do involve active information-seeking (Case, 2012). As mentioned before, much of this process is in a person's mind, so researchers must find ways to help the person being studied to explain his or her thoughts. According to Choo et al.(2000), information behavior can be divided into three sub-categories: information needs, information seeking, and information use. A person's cognitive mindset and information needs can generate uncertainty and anxiety, which will lead them to the process of information-seeking (Choo et al., 2000).

2.1.3 Information Need

Belkin (1982a) stated that information need can refer to the gap between what a person knows and does not know, or to an Anomalous State of Knowledge (ASK) (Belkin, 1980). Similarly, Dervin stressed that an information need is a bridge or cognitive gap that occurred during a situation where a person/user could not move forward until they bridged that gap with

knowledge (Dervin, 1999). Bigdeli (2006) defines information need as an area of specialization with distinction; various other factors may determine the information-seeking behavior of an individual or a group of individuals. These include the purpose for which information is being required, the environment in which the user operates, the user's skill in identifying the information, and the sources preferred for acquiring the needed information. Furthermore, information need, as defined by Chowdhury (2010), is a vague phenomenon; it may arise when an individual recognizes that their current state of knowledge is insufficient to address the task at hand or in order to resolve or bridge some knowledge gap. Also, Belkin (1982a, 1982b) explained information need as a gap between what we know and what we need to know or as an anomalous state of knowledge.

2.1.4 Information-Seeking Behavior

Krikelas (1983, p. 6) defined information-seeking behavior "as any activity of an individual that is undertaken to identify a message that satisfies a perceived need," or a "purposive acquisition of information from selected information carriers." Similarly, information-seeking behavior is the activity that arises as a consequence of a need to achieve some goal. In the course of seeking, the individual may interact with manual information systems, such as a newspaper or a library, or with computer-based systems, such as the World Wide Web (Gann, 1991; Johnstone et al., 2004). Also, Marchionini (1997) stated that information-seeking is associated with learning and problem solving, while Peterson and Merino (2003) state that information-seeking requires the use of knowledge, but the difference is that learning demands retention, while information-seeking is used to complete a task.

Furthermore, according to Vakkari (1999), information-seeking is a process of searching, obtaining, and using information for a purpose when a person does not have sufficient prior

knowledge. Ramirez et al. (2002, p. 217) defined interpersonal information-seeking as “the pursuit of desired information about a target.” Kuhlthau (2004) saw information-seeking as a learning process; she claimed people seek information to broaden their understanding of the world, and that information-seeking is a primary activity of life.

Moreover, Kakai (2004) defined information-seeking behavior as an individual way and manner of gathering and sourcing information for the person’s use. He contended that information-seeking is a broad term that involves a set of actions that an individual take to express information needs, seek information, evaluate and select information, and, finally, use this information to satisfy his/her information needs. Similarly, information-seeking behavior refers to the way people search for and utilize information as activities indulged in and manifested through a particular behavior (Kakai et al., 2004). Also, information-seeking is undertaken to identify a message that satisfies a perceived need (Wright & Guy, 1997). Correspondingly, Ikoja-Odongo stated information-seeking may be actively or passively done when taking steps to satisfy a perceived need (Ikoja-Odongo, 2008). Similarly, Kingrey (2005) revealed that information-seeking refers to the process that involves the search, retrieval, recognition, and application of meaningful content.

2.1.5 Information-Searching Behavior

Information-searching behavior, as compared with information-seeking behavior, is the micro level of behavior employed by the searcher during interactions with information systems of all kinds. It consists of all the interactions with the system, whether at the level of human-computer interaction (e.g., use of mouse and click on link) or the intellectual level (e.g., adopting a Boolean search strategy or determining the criteria for deciding which of two books selected from adjacent

places on a library shelf is most useful). It also involves mental acts such judging the relevance of data or information retrieved (Wilson, 2000).

Information-searching behavior is described as the totality of human behavior in relation to sources and channels of information, including both active and passive information-seeking and information use. Thus, it includes face-to-face communication with others, as well as the passive reception of information, as in watching TV advertisements, without any intention to act on the information given. The active process of the information needs demonstrated by users influences their search behavior (Elkerton & Williges, 1984), and the task complexity greatly influences user searching behavior (Large, Beheshti, Breuleux, & Renaud, 1994).

2.1.6 Factors Influencing Information Needs

One factor that can impact an information need is the location in which the search is carried out. In fact, often the context and specific search environment become deeply linked in search studies. The environment includes the physical location as well as the people, things, and natural elements occurring in and around that place, while context is more the broad search category, such as “medical practices” or the “university setting.” The environment can impact the information need in a variety of ways as well as the way the information is sought. For example, the physical and situational contexts are among those recognized to be influential factors in information-seeking behavior, but they do not operate in a vacuum. While the environment is important, it can affect users in different ways so the impact of other factors such as personal characteristics, such as a user’s knowledge or educational background or gender, or characteristics unique to a given individual, or the individual search task, the features of the information system, and so on still play a role, even if the environment were deemed “perfect” (Marchionini, 1989, 1997). Even

geographical factors can influence information need. Geographical factors include location, climate, resources, and stabilities. These characteristics play a great role in information-seeking need and behavior of different categories of people. For example, Meyer (2009) studied the influence of information behavior on information sharing across boundaries and learned that information behavior seemed to evolve in ways connected to the cultural and international context. Meyer also discovered that indigenous people's way of life can alter how those groups share and seek information compared to the other cultures in a given locale. Another study of information needs and seeking behavior among health professionals working at public hospital and health center in Bahir Dar, Ethiopia indicated the geographical factors play a great role in the process of information seeking. Furthermore, the study identified organizational, personal, economic, and educational status factors that influence information need and seeking behavior among health professionals (Andualem, Kebede, & Kumie, 2013). Peterson (2014) studied an information service for Spanish-speaking migrant workers in the United States and focused on the difficulties migrant workers face in the information-seeking process as well current policies and practices that affect them. The result indicated that their information needs are attached to socioeconomic, regulatory, linguistic, cultural, geographic and societal obstacles that arise when attempting to obtaining information (Peterson, 2014). When people are in crisis, information needs can be focused on everyday essentials. For example, a study on information-seeking behavior of marginalized homeless youth in Ghana revealed their information needs are directly influenced by the necessity to address their basic needs such health, finding a job, locating shelter, financial advice and counseling (Markwei & Rasmussen, 2015).

Information-seeking can be very targeted based on work needs. A study by Mostofa (2013) explored the information needs and seeking behavior of faculty members of Darul Ihsan University in Bangladesh and found the faculty focused on material related to their teaching and research purpose. Mostofa found that faculty members primarily use a library as a major source of information in order to satisfy their research needs. Likewise the study of Nnadozie & Nnadozie (2008) expressed the two reasons prompting the information needs of faculty and staff were research related to teaching and research relating to publications which were part of the faculty's member's specialization area; in that way, the information needs were purely job-related. Focus on job-related information-seeking was true in other studies such as the ones by Ehikhamenor (1990), who examined the information needs of faculty members in Nigeria and elsewhere and James (1991), who also established that the information needs of faculty are job-related, specifically related to teaching and research publications. Bigdeli (2006) also found in his study that information needs vary according to the area of specialization, which means the information need is determined by the faculty members and their specialization. This means that it's not enough to be an academic and be driven by research; the specific field and subspecialty a researcher engages in will change the research context.

This idea of being career-focused bears out in other fields as well. A study in Ghana explored the information needs and seeking behavior of engineers. The study explored the factors that influenced engineers' information-seeking behavior in order to facilitate the provision of timely and adequate information. The study revealed their information-seeking was influenced by the need to solve a problem, to gain more knowledge, or to make a decision (Tackie & Adams, 2007). The information-seeking behavior of tapioca (cassava) growers in the Salem district of

Timilnadu, India, depended on the economic success of tapioca growers and knowledge of cultivation practices in the area (Murugan & Balasubramani, 2011).

But even among similar groups of people who are seeking similar kinds of information, there are variances. For example, a study explored the information-seeking behavior of small-scale farmers in Tanzania in which researchers learned that location gender-specific information need and seeking patterns among farmers are related to face-to-face and interpersonal communication (Lwoga, Ngulube, & Stilwell, 2010). This bears out in the educational context as well. Another study explored the information literacy skills of secondary school students, known for having skill in finding and evaluating information, in Singapore. Despite all students being reasonably fluent in information seeking, the researchers found that their abilities varied greatly based on the type of schools, the academic streams of study and the student's family background (Foo et al., 2014). The personality of a particular person or user group, including one's life history and current physical, mental, or emotional state, can also impact the information search. Bateman (1998) noted that selecting credible information from among the various available resources is a challenging activity for anyone. The degree to which a given user finds a search task overwhelming may, however, differ based on the user's age as well as his or her personality. For instance, adult information seekers are likely being influenced to select information that they think it is accurate, current, novel, objective, reliable, authoritative, trustworthy, understandable, well-written, comprehensive, easy to obtain and on a topic (Bateman, 1998). Wong et al. (2000) studied men with prostate cancer and found that treatment, survival and self-care are among the factors that influence the information need. Another study conducted further indicated the effect of time available to search which could be limited as a result of sickness, can influence information needs

as stated in Ankem (2006), who explored factors influencing the information needs of cancer patients, which changed based on participants' cancer stage. The determinants of information need vary by the quality of life during the cancer period of coping with the disease. A person's poor health status is likely a factor in what influences a health information-seeking online search (Xiao, Sharman, Rao, & Upadhyaya, 2014).

Another study of patient involvement in patient safety revealed the motivating factors that influence patient participation and engagement in health information and their needs. These include patient-related demographic characteristics, illness-related cases, the availability of health care professional, and the presence of health care facilities (Davis, Jacklin, Sevdalis, & Vincent, 2007). In an exploratory study conducted with 154 urban African American men aged 32 years and older, the availability and types of sources of health information are considered the major influences for African American men's health behavior (Griffith, Ellis, & Ober Allen, 2012). The study also revealed African American men's health information behavior is influenced by a variety of sources including health professionals, the media and members of their social networks. Finally, Wong et al. (2000) studied men with prostate cancer and found that psychological variables influenced their information needs.

2.1.7 Factors Influencing Information-seeking and Searching Behaviors

Information-seeking behavior is initiated by the recognition of some need perceived by the user (Wilson, 1981). There are three categories of "need" including the *physiological* need, which refers to a natural need such as food, water, or shelter; the *affective* needs, which refer to emotional needs; and *cognitive* needs, which arise in the attempt to learn a new topic or skill (T. D. Wilson, 1981). In addition, Morgan, (1958) proposed that needs emerge from three kinds of motives

including physiological motives (e.g., hunger and thirst), unlearned motives (including curiosity and sensory stimulation) and social motives (the desire for affiliation, approval or status or aggression). Similarly, various user groups studies in information-seeking conducted show each group exhibiting different types of information-seeking behavior, style and approach (Case, 2012). Pettigrew (2001), for example, defined information behavior as the study of how people need, seek, give, and use information in different contexts, including the workplace and everyday living (Pettigrew, Woodman, & Cameron, 2001). Wilson (2000) noted that the origin of human information-seeking behavior is found in work in information studies, more specifically, in the library and readership studies, which determine human seeking behavior. The studies try to identify the need that led people to the library as a source of information as well as the social class makeup of the clientele. The root of the problem of information-seeking behavior is the concept of information need, which has proved difficult to describe because so much of a person's information need is subjective and it is going on inside a user's head and the researcher must capture a cognitive process, which can be complex (T. D. Wilson, 1997).

Further complicating information studies is that there so many different type of user groups and therefore many studies conducted in information need, seeking and searching behavior. Information seekers include academics, engineers, medical personnel, consumer health patients, employees of businesses, students, and so on (Case, 2012). Each type of user has his or her own motivations (Ingwersen, 1992; Marchionini & Maurer, 1995).

Numerous research studies of information-seeking behavior have been conducted and revealed several factors that influence information-seeking behavior including the personal characteristics of a person, such as the demographics of the seeker; the search task itself; the

features of the information system that the seeker uses; the information sources available to a given searcher; the type of search strategies available to the user either because he or she has had training (or a lack of training) or because the system only works in a certain way; the user's knowledge of the domain (and the information system's ability to navigate that same domain); the user's prior knowledge in the area (and the information system's ability to use prior searches to predict a user's needs) and so on. Each of these groups are exhibiting different information-seeking approaches that are influenced by varieties of factors (Marchionini, 1989; Marchionini & Maurer, 1995).

The personality of a particular person or user group, including one's life history and current physical, mental, or emotional state, can also impact the information search. Bateman (1998) noted that selecting credible information from among the various available resources is a challenging activity for anyone. The degree to which a given user finds a search task overwhelming may, however, differ based on the user's age as well as his or her personality. For instance, adult information seekers are likely being influenced to select information that they think it is accurate, current, novel, objective, reliable, authoritative, trustworthy, understandable, well-written, comprehensive, easy to obtain and on a topic (Bateman, 1998). Those activities are what a person may engage in when identifying his or her needs for information and this clearly indicates what influence information-seeking has to do with a person's style or personality. As children transition from childhood dependence to adult independence, their social interactions demonstrate a switch in emphasis; parents become less important than teens in decision making processes that identify formation and in validation of behavior (Harter, 1992; Kellett & Ding, 2004; Koumoundourou, Tsaousis, & Kounenou, 2010; Kröger, 2008). The early adolescent years also mark the two important transitions that affect motivation include the young person's shifts in self-perception.

(Sulkowski, Wingfield, Jones, & Coulter, 2011). While educators and sociologists focus extensively on understanding tweens, those early adolescents between the ages of 9 and 12, the transitions as children move from the elementary grade to middle school, there will be continued changes into high school. Because young people spend so much time in school, researchers who study children typically study them in a school context. Little is known about how life changes influence their information behavior, particularly those that occur outside the school context. (Bransford, Brown, & Cocking, 2000; Lesko, 2001; Miles, 2000; Sulkowski et al., 2011).

Other studies involving young people sometimes run into difficult situations. For example, when studying children younger than the age of six or seven, researchers find that these children typically only have one method to solve a problem and struggle to consider alternatives (Siegler, 1991). Older students, as alluded to earlier, have their own sets of challenges. In general, library and information science studies report that adolescents struggle to carve out a sense of “place” (physical, social, and virtual) in order to cope with the stress of their changing lives (Elkind, 1984; Perret-Clermont, 2004), and they seek new information types and information sources as they try to make sense of their evolving identities in an increasingly postmodern & uncertain society (Lesko, 2001; Miles, 2000). Adolescents are interested in finding information about a range of health topics, such as exercise/diet, sexual health, and alcohol/drug misuse. They form one of the most active groups of Internet users, notably (although not exclusively) through an initiative to promote the use of this technology in schools (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005). Agosto & Hughes-Hassell (2006) studied the everyday life information behavior of 27 adolescents aged 14-17 years from an urban community. Their participation showed a clear preference for human sources, especially for friends and relatives, over all other information sources. In the field

of education, several studies have investigated how students from primary to high school use adults and peers in their social network to overcome the difficulties they encounter when doing schoolwork (Laplante, 2014). Bilal (2000), noted that the information behavior of children and adolescents encounters challenges and obstacles in searching for information, retrieving relevant result for specific task, as well as experience difficulty comprehending and interpreting result in various information environments (Bilal, 2000). Moving into college age does not signal the end of possible variations on information searches. A web-based survey conducted of 184 college students demonstrated a preference for Wikipedia and its use. The result indicate that student believed Wikipedia improved their learning and that they appreciated its usefulness, and the researchers hypothesized that this indicated the strong social structure influence of young people, because professors had not been positive about the online encyclopedia and its use (Chung, 2012). Older students continue to prefer the Internet. A study conducted on the information-seeking behavior and scholarly use of information among graduate students applied the method of in-depth, semi-structured interviews at Carnegie Mellon University and found that the Internet plays a major role in student information-seeking due to its convenience coupled with the age group's relative lack of sophistication in finding and using the resources (George et al., 2006). The study of indigenous tradition medical practitioner information-seeking for the treatment of sickle cell anemia reveal that they heavily rely on information from local expert to guide their treatment plans for sickle cell anemia patient (Melssen, 2011) .

Socioeconomic status can affect the information-seeking process. An exploratory case study of immigrant information-seeking behavior in Queens, New York focused the information-seeking on fulfillment of their emotional security, usually linked to the immigrants finding their

place in their new society; they further noted that they wanted to meet others with similar experiences so that they could share their transitional experience or maintain connection with their native culture (Fisher, Durrance, & Hinton, 2004). McCloud and his colleagues conducted a survey study of 519 cancer patients of class, race and ethnicity and information avoidance and the abilities of cancer patient to make decisions and cope with the disease to avoid further information after being diagnosed. Factor analysis was conducted to determine barriers to obtaining cancer information. The result shows that survivors' information avoidance may be drive by social determinants especially among those at the intersection of multiple social status categories. The social determinant and communication barriers lead to avoidance of further information to explore, revealing the social structure of the patients (McCloud, Jung, Gray, & Viswanath, 2013). The study of rural dweller information needs and seeking in Ekpoma, Nigeria reveals behaviors are attached to the socio economic status of how they will address their health, agriculture and community development needs (Momodu, 2002). Another study conducted on the comparison of factors influencing information behavior among undergraduate students and teachers in University reveal 7 factors including attitudes toward the information, barriers and facilitating conditions, physical information sifting, social influence, information collecting, Internet information examination and interaction with others via the Internet (Shyu & Pern, 2013).

The level of educational or experience of an information seeker can contribute significantly to their information need, seeking and searching behavior. Significant literature discussed information-seeking and behavior identifying the level of experience and educational status as part of the factors contributing a user group to seek information or engage in information-seeking behavior. In the college context, many studies show a general lack of information-seeking

strategies for undergraduate students. For example, Zondi (1992) who explored library use, skill, and information-seeking patterns of the first year students at the University of Zululand, South Africa, found that there was a lack of effective user education programs which had made it difficult for students to find resources. Osiobe (1988) observed the poor use of abstracts and indexes by students resulted in a call to integrate instruction on the use of information access and library resources in some compulsory undergraduate courses. Anwar (1981) studied the use of subject literature by in-service teachers at the University of Punjab, India, and concluded that user education programs offered to students do not succeed in achieving the basic goal of developing the ability to use the source of information independently.

Similarly, we find ourselves today dealing with more information in all aspects of our lives, including information in digital form, which is accessible and available from anywhere in the world with a few computer keystrokes or mouse clicks. Our world continues to become more and more complex, interconnected, and dynamic, so much so that our professional and personal lives are routinely spent interacting with complex systems (Marchionini, 1997). However, user groups' information needs and their searching and seeking behavior remain associated with information resource availability. Thus, in a similar way that an old card catalog organized cards in such a way that users might struggle to find the right combination of words that would lead to the books they sought in a library, today's search engines play an active role in the search process, as the programming of such engines determines what information users can actually access. In other words, if a user cannot turn his or her inquiry into words that the intermediary—whether it be an index card or a search engine—can understand, finding and retrieving information becomes difficult. Therefore, information retrieval still involves an interaction between the user, the

information object, and the search engine (Xie & Cool, 2009), because systems extract the concept behind the user's queries to return only those documents that match those concepts but may not be related to the user's request (Lin et al., 2004). Users are forced to compromise their need when they are given only what is available in a database or retrieved by a search engine (Xie, 2008); this causes many users to have difficulty in finding information on the Web (Stronge, Rogers, & Fisk, 2006). Bates (1979) stated that searches are categorized by search strategies and search tactics, tactics referring to an immediate choice or action taken, whereas strategies refer to combinations of tactics.

Based on this, search strategies are among the important factors in numerous studies conducted to influence the information-seeking behavior of user groups, as discussed below. A qualitative study conducted by Pelzer and Leysen (1988) at Iowa State University sought to evaluate veterinary medical students' perceptions of the demands placed on them when locating clinical information and to determine where they obtained it. The study revealed that the electronic environment has provided new opportunities for information to professionals in their information-seeking behavior on the Internet. (Throughout this study, I distinguish between the Internet (a huge network of computers all connected together) and the World Wide Web (a collection of web pages found on this network). Likewise, Borghuis and Staff (1996) found that graduate students viewed more abstracts and searched electronic journals more actively with a broader focus than faculty. While undergraduate usage was not examined in depth, log data indicated a significant degree of activity by this group. Bilal (2000) conducted a study that explored seventh-grade students' use of Yahoo!igans!, a Web search engine designed for young people. The findings indicated that searchers would examine the first several hits on the initial results page rather than examining

every hit in detail. Children failed in the search tasks mainly due their lack of knowledge of search engines. Bilal's study shows that the study participants preferred keyword searching to browsing, because this more rapidly reduces the pool of sites from which they must make the selection decision.

Fredlander, (2002) studied the information-seeking behavior of high school, college, and university students and found that the availability of resources impacted their ability to perform the kind of research they would prefer; if something was not available, they'd simply shift to something else. In a study of 18 people interested in the environment, a researcher found that the best locations, according to those studied, were ones with good information and that were also easy to use (Savolainen, 2008). Further, availabilities of resources were a factor in the comparative studies between Bachelor of Science and Master of Science department of Agricultural extension students (Sookhtanlo, Mohammadi, & Rezvanfar, 2010). This fits in with the work in the medical field that said that patients seeking medical information prefer information to be written in plain English, suggesting a desire for ease of comprehension as well as ease of access (Butow, Brindle, McConnell, Boakes, & Tattersall, 1998). Schacter and Dorr (1998) found that fifth- and sixth-grade students had difficulty finding desired information on the Web. Participants in their study exhibited a strong preference for browsing over analytical (planned or meditatively structured) search techniques. Furthermore, another study (Fidel, Davies, Douglass, & Holder, 1999) of high school students' Web-searching process using observation and think-aloud protocol analysis was conducted. They found that the participants were quick to abandon the seemingly unsuccessful searches, returning to the known landmark to begin a new search. Also, empirical evidence generally supports the view that individuals do modify their behavior in

response to different search costs, applying strategies such as limiting the amount of information they obtain or number of sites they visit (Sujan, Bettman, & Sujan, 1986).

Similar evidence regarding children's abilities to balance cost and benefit in gathering information revealed that young children were able to modify their search behavior in view of search benefit (Gregan-Paxton & John, 1995). Also, a study of Internet searching on the Web conducted by Hoelscher & Strube (1999) confirmed that knowledge is relevant for Web-based information seeking, and the structure and strategies involved and the effect of search tasks are influenced by the knowledge or Web experience of the domain (Hoelscher & Strube, 1999). Further, the study revealed that what happens on the Web is the acquisition and consumption of online resources such as song lyrics, knitting processes, software download (i.e., information artifacts users consume more than in a single use), and information reading. They argued that if Web search engines are to continue to improve in the future, they will need to understand user behavior—not just how people search but why.

Another study by Rose and Levinson (2004) focused on understanding user goals in Web searching. The authors revealed two factors that may influence users: the navigational query and the informational query. They further stated that searchers had information goals in mind and were over-influenced by the type query they already needed to search, whether it was appropriately compliant to the IR system or the subject search. In a related development, Wen, Nie, and Zhang (2002) studied a clustering method analysis based on keywords unsuitable for query clustering and applied the study to the Encarta encyclopedia, where they applied a user logs method, allowing them to identify document users selected for querying. The findings showed that the combination of both keyword and user logs was superior to using either method alone. Similarly, another study

agreed that query formulation can confuse many searchers, and one study showed that fewer terms tended to outperform a larger number of query terms and that the difference was statistically significant for information retrieved (Mu & Ryu, 2010).

Another study by Song and colleagues identified ambiguous queries in Web searches by constructing a taxonomy of querying ambiguity, revealing that query ambiguity is predictable to some extent (Song, Luo, Wen, Yu, & Hon, 2007). Yet another study, which investigated how people personally perform motivated searches, revealed that searchers navigate the web pages they have visited and stay within that family rather than reforming another search engine query (Teevan, Alvarado, Ackerman, & Karger, 2004). The study further revealed that 40% of queries are influenced by the existing search tasks conducted by other users (Teevan, Adar, Jones, & Potts, 2007). This study found that users have different search needs at different times, and in different contexts (Sutcliffe & Ennis, 1998).

Furthermore, Hong et al. (2009) stated that difficulties of terminology difference between health care provider and health consumer had created much havoc and adversely affected consumer access to health information; this resulted in poor satisfaction for patients and providers. Also, Zhang (2008) confirmed a significant difference among consumer health queries used by medical professionals when describing medical terms. Another study conducted on Web searching by the public analyzed over 1 million queries using the Excite search engine. The study confirmed that users mostly search a few short query terms and spent little effort in re-modifying their queries; they explored a minimal number of Web pages, and very few queries used advance search features (Wolfram, Spink, Jansen, & Saracevic, 2001). This created many problems for users, including the health consumer, in information searching.

Numerous authors discussed issues related to search strategies, including comments on framework querying, searching, and browsing (Belkin, 1993; Chang & Rice, 1993; Marchionini & Maurer, 1995; Waterworth & Chignell, 1991), interface usability (Hertzum & Frøkjær, 1996), query formulation in general and short queries (Anick, 1994; Teevan et al., 2004; Waterworth & Chignell, 1991), search engine query log-ranked retrieval (Granka, Joachims, & Gay, 2004; Hotchkiss, Garrison, & Jensen, 2005), and Web search strategies (Toms, Freund, Kopak, & Bartlett, 2003). A review of factual and topical task search studies (Navarro-Prieto, Scaife, & Rogers, 1999; Palmquist & Kim, 2000; Schacter et al., 1998; White & Iivonen, 2001) produced the simple conclusion that topical tasks require more browsing, whereas factual tasks need more analytical searching strategies (Bates, 1979).

Furthermore, the simplicity of how information communication technology (ICT) performs nowadays in terms of ease of use and fast accessibility has greatly contributed to modern search tasks. For example, a study of undergraduate students found the easier a system was to use, the more likely the user would completely engage in the search task (Ajiboye & Tella, 2007). The same study also noted that the younger generations demand speedy results; if a system does not return accurate results quickly, then the younger generations are not interested in using it (Ajiboye & Tella, 2007). Additional studies confirmed that information searches are influenced by speed and ease of access to information (Ellis, 1989, 1989; Kerins, Madden, & Fulton, 2004; Kulviwat, Guo, & Engchanil, 2004; Steinerová & Šušol, 2005). The rise of the Internet and its accessibility on many devices has impacted studies in this area. Internet accessibility plays a great role in graduate students' information search (George et al., 2006). This phenomenon is not limited to students in academic contexts, as patients who research their own health concerns (or investigate

concerns of others) are more satisfied if they can understand how to use the system being used to conduct the research as well as the content they find (Butow et al., 1998).

Fidel and Green (2004) confirmed the accessibility in the selection of information sources is important to engineers' selection of information sources. Quigley et al., (2002) conducted a survey study at the University of Michigan to investigate the importance of six factors including speed, convenience, familiarity, currency, authoritativeness, reliability and availability on their information resources. They found that convenience was the most important factor the engineers use in selecting their information. The convenience and portability are factors influencing information-seeking focused on journal usage (Tenopir, King, Edwards, & Wu, 2009). Bateman's (1998) study also identified adults are select information because it is accurate, current, novel, understandable, well-written, comprehensive, easy to obtain and on topic.

2.2 Theoretical Framework for Information Needs and for Seeking and Searching Behaviors

Taking a step back, contemporary information research is situated within a theoretical framework. Much like the term "information," "theory" is a term that is difficult to explain in concrete terms. A theory is an explanation of an observed, systematic interrelationship among concepts for the purpose of describing, explaining, predicting, and controlling phenomena; theories are distinguishable from models because models typically combine one or more theories and are more focused (Baker & Pettigrew, 1999; Case, 2012; Odi, 1982). Also, Creswell (2003) stated that theories provide an explanation of phenomena by identifying the variables and their relationships in the study. A model, on the other hand, is defined by Wilson (1981) as a framework for considering a problem, which may change into a statement of the connections among theories.

Similarly, Case (2006) defines a model as a simplified version of the reality of how phenomena occur among variables. Therefore, a theory is an idea that can explain observed phenomena, but a model tends to be an idea that may combine many theories to address the relationship between or among ideas.

2.2.1 Overview of Theories and Models of Information Needs and of Seeking and Searching Behaviors

User studies of information needs depend much on the approach and the angle from which the study is approached. To understand the user comprehensively, many approaches, theories, and models must be used as conceptual frameworks in order to define what the user studies encompass. Therefore, information behavior deals with how people engage in their information needs, including seeking, managing, using, and disseminating information, both purposefully and passively (Fisher & McKechnie, 2005). Much research has been conducted to explore the trend of information-seeking behavior (Wilson, 1999). Information-seeking behavior is a relatively new trend of research that focuses the researcher's attention to study the relationship that unfolds between a user and the system he or she uses to seek information.

Furthermore, many researchers have engaged in the study of the information-seeking behavior hoping to develop theories and models to summarize their research findings (Kahlal, 2011). As mentioned earlier, a model is a framework in which research attempts to explore a problem by turning it into a statement of the relationship within the theoretical proposition (Wilson, 1999). A number of theories and models of information-seeking behavior have been formed primarily within the period between 1966 to 1981 (Ingwersen & Järvelin, 2005, 2006). This section will explore those early models that are classified based on the main categories that address information needs as well as seeking and search behavior, including: conventional theories

and models of information needs and seeking and searching behavior, the interactive information retrieval theory and models, the cognitive reasoning information model, the work and context situational theory and model, and the recent model that has been developed from existing theories and models.

2.2.2 Information Needs and Seeking and Searching Theories and Models

Many theories and models have been used and applied in the study of general information needs and seeking and searching behavior, including the level of information need. This section will highlight some of those theories or models that, in one way or another, are related to this research. In the beginning, Robert S. Taylor developed the theory of the “level of information need” (Taylor, 1968). In his famous article “Question-Negotiation and Information-seeking in Libraries,” he created a four-step information need model that attempts to demonstrate how users realize they need information and take steps to gain that information.

Taylor discussed four levels of information need in his model; they include: 1) Visceral Need: the individual knows something is wrong or missing, but it is currently hard to pinpoint; 2) Conscious Need: at this level, the user realizes that he or she is missing information and can stammer around a bit trying to articulate it; 3) Formalized Need: when the user is able to explain specifically what he or she is looking for, and, finally, 4) Compromised Need: when the user is aware that he or she is going to have to deal with the resources at hand, so what he or she wants must be expressed in terms of the limitations presented by the actual resources available (Taylor, 1968). To meet an information need, the user, at least at the time when the article was written, typically goes to the library to speak directly to the librarian and/or to browse through the resources on his or her own.

Taylor's theory established a basis upon which ideas related to information retrieval processes have been developed over time. Numerous studies of information-seeking needs and searching behavior have been conducted using Taylor's Levels of Information Need as reported by Xie (2008), which is similar to the current study of rural health information seeking. The theory is more practically oriented; it's built to fit into the library context on question negotiation and in fact, it can be easily applied in the myriad new ways that users seek information today. Visceral & Conscious needs are among the components Taylor's theory portrayed that fit into the current research as a *Visceral Need*; in other words, the individual knows something is wrong or missing, but it's currently hard to pinpoint; 2) *Conscious Need*; at this level, the user realizes that he or she is missing information and can stammer around a bit trying to articulate it. In spite of that, the theory can be limited because there is always the chance that there will be misunderstandings when intermediaries get involved in an individual's search for knowledge and a user might struggle with using the resources available to answer a question and be unable to answer his or her question using the resources available (Taylor, 1968; Xie, 2008).

Another theory that discussed information needs and seeking and searching behavior is that of Brenda Dervin who introduced the "Sense-Making Approach" model to information studies. This theory was developed as an approach to address the user-centered human information interaction with an information-retrieval system (Dervin, 1992). The Sense-Making Approach concept is rooted in American communication research and inspired by library and information science, especially information needs and use (Savolainen, 1993; Xie, 2008). The Sense-Making Approach describes how a user proceeds but might stop completely when he or she realizes that there is a gap in their knowledge, or "cognitive gap," and cannot move forward again until he or

she bridges the gap with knowledge (Dervin, 1983). The model is highly relevant to information research studies, as it shows the steps and processes that a user, such as a student, goes through in searching for information (Kahlal, 2011).

Dervin's model included four situations in which a knowledge gap might arise, including (1) a situation in which the problem arises, (2) the gap between a person's current awareness of a situation and where he or she would like to be in terms of knowledge, (3) the outcome reflecting the final result of the sense-making procedure, and, finally, (4) the bridge that closes the gap that began the inquiry in the first place. Individuals are assumed to continuously move within time and space in this sense-making process (Savolainen, 1993). Dervin's theory of Sense-making is an alternative framework focusing on how to understand a user's need. It consists of some basic assumptions about human reality that people simply do not seek information in a vacuum (Ingwersen & Järvelin, 2005). This idea of information-seeking occurring within a specific context is an important consideration the current study as the Sense-making theory identifies three ways or processes involving the situational gaps of information seekers. The model provides a suitable framework in which the information behavior trend moves during the process of information seeking. However, Sense-making theory is rooted in Western values and focuses on a person's uniqueness within society whereas some cultures focus more on group participation over individuality. Given the current study's placement outside of Western tradition, Sense-making theory may not fit in without modification.

Furthermore, Nicholas J. Belkin built a model (Belkin 1980; Belkin, Oddy & Brooks, 1982a, 1982b) called the Anomalous State of Knowledge (ASK) model. The "Anomalous" part refers to a user's state of knowledge that has a gap of some kind (Fisher & McKechnie, 2005). The

user realizes this and now has a goal to resolve this problematic state of knowledge (Belkin, Seeger, & Wersig, 1982). Belkin's theory builds on Taylor's theory because it helps explain why users have a gap in their knowledge in the first place (Xie, 2008). Belkin's addition contributes to the idea that the information-seeking process originated with a problem and that the information needed to solve the problem is not clearly understood. This forces the user to apply an iterative process with many stops, starts, and redirects in order to articulate the search request (Chowdhury, 2010). Belkin's Anomalous Sense of Knowledge concept (1985) applies information-seeking within real-life problems and human behavior as viewed through a psychological lens. Belkin's focus on information retrieval as a computer-based interaction makes it difficult to even fully consider the user's role in the process and therefore it can be difficult to ask a user question. Furthermore, the model did not examine strategies in how to bridge a gap in the user's knowledge. However, Belkin's Episode Model does use a real-life problem and does focus on a psychological understanding of human behavior. This focus on real-life problem-solving and human interaction will include the exploration of the cognitive process where information forms knowledge. The element of psychological undertone in this model will greatly help in the current study understanding the rural community social and behavioral interactions (Belkin, Cole, & Liu, 2009)

The description of the condition as an anomaly was used to explicitly indicate the condition of inadequacy in the suitable information, not only as a lack of knowledge but the many other problems that can arise in the information-seeking process (Fisher & McKechnie, 2005). Similarly, Ellis developed a new model from a grounded theory approach in 1989. Ellis found that the interaction between any two features of his model depended on the situation in which a person with information need found himself or herself, and no matter what the circumstances were, the

process must begin with “Starting” features and “Ending” features (Kahlal, 2011). Ellis’ model appeared to be between the micro- and macro-analysis of information, meaning that this model could be applied to different levels of the information-seeking process (Wilson, 1999).

Ellis employed Glaser and Strauss’s grounded theory approach and generated seven steps in the information-seeking process of social scientists, including: (1) Starting, referring to the initial process of information searching and potentially the source identified; (2) Chaining, a backward or forward connection of materials sought; (3) Browsing, or searching, the process of the user exploring the area including the content and subject headings; (4) Differentiating, determining the relevance and quality of the sources located; (5) Extracting, actually selecting materials as a result of the differentiating step; (6) Verifying, a process of authenticating the data and ensuring that it is correct; and (7) Ending, the final step of searching process. He further added that the processes did not necessarily have to follow all the stages in a strict order, but most processes generally contain some or all of the steps (Case, 2012; Chowdhury, 2010; Ellis & Haugan, 1997; Xie, 2010). David Ellis’ Information-seeking behavior model of social scientists can be applied to many empirical situations in a different multiple studies of domains (Jarvelin & Wilson, 2003). The model outlines six features in making a judgment about accessing information as users engage in various strategies of information-seeking patterns. The model is recognized to have been widely used by scholars in the social sciences making it an appropriate selection for the current study. However, this model does not indicate a causative factor to directly explain the information-seeking behavior (Jarvelin & Wilson, 2003). Also, the model does not identify the cognitive activities of the search process as it is paper-based and does not consider electronic systems.

The Savolainen (1995) model offers a framework for the study of everyday life information-seeking (ELIS) in the context of the relationship between work and leisure, including hobbies. The model involves “nonwork” activities related to the action of information behavior that previous models had neglected; this includes shopping, taking care of our home, our personal interests, pursuing our hobbies, etc. The model incorporates more sociological and cultural concepts because of its nature of studying the personal behavior of individuals in nonwork contexts. Savolainen’s ELIS Model demonstrates the role of values and social and cultural factors in information-seeking considering the cognitive order of information seeking. The model involves “nonwork” activities related to actions causing information behavior that previous models had neglected; this includes shopping, taking care of our home, our personal interests, pursuing our hobbies, etc. The model is more incorporated with sociological and cultural concepts because of its nature of studying the personal behavior of individuals in nonwork contexts. Savolainen’s model is ultimately concerned with what he calls “Mastery of Life” (Case, 2012). This idea directly touches the community the current study examines because human needs go beyond the work context. Despite this strong connection to the study, the model does not examine the connections involve in the information-seeking process and it can be, therefore, difficult to understand what orienting information is and what is practical information, both of which are necessary to understand in order to fully use this model effectively.

In the area of interactive information retrieval, various models and theories discuss the framework of interactive information needs as well as seeking and searching among users, including the Berry-Picking model introduced in 1989 by Marcia J. Bates. She showed that as a result of reading information retrieved during the search process, the actual information search

changes over time. The idea of “berry-picking” refers to how individuals pick berries: they pick a berry here and there, then move on to another bush and pick berries from that bush. Over time, there is a basket of berries, but they came from a variety of places; so, too, do people pick information from a variety of sources and gather them together into a unified whole of some kind. The model suggests that information needs can be satisfied by the accumulation of information that users acquire during the information-search process. The model has four layers: (1) the infrastructure layer, comprised of the network, hardware, software, and database; (2) the information, or content, combined with the metadata structure; (3) the information retrieval system itself; and (4) the human part of the system, which consists of the searching activities and user understanding and motivation (Bates, 1989; Chowdhury, 2010). The Bates model allows more flexibility in the search process. This model clearly exhibits a dynamic search process where search queries could change during information seeking. This idea connects to the very real possibility that people in rural communities will have to reformulate search queries. However, the model is limited in that it does not explore factors influencing searching processes in certain forms of information seeking.

Iris Hong Xie presented a planned situational model that illustrates how the plan and situation of an individual user co-determines the user’s selection of information-seeking strategies and the shift in information-seeking strategies as time continues (Xie, 2007, 2010). The major components of her model include the level of user goal, the level of tasks and their dimensions, personal information, infrastructure, the social–organizational context, the information retrieval system, plans and their dimensions, situations and their dimensions, and information-seeking strategies. The model employs a user-centered approach, developed and based on interactive

information retrieval studies in different digital environments. Xie's model contains some of the components such as the level of a user's goal and the level of a user's task. This distinction can clearly help to determine the information need problem at hand of in the current study as asking the rural community as part of the "goal" and how much information they need, which can be summarized at the level of user "task". However, the model is limited to interactive information retrieval studies in different digital environments, which may be less evident in rural communities' information-seeking behavior research.

One of the models proposed by James Krikelas in 1983—among the few people at that time to introduce such a model—emphasized the importance of uncertainty as a motivating factor offering the potential for an information seeker to find an answer from his cognitive memory (Ingwersen & Järvelin, 2005). Krikelas' model contains 13 components arranged in a causal process flow chart that moves downward with feedback provisions. The model begins at the top level with "information gathering" and "information given," which are stimulated by activities in the contextual environment of an information seeker. Furthermore, the information gathering attempts to create a cognitive picture of the environment in order to facilitate the information seekers needs (Case, 2012). The strength of Krikelas' model is it focuses on the uncertainty and the level of urgency of the user in information seeking. This involves the user's perceptions that are influenced by his or her activities. The model begins at the top level, with "information gathering" and "information given" which are stimulated by activities in the contextual environment of information seeker. The model helps the current study by determining the process rural communities follow in uncertain and urgent situations in meeting their health information

needs. However, the model does not examine a specific individual user; it is more general in context.

Kuhlthau (1991) formulated an information-seeking behavior model called the “Information Search Process” (ISP) Model. In her model, she identified six stages in the information search process, incorporating the attributes of feelings, thoughts, and actions for the individual’s information search into each stage: (1) initiation, where the individual is confronted with the task of recognizing his or her need for information; (2) selection, where the task is to identify and to select the general topic to be investigated; (3) exploration, where the information searcher is attempting to extend his or her understanding by exploring information on the general topic of the search; (4) formulation, where the information searcher’s task is to focus, using information that the user has thus far encountered in the searching process; and (5) collection, when the seeker begins to gather some information from the system being researched related to the focus topic. Finally, the information search process is completed with (6) presentation, where the user presents his or her findings in some way.

Because Kuhlthau’s model focuses on how people are thinking and feeling during the process, it is unique (Kuhlthau, 1988), though the model does not concern itself with context (Pettigrew, Woodman, & Cameron, 2001; I. Xie, 2010). Kuhlthau’s model of the information-search process is considered to be universally accepted and can readily be applied to any context or domain, based on the theories of cognitive effect stages she identifies related to human behaviors (Case, 2012). However, Chowdhury (2010) reported that Kuhlthau’s model’s strength has a limitation, as not being tied to a context, which might actually weaken its effectiveness.

Kuhlthau's ISP Model is considered to be universally accepted and can readily be applied to any context or domain, based on the theories of cognitive effect of stages she identifies related to human behaviors (Case, 2012). The model examines the user's feelings, cognitive thoughts, and physical actions, and how to accomplish a task. This idea is central to the current research study because the rural community's anxiety, feelings, and physical search process in finding information is vital and what the study is set up to find. Furthermore, many similar studies related to rural information need, seeking, and searching behavior have used Kuhlthau's model. In spite of the wide acceptability of the model, there are some limitations. For example, the Information Search Process Model does not represent any contextual factors leading directly to the recognition of information, nor does it follow a specific pathway, in that it does not examine the type of information need the user has and the information source but only portrays the general approach for the search process.

Many other models discuss issues related to information-seeking but are relatively minor and have not been covered here. Some of these models are either not popular due to not being cited, or their conceptual bases are tied back to earlier models discussed above. Therefore, in the years to come, the field of information science will continue to produce more theories and models that explain why and how individuals search for information. Such theories and models can provide a basis for forecasting changes and guide future researchers in designing effective strategies for enhancing information-seeking behavior.

2.2.3 Theories and Models of Health Information-Seeking Behaviors

This section explores the information needs and the research about seeking and searching in the area of health information, a specific subset of the general area of information needs,

seeking, and searching. Health information-seeking theories and models are used to predict the activities and behavioral patterns of how people engage during the process of health information-seeking (Lalazaryan & Zare-Farashbandi, 2014). The following are some of the models used to evaluate the credibility of health information seeking. First, the Freimuth, Stein, and Kean model was designed as a health information acquisition model utilized in studying the Cancer Information Service (CIS), an organization founded by the National Cancer Institute of the United States in 1975. Freimuth et al.'s health information acquisition model has six stages: stimulus, information goal setting, cost-benefit analysis of search, search behavior, information evaluation, and decision point on adequacy of information. The stages are part of a decision-making form within a flowchart format in which the decision in each stage determines whether one can advance to the next level or repeat the previous ones. It is more descriptive in form and does not investigate personal or contextual factors effecting information-seeking behavior.

Part of the strength of this model is that it acknowledges that the information-seeking process can be iterative, by showing a feedback loop after the information evaluation stage to determine whether the gathered information is sufficient or not. If the required information that is gathered is not satisfactory, there is the possibility of returning to the level of the cost-benefit analysis stage and repeating the process until the required amount of information is obtained. This model has more advantages than other models of health information-seeking behavior as it has a feedback loop and is considered to be a linear model (Lalazaryan & Zare-Farashbandi, 2014; White, 2016).

The model is helpful to the current research study because some of the components which include the “stimulus,” “information goal setting,” “search behavior,” and “information

evaluation” are significant in rural community research settings where all the components mentioned are exploratory tools aiding the study to acquire the relevant information. The model suffers some limitations. For example, it is centered on information regarding cancer, which may not be connected to other types of conditions in the consumer health information context.

Johnson and Meischke’s (1993) model, called a comprehensive model of information seeking, describes the four factors affecting the information seeking, namely, demographic factors, direct experience of people, salience, and beliefs of people. This model was used to study women seeking information related to mammography in magazines; it included the demographic factors of age, gender, education, ethnicity, socioeconomic status of information seekers, direct experience (including the experience of the information seekers regarding their health condition), and salience (Case, Andrews, Johnson, & Allard, 2005; Johnson & Meischke, 1993; Lalazaryan & Zare-Farashbandi, 2014). Salience refers to the information gathered by a person not only to satisfy the information need but whether such information is applicable as well. Salient information acts as a bridge to cover a gap, solve a problem, and remove ambiguities. People’s beliefs about themselves and the world determines the form of their information seeking. For example, a person who does not believe having information about a problem will change his situation will never search for information related to the problem (Lalazaryan & Zare-Farashbandi, 2014; White, 2016).

In Johnson and Meischke’s Model (1993), information acts as a bridge to cover a gap, solve a problem, and remove ambiguities. People’s beliefs about themselves and the world determine the form of their information seeking. For example, a person who does not believe having information about a problem will change his situation will never search for information related to

the problem (Lalazaryan & Zare-Farashbandi, 2014; White, 2016). The model is significant to the current research study because it recognizes that the basic demographic factors in the current study which include age, gender, education, ethnicity socioeconomic status of information seekers and salient information are necessary to determine not only whether the information gathered by a person satisfies the information need but whether such information is applicable as well, it acts as a bridge to cover a gap, solve a problem, and remove ambiguities. The limitation of the model is that it is intended more to bridge the gap, solve problem and remove ambiguities but does not offer an appropriate channel and source for accessing the information.

Similarly, Lenz's information-seeking model consists of six stages (Lalazaryan & Zare-Farashbandi, 2014; Lenz, 1984). First, the information-seeking stimulus is derived from within the person's previous experience related to sicknesses, symptoms, or injuries or from the environment in which the person lives. Second is setting information goals, defined as the condition of seeking and gathering of information. This goal setting leads to centralization and limits unnecessary and side activities. Based on the goal, the patient determines the time frame in which the information needs to be gathered, the sources to be used, and the type of information to be sought. The third stage is decision making, regarding whether or not to actively seek information and identifying the stimuli of the person's experience with sickness. It leads to making a decision about whether it is necessary to actively seek information or not. These decisions are influenced by the amount of previous information the person had, the background regarding the problem, and the expected cost benefit that is required in information seeking. The issue associated with the situation of financial difficulties, time constraints, hopelessness, confusion, and poor physical and mental health caused by the disease can outweigh the zeal of actively being involved in information seeking.

The fourth stage is itemized search behavior; this stage refers to a person who decides to seek information actively. The extent of the search is determined by two factors: the number of alternatives investigated and the number of dimensions of each alternative. The extent of the search can differ from an in-depth search to superficial information-seeking and has a direct relation to the amount of information gathered. The fifth stage is information acquisition and codification, where an information seeker will evaluate the information gathered to determine whether the information acquired is new and relevant or new and irrelevant. The last stage is decision making based on the adequacy of acquired information, where information is evaluated to determine whether information-seeking needs to continue or stop. The criteria for this evaluation are subjective and based on the resulting comparison between the information needed and obtained and the cost-benefit of information-seeking or goals determined before starting the process of information-seeking (Lalazaryan & Zare-Farashbandi, 2014; Lenz, 1984).

Lenz's Information-seeking Model is directly related to the current research study. The six stages, which include stimulus derived from the person's previous experience related to sicknesses, symptoms, or injuries or from the environment; setting information goals; decision making, in other words, whether or not to actively seek information; and itemized search behavior form the core part of health information-seeking behavior as reported in previous literature. The limitation of the model is that, while related to health information-seeking behavior, it focuses on information related to last stage, which is decision making based on the adequacy of acquired information, where information is evaluated to determine whether information-seeking needs to continue or stop. The criteria for this evaluation are subjective and based on the resulting comparison between the information needed and obtained and the cost-benefit analysis of information which is often

difficult to test in rural communities' health information-seeking processes because rural communities, particularly non-Western rural communities, may use different kinds of analysis.

Another model established by Miller (1989), called the Monitoring and Blunting hypothesis, refers to coping styles of people when they face life-threatening situations. When a seeker of information is confronted with a life-threatening health situation, he or she will engage in the search of massive amounts of information related to their current situation. The active information seeker tends to gather a massive amount of information about their health problem, their health status, prevention methods, side effects of medication, and treatment methods. While others who do not actively engage in active information-seeking have a minimum level of information at hand, the hypothesis reported that active information seekers demonstrate higher stress levels and have a higher level of anxiety, as they are responsible for their own health and monitoring its status. The model demonstrates that those refusing to actively engage in seeking information are faced with critical situations in their health status and are exposed to more danger compared with active information seekers, as the former are not equipped to cope with sickness (Lalazaryan & Zare-Farashbandi, 2014; Miller, 1989, 1995a; Miller & Green, 1985).

Miller's model demonstrates the response speed at which the rural communities actively engage in health information-seeking behavior as a result of a critical health situation they face. The model further refers to users who might refuse to actively engage in seeking information and are faced with critical situations in their health status and are therefore exposed to more danger. This particular model connects to the process this study found in rural communities because the rural residents often do not know they need more information. The model can be limited, however, because it does not take into account the need to acquire more information to address a life-

threatening situation because the seeker did not have a good evaluative process and may have lacked proper sources to acquire the information.

Folkman and Lazarus' (1988) Theory of Stress and Cognitive Appraisal is a process exploring the impact of stress in one's life. Cognitive Appraisal refers to the idea that two factors that contribute to an individual's response to stress are: how threatening the stress is to the individual and his or her assessment of the resources required to mitigate or eliminate the stress. People cope with this stress differently. There are two types of coping: problem-focused and emotion-based. Problem-focused coping is where people concentrate more on the problem that is the root of the stress and try to take action in solving the problem. At this stage, people use all of their effort to make sure they have acquired all necessary resources to deal with a stressful situation by attempting to gather information, and deal with the problem with interpersonal relations and planning. An emotion-based coping method, on the other hand, is when an individual seeks to reduce the negative feelings resulting from stressful situations. The individual uses a pragmatic approach that includes distancing, escape, or avoidance; accepting responsibility or blame; self-control over the feeling; seeking social support; and positive reappraisal. On a general note, people have reported applying both coping approaches (Folkman & Lazarus, 1988; van Berkel, 2009).

Folkman and Lazarus' theory suits the current study as it explores the coping process of living with health issues and focuses on problem-based and emotion-based concerns. Problem-based concerns include how people concentrate more on the problem at hand and try to take action in solving the problem while the emotion-based concerns focus on how individuals seek to reduce the negative feelings as result of stressful situation. The problem-based and emotional concern

serve as central phenomena of the current study at which individual health concern of problem and emotion trigger the process of health information seeking.

Longo et al.'s (2010) expanded model of health information-seeking behavior was designed to understand the nature, source, and usage of health information related to chronic disease. It was initially designed as model based on qualitative data to investigate the information-seeking behavior of women with breast cancer. In 2005, the same model was used to investigate the information-seeking behavior of diabetic patients; Longo introduced a new model based on the previous one with minor changes for these patients in context. Two factors of the information-seeking behavior of patients are examined in the model: (1) personal factors, including demographic and socioeconomic factors such as health history, genetics, anxiety, status, cognitive abilities, interpersonal communication motives, and (2) contextual factors, including health situation, health care structure, delivery of health care, information environment, information-seeking for self, family member or friend, and data risk with current medical problems. The significance of this model over others is that the combination of active information-seeking and passive information receipt increased control over the disease, creating satisfaction in the patient through the ease of everyday activities (Gavgani, 2010; Lalazaryan & Zare-Farashbandi, 2014; Longo et al., 2010; White, 2016).

Longo's model fits the current study as it focuses on understanding the sources and usage of health information related to chronic disease as it deals with the process, nature, source and usage of health information. The model is widely practiced and applied to qualitative data investigations especially in information-seeking behavior similar to the current study. The

limitation of this model that it does not have the process of evaluating the accuracy of health information sources used in related chronic diseases.

The Trans-Theoretical Model (TTM) of health behavior changes deals with changing patterns of how to transform people and help them have a healthier life (Prochaska & Velicer, 1997). This includes advising people to quit health-threatening practices such as smoking or eating unhealthy food, encouraging healthy habits such working out, or helping them to better manage some of their bad health behaviors in order to improve their health and avoid sickness. This model also names a stage of change and readiness, which was first used in the area of addiction, to discover a way in helping people quit smoking. The most important stage of this model is the behavioral change of discontinuity, in which people follow a linear stage to the final goal.

The model posits four main processes: 1) Contemplation stage, in which a person has no intent to change his or her behavior and might not even be aware the problem exists. The contemplation stage is a situation where a person is aware of the problem and seriously contemplates changing the situation but has not taken any action, caught in a state of mixed feelings; 2) Preparation stage, in which a person has recognized the problem and is ready to accept change, starting with a small change; 3) Action stage, a situation in which a person creates serious change in behavior, experience, and environment in order to address the problem; and, lastly, 4) Stabilization, when the person tries to stabilize and prevent returning to the past condition (Lalazaryan & Zare-Farashbandi, 2014; Prochaska & Velicer, 1997; Wathen & Harris, 2005).

Prochaska & Velicer's model provides the framework of prevention measures. This model applies to the situation where the stages of health behavior change including advising people who have a chronic disease to quit a health-threatening practice. This is in conformity with the current

study as rural community members may need to learn to follow a certain practice to prevent themselves from the emerging health disease the study is investigating. The limitation of the model is that it was tested on tobacco-smoking people to encourage them to quit smoking, which is not necessarily as complicated as ceasing normal “everyday” practices to prevent sleeping sickness.

Table 1 summarizes the possible interrelations and contributions of theory/model relationships to the study of information needs and seeking and searching that will contribute to achieving the research objective, as discussed above. The table summarizes the general processes users engage in to satisfy an information need based on the analysis of the literature.

Table 1 Summary and Contribution of Theory/Models to Study Focus

Theory/Model	Summary	Relevant component	Relationship to current study
Taylor (1968) Levels of Information Need.	The theory is more practically oriented; it’s built to fit into the library context on question negotiation and In fact, it can be easily applied in the myriad new ways that users seek information today.	Visceral & Conscious Needs.	Visceral & Conscious need are among the components Taylor’s theory portrayed that fit into the current research. With a <i>Visceral Need</i> the individual knows something is wrong or missing, but it’s currently hard to pinpoint; With a <i>Conscious Need</i> ; user realizes that he or she is missing information and can try to articulate it.
Dervin (1972) Sense Making.	The Sense-Making Approach describes how	Cognitive gap.	The theory identifies three ways or

	<p>a user proceeds but might stop completely when he or she realizes that there is a gap in their knowledge, or “cognitive gap,” and cannot move forward again until he or she bridges the gap with knowledge.</p>		<p>processes involving the situation gap of information seekers. The model is helpful and provides a suitable framework at which the rural community may get stuck as result of health information gap in the process of information searching. .</p>
<p>Belkin (1977) Anomalous state of knowledge.</p>	<p>The idea of information-seeking originates with problem and the information need to solve the problem.</p>	<p>Anomalous state of knowledge.</p>	<p>Belkin’s theory is applied to a real-life problems and psychology of people’s behavior. It involves the cognitive process where information forms knowledge. The psychological undertone in the model will greatly help in the current study understanding the rural community social and behavioral interaction.</p>
<p>Ellis (1989) Information-seeking Behavior Process.</p>	<p>Ellis’s model is from a grounded theory approach in 1989 and found that the interaction between any two features of his model depended on the situation in which a person with information need found himself or herself, and no matter what the circumstances were, the process must begin with “Starting” features and “Ending</p>	<p>Starting and Ending process.</p>	<p>Ellis’s model can be applied to many empirical situations in a different multiple studies of domains (Jarvelin & Wilson, 2003). The model indicates six features in making judgment of accessing information as user engage in various strategies of information-seeking</p>

	<p>“features. The model appeared to be between the micro- and macro-analysis of information, meaning that this model could be applied to different levels of the information-seeking process.</p>		<p>patterns. The model is recognized to have been widely used by scholars in the field of social science; this reason supports its relevance to current study in which various study similar to the current study has use the model and tested.</p>
<p>Savolainen (1995) Everyday life information-seeking (ELIS).</p>	<p>The Everyday life information-seeking (ELIS) Model of Savolainen’s demonstrated the role of value, social and cultural factors in information-seeking as user have cognitive order of information seeking. The model involves “nonwork” activities related to action of information behavior that previous models had neglected; this includes shopping, taking care of our home, our personal interests, pursuing our hobbies, etc.</p>	<p>Everyday life information-seeking ELIS.</p>	<p>The model is more incorporated with sociological and cultural concepts because of its nature of studying the personal behavior of individuals in nonwork contexts. Savolainen’s model is ultimately concerned with what he called “Mastery of Life” (Case, 2012). This idea directly touched the community the current study examines specifically trying to know what their basic information needs and what process they engage in information are seeking. The limitation of the model in spite of direct influence on personal behavior of</p>

			individual, does not examine the connection involve in information-seeking process.
Bates (1979) Berry-Picking Evolving Approach.	The idea of “berry-picking” refers to how individuals pick a berry here and there, then move on to another bush and pick berries from that bush. Over time, there is a basket of berries, but they came from a variety of places; so, too, do people pick information from a variety of sources and gather them together into a unified whole of some kind, this show Information need can be satisfied by the series of information that users acquire during the information search process.	Berry-picking.	This model clearly exhibits the dynamic search process where search queries could change during information seeking. This idea is in line with the possible situation the rural communities the study examines where there will be a possibility that the information-seeking process changes as result re-formulating the search queries.
Xie (2007) Planned Situational IR Model.	The model that illustrates how the plan and situation of an individual user co-determines the user’s selection of information-seeking strategies and the shift in information-seeking strategies as time continues.	Level of user Goal and Level of user Task.	Even though the model is more of a user-centered oriented approach, still it comprises some of the components such as the level of user goal and level of the user task. This clearly helps to determine the problem at hand of the information need the current study is asking the

			rural community as part of the “goal” and how much information they need, which can be summed up to be the level of user “task.”
Krikelas (1983) Information-seeking Behavior Model.	Information gathering and information given, and the model emphasized the importance of uncertainty as a motivating factor offering the potential for an information seeker to find an answer from her/his cognitive memory.	Uncertainty as a motivating factor.	The model helps the current study determine the process rural community members follow in uncertain and urgent situations in gathering the health information they need. The model does not examine issues specific to individual users; it is more general in context.
Kuhlthau (1991) Information Search Process Model.	The model identified six stages in the information search process, incorporating the attributes of feelings, thoughts, and actions for the individual’s information search; for example, Initiation, where the individual is confronted with the task of recognizing his or her need for information.	Information Search Process.	The model examines the user feelings, cognitive thoughts and physical actions, and how to accomplish a task. This idea is central to the current study because the rural community’s anxiety, feelings and physical search processes in finding information is vital to what the study hoped to find. Furthermore, many similar studies related to rural information

			needs, seeking and searching behavior have used Kuhlthau's model.
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Theory & Models of Health Information-seeking Behavior			
Theory/Model	Summary	Component Used	Relevance & Relationship to study Area
Freimuth, Stein, and Kean (1975) model.	The model illustrated a health information seeker's stimulus is derived from within the person's previous experience related to sicknesses, symptoms or injuries or from environment in which a person lives.	Stimulus, information search behavior, information evaluation.	The model is helpful to the current research study where some of the components, including the 'stimulus', 'search behavior' and 'information evaluation' are significant to the rural community research setting, where the components mentioned are exploratory tools aiding the study to acquire relevant information.
Johnson and Meischke (1993) model.	The model, called a comprehensive model of information seeking, describes the four factors affecting information seeking, namely, demographic factors, direct experience of	Demographic and Salient factors.	(Lalazaryan & Zare-Farashbandi, 2014; White, 2016). The model is significant to the current research study. It informs the study of basic demographic factors in the current

	people, salience, and beliefs of people.		study, which include age, gender, education, ethnicity socioeconomic status of the information seekers and salient information which refers to the information gathered by a person not only to satisfy the information need but whether such information is applicable. It acts as a bridge to cover a gap, solve a problem, and remove ambiguities.
Lenz (1984) Health Information-seeking model.	The model illustrated a health information seeker's stimulus is derived from within the person's previous experience related to sicknesses, symptoms or injuries or from environment in which a person lives	Stimulus, information goal, decision making, and itemized search behavior.	Lenz's Information-seeking model is directly related to the current research study at which rural health information-seeking are derived from within the person's previous experience related to sicknesses, symptoms, or injuries.
Miller (1989) Monitoring and Blunting hypothesis.	The model refers to coping styles of people when they face life-threatening situations. When a seeker of information is confronted with a life-threatening health situation, he or she will engage in the search of massive amounts of information related to their current situation.	Life-threatening situation.	The model further refers to users who refuse to actively engage in seeking information when faced with critical situations in their health status and are exposed to more danger. This relates to the processes rural community engage in.

<p>Lazarus and Folkman (1988) Stress and Cognitive Appraisal Theory.</p>	<p>Individual's response to stress depending on how threatening the stress is.</p>	<p>There are two types of coping: problem-focused and emotion-based.</p>	<p>Lazarus and Folkman's Theory the model is relevant to the current study as it presented coping processes related to health issues, which include problem-focused and emotion-based processes. The former focuses on the how people concentrate more on the problem at hand and try to take action in solving the problem while the latter addresses how individuals seek to reduce the negative feeling as result of a stressful situation.</p>
<p>Longo (2005) Model of health information-seeking behavior.</p>	<p>The model includes two factors: (1) personal factors, including demographic and socioeconomic factors such as health history, genetics, anxiety, status, cognitive abilities, interpersonal communication motives, and (2) contextual factors, including health situation, health care structure, delivery of health care, information environment, information-seeking for self, family member or friend, and data risk with current medical problems.</p>	<p>(1) Personal factors, and (2) contextual factors.</p>	<p>Longo's model helps the current study to understand the sources and usage of health information related chronic disease as it explains the process nature, source and usage of health information. The model is widely applied more to qualitative data investigation especially in information-seeking behavior similar to the current study.</p>

<p>Prochaska & Velicer (1997) Transtheoretical Model (TTM) of health behavior.</p>	<p>The model deals with changing patterns of how to transform people and help them be healthier. This includes advising people to quit health-threatening practices such as smoking or eating unhealthy food and encouraging healthy habits.</p>	<p>Behavioral pattern of changing and quitting health-threatening practices.</p>	<p>The model provides the framework of prevention measures. This is relevant to the current research where health behavior changes for people of chronic disease are advised to quit health-threatening practices. Rural communities follow certain practices when dealing with emerging diseases.</p>
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2.3 Significance of Information for Rural Communities

Information is considered the first step to every health choice, as full access to information about the human body, one’s own health and illnesses, and the health services available is critical (Gann, 1991). Cheunwattan (1998) reported that there is not enough empirical research data that discusses rural information needs and the information-seeking habits of rural community residents, and we know very little about the information services that are provided to the community in areas with limited library and information services. Thus, we cannot know if the services offered are relevant and appropriate (Cheunwattana, 1998). Punch (1994) and Silverman (2013) reported that information is a key contributor to the development of individuals and communities. The community-based literacy initiative and programs help to promote the transfer of knowledge and skill between various type of generation (Henderson, 2014). People need information to develop their potential through education and training, to succeed in business, to enrich their cultural

experience, and to take control of their daily lives. Furthermore, information brings about knowledge, and through knowledge, the community can better develop itself (Kamba, 2009).

Information is perceived as an important resource that contributes immeasurably to the development of a nation, bringing about knowledge and knowledgeable communities (Islam & Ahmed, 2012). In addition, communities cannot develop without appropriate access to good information, because access to appropriate information by rural communities could help residents to acquire knowledge and the confidence to participate in community affairs. Further, the majority of people in Africa and Asia live in rural areas; their information needs are distinct from those of urban dwellers. The current literature reviewed indicates the need for further research into different areas of rural information need and information-seeking behavior in both developed and developing countries (Islam & Ahmed, 2012).

2.3.1 Information Needs, Seeking and Searching Behavior of Rural Dwellers in Developed Countries

Various studies have been conducted related to information-seeking behaviors in developed countries such as the United States, United Kingdom, France, and Australia. One such study by Barron and Curran (1979) assessed the general information needs of residents in rural southern communities in the United States for effective planning of library services in meeting users' information needs. The study identified 14 different fields of information needs in rural areas, such as transport, entertainment, education, utility services, health, legal matters, jobs, social security, taxes, rental rates, shopping, country planning, housing, and pensions. Another study by Wilde (1981) (cited by Islam & Ahmed, 2012) identified six major information needs of rural residents of western United States communities, such as community planning, small business

management, family health and nutrition, legal information regarding federal laws, and information on agriculture and agricultural practice.

In addition, various studies conducted in the United Kingdom confirm that information services in rural areas were associated with obtaining and changing jobs, housing and households, personal matters, income maintenance, education, and school (Bishop, Tidline, Shoemaker, & Salela, 1999; Borrie, 1982; Clark & Unwin, 1980). In his work on rural information needs, Vavrek (1990) stated that rural communities are associated with poverty, isolation, inadequate service, and inequality, and because of this, the level of information need becomes greater than expected. Similarly, Partridge's thesis (1991) studied the communication behavior of farmers in rural areas of western Australia to assess the role of the local public library in meeting their information, educational, inspirational, and recreational needs. Bishop et al. (1999) carried out a study of low-income communities in Illinois and identified their information need tied to community services and activities such as legal and city services, leisure and local activities, resources for children, health care, education, employment, crime and safety, and general reference tools.

The rural/urban divide is not limited to the United States. In France, Giraud, as cited in Anwar and Suppat (1998), identified the information needs of rural areas in a study including training in agricultural affairs, craft work, local history, topography, culture, and daily useful advice. Also, a study conducted in rural Australia by Rochester and Willard (1996/98), as cited in Islam and Ahmed (2012) stated that in Australia, a country where most people live in large cities in the east and southeast coastal areas, most of the information needs of rural dwellers are not the same as those of urban dwellers. There are few differences in community groups, as the breadth

and intensity of information needs of rural dwellers are not as much as those in urban areas due to fact that most people in Australia live in cities.

Another study conducted in the U.K. identified the information needs of rural populations in Shetland in the northern part of the U.K., including health and safety, community care, education, employment, housing, consumer issues, legal problems, new and current affairs, and local events and activities (Marcella & Baxter, 1999). Similarly, information needs of some residents in a small village in the north of England were associated with day-to-day activities. In addition to that, everyone is considered the seeker and user of information in everyday life (Johnstone et al., 2004) because people seek out and use information constantly as part of their daily life, relating to any aspect of their life condition.

Still, there is hope for rural residents. Another survey conducted on information-seeking behavior and the needs in rural populations of Indian residents of Barak Valley indicated there have been improvements in information services in rural environments. The study stated that it is necessary to make a public library available in every rural village, and to make rural people aware of the need for and importance of the library (Ahmed, 2015). Similarly, Wathen and Harris (2007) studied how 40 rural women living in rural southwestern Ontario, Canada, searched for health information. The findings revealed that the women's information-seeking was associated with and influenced by contextual factors such as rural living and gender roles.

With regard to health, every person needs, seeks, and uses health information in various ways directly or indirectly—directly from the various processes of inquiring about information from persons, health care institutions, and medical personnel (doctors, nurses, and midwives), and

indirectly by receiving information from other sources, from media or intermedia, and persons engaged in passive searches (Yusup & Komariah, 2014).

2.3.2 Information Needs and Seeking and Searching Behavior of Rural Dwellers in Developing Countries

Having discussed information needs and seeking and searching behavior in developed countries, it is more relevant to the present study to look further into research conducted in rural areas of developing countries, with Nigeria being a particular focus. There have been many studies of information needs in developing areas of the world, including parts of Asia and Africa.

Sarada (1986), cited in Islam and Ahmed (2012), examined rural library services in India and found that information needs are centered on daily life, including food and nutrition, childcare, family welfare, credit, and market facilities. Similar studies related in India conducted by Dasgupta (2000) identified that rural dwellers' main information needs are related to the issue of survival, including food, nutrition, and health care; law and order; economic activities; and education. Chakrabarti (2001) investigated the information-seeking behavior of the Totos community in Totpora in sub-Himalayan West Bengal, India. The survey revealed different information needs, including information on nontraditional housing, information for their personal knowledge, and information on pure drinking water and pure bathing water. Das and Khan (2004) identified information needs among the rural communities in West Bengal, India.

Another study by Chakrabarti (2001) used a similar information-seeking behavior approach by rural dwellers in West Bengal, India. The findings of that study are almost identical to those of Das and Khan; the findings included specific information needs related to daily activities such as occupation, health care, sanitation, housing, transport, facilities, employment,

legal aid, and banking rules. (Islam & Ahmed, 2012). Iqbal (2003) carried out a study on the information needs and information problems in rural areas and urban settlements in Bangladesh. His findings identified that information needs related to rural and urban slums are very similar, which included farming, family planning, financial or loan assistance, flood control or natural disaster management, and health-related issues.

Anwar and Suppat (1998) conducted an investigation of the information needs of people in rural Malaysia; the needs were broadly related to religious information, family bonding, current affairs, health information, education, bringing up children, dietary information, agriculture, etc. The study also highlighted the sources of the information, which included TV, radio, friends and neighbors, printed material, school consultation with Muslim leaders or imams, etc. Another information-seeking and needs study conducted in Thailand by Cheunwattana (1999) found that information needs are in relation to the information infrastructure already present; they include social welfare and their current situation, health and hygiene, and inspirational content. Seneviaratne, Gunawardene, and Siddhisena (2006) surveyed the information needs of rural communities in Sri Lanka, which included agriculture, education, employment/labor, finance, government information, health and nutrition, industrial infrastructure, legal information, employment/training, and weather.

Temu (1984) studied the information needs of two Papuan village communities, Kapari and Viriolo, in Papua, New Guinea. The study showed that the main information needs identified among the communities were related to the improvement of small-scale economic development and community welfare. Similarly, Musib (1989) conducted a survey on the information needs and sources of rural dwellers related to agricultural work. He tried to identify the source of their

information needs and found education, health, rent, tax, personal relations, politics, recreation, employment, etc., were among their basic needs. He also had similar findings from research conducted in rural India years later, where he found locals engaged in wooden, bamboo, and earthenware cottage industries.

There have been a number of information needs and seeking studies focusing on specific areas of Africa. Bosompra (1987) studied the sources of health information among rural dwellers in Africa in a case study of two Ghanaian villages. Other studies include Akonga (1988) and Kaane (1995), who studied the dissemination of various facets of health information among the residents in rural areas in Ghana, Malawi, and Kenya. Similarly, Ojiambo (1990) examined how agricultural scientists and extension workers communicated information among themselves in Kenya. Kaniki (1991, 1995) also attempted to establish the agricultural information needs of farmers in rural areas around Zambia and urban centers in Zambia, with the results indicating that community information included health, occupations, problems of daily existence activities such welfare and energy, employment opportunities, education, small-scale economic development, social welfare, housing, and political and social rights. At a later stage, an exploratory study was conducted of two rural communities in South Africa that assessed their information needs using the critical incident approach (Kaniki, 1991, 1995). Mchombu (1993) carried out a study of the information needs of rural dwellers in Malawi, Botswana, and Tanzania; their information needs were shown to relate to income, community leadership, literacy support, basic economic government policies on rural development, soil conservation, fertility restoration, and soil erosion.

The Bii and Otike (2003) case study of the Bomet district on the provision and accessibility of health information to the rural communities in Kenya reported rural community residents had

many information needs, most of which were directly related to their health problems. Also, an information study assessment was conducted in Oribi Village, Pietermaritzburg, in the province of KwaZulu-Natal in South Africa. The study showed significant needs for information concerning fundamental issues such housing, health, and education, agricultural-related issues, small-scale industries information, employment, education, health and family welfare issues, credit and insurance, availability of cheap nutrition, and self-employment (Zaverdinos-Kockott, 2004). Similarly, Mooko (2005) investigated the information needs and information-seeking behavior of uneducated rural women and their families in three villages in Botswana. The study found their needs were largely health-related, such as information related to diseases they had contracted and how they are treated, as well as information related to job opportunities and training, agriculture, family violence, and basic information needs for the family, such as education, financial assistance, etc.

Another study, conducted by Odongo (2009), investigated the information needs associated with informal economics sectors in Uganda. The findings of the study indicated that people in the informal economic sectors found it difficult to access information. Their information needs were associated with the context of their profession. The study also concluded that the most relevant means of accessing information were by word of mouth and through interpersonal contact, personal relationships, experience, radio, and newspapers. Similarly, Zhang and Cheng (1996) investigated information provisions to rural communities in China, revealing a variance of distinction of information needs among different communities examined based on quantity, timeliness, medium of information channel of communication, and method of information dissemination.

2.3.3 Health and Information Needs, Seeking and Searching Behavior of Rural Dwellers in Nigeria

Having discussed earlier the information needs in addition to the seeking and searching behavior of some rural communities in developed and developing countries, it is pertinent to the current research study to examine studies that discuss the information needs, seeking and searching behavior of rural dwellers in Nigeria as the main target area of this project. Some of the studies that discussed rural information-seeking in Nigeria include the study of Aboyede (1984), which involved an experimental library project set up in a village near Ibadan, Nigeria, for the non-literate community to gain insight into local information needs. The study identified some of the needs, including health and sanitation, agricultural production, government policies and programs, occupation, recreation and leisure, literacy, Islamic religious literature, childcare, and many others.

Aina (1985) studied the agricultural information needs of farmers in southwestern Nigeria in her later study and identified that the information needs included control of major pests, books and journals related to agricultural research, credit and cooperatives, proper handling of insecticide, and marketing of agricultural products. Furthermore, an unpublished thesis of Dekur (1996), cited by Njoku, did an analysis of the information needs of rural fisheries in Buguma Rivers, Nigeria, revealing similar findings: that most information needs of rural fishermen related to how to obtain loans and credit to expand their operation, marketing their products, government policies on the use of chemicals for fishing, effects of oil pollution, and the lives of aquatic animals.

Likewise, Njoku (2004) studied the information needs and information-seeking behavior of illiterate, married, middle-aged adult male fishermen in Lagos, Nigeria. The findings revealed that the information needs of those fishermen were mostly occupational in nature; the main sources of their information included colleagues, friends, neighbors, and relatives. The study further

revealed that the most common problem in information-seeking in the area was the lack of accurate and reliable information as well as technology to adopt new techniques to improve their fishing occupation.

Ukachi (2007) also surveyed the information needs, sources, and information-seeking behavior of rural women in Badagry, Nigeria. The author concluded the rural women required basic information, including that related to security, self-help, self-reliance, and entertainment. Saleh & Lasisi (2012a), who studied the information needs and information-seeking behavior of rural women in Borno, Nigeria, reported that women constituted the highest percentage of rural dwellers in Nigeria. The channels of information they used were mainly informal—friends, relatives, husbands, children, and market women. The study further examined information needs in the area of agriculture, health, education, economy, and politics. Information needs related to agriculture (53%) and health issues (20%) were the most prevalent. This showed that their information-seeking was more influenced by their socioeconomic status and special health issues, as they mentioned how to manage vascular vaginal fistula (VVF) and how to safely deliver pregnancies (Saleh & Lasisi, 2012b).

Another study of the information needs and information-seeking behavior of rural dwellers in Nigeria by Mommoh (2002) involves a case study of Ekpoma in Esan, the west local government area of Edo, Nigeria. Mommoh found the information needs of the Ekpoma people varied widely by occupation. Those studied included farmers, petty traders, artisans, blacksmiths, weavers, fishermen, teachers, postmasters, and adult learners. Another study examined information accessibility for rural women in Nigeria (Iwu-James, Idiegbeyan-Ose, Ifijeh, Segun-Adeniran, & Esse, 2019). The study identified some channels and preferred sources of information

the rural women relied on. The study further revealed the women's inability to access and harness agricultural, health, and social services information. The study recommended strategies for improvement with regard to quality access to information.

2.4 Research on Consumer Health Information

Consumer Health Information (CHI) is a form of information made accessible to patients regarding health that is used by a layperson; it is simplified from the types of information available to medical professionals (Stavri, 2001). Health- or care-seeking behavior concerns the actions an individual undertakes when they have a health problem or illness in order to find the appropriate treatment. Olenja (2003) reported that CHI has been described as information on a continuum between health education and health promotion. Therefore, access to health information contributes to health education and promotes healthy lifestyle choices (Adeyoyin & Oyewusi, 2015). Another way CHI can be spread is through various communication channels, including health care professionals, friends, and media, such as telephone hotlines and the Internet.

2.4.1 Consumer Health Information Needs and Seeking and Searching Behaviors

Individuals' health problems or sicknesses, or that of their relatives, greatly influence and trigger their active involvement in information seeking. The availability of CHI has been increasing dramatically over the last 20 years and is not just sought out by patients with a given condition. As Mackay observed, "Everyone is a consumer of health information [because] it includes information on specific illnesses and conditions, on good health and the prevention of illness" (Mackay, 2000, p. 69). Similarly, consumers, caregivers, and professionals engage in interactive health information-seeking via the Internet (Cline & Haynes, 2001; Fox, 2013b; Priest et al., 2016). This behavior had been commonly practiced because consumers find that online

medical information posted by sites such as Medline and Healthfinder.gov is written by actual doctors and other medical personnel and, therefore, is trustworthy (Eysenbach, 2003; Gregory-Head, 1998; White, 2002).

Among the issues discussed in the literature is the evaluation of patient experiences in health information searching among Health Consumer Organizations (HCOs). In order to provide an Internet searching platform, the HCOs are saddled with the task of shaping patients' positive assertiveness toward online information flow by allowing open conversations, incorporating design features for content rating, and associating with social networking sites such Facebook and LinkedIn (Nambisan, 2011a, 2011b; Nambisan, Gustafson, Hawkins, & Pingree, 2016). Numerous studies related to consumer health information-seeking behavior, such as individuals seeking CHI, are varied based on the type of illness or health condition of concern, as may be seen in the following discussions.

A patient's current health status dictates the kind of information needed and what types of information-seeking activities the patient pursues (Carlsson, 2000; Huber & Cruz, 2000; Rees & Bath, 2000). In the health information-seeking context, individuals are found to be engaged in a variety of information-seeking tasks that depend on the situation in which they are involved. For example, women frequently seek information regarding their reproductive health, including pregnancy, menopause, menstruation irregularities, and pelvic floor disorders. Women are not only interested in health issues regarding their reproductive systems, however, as they seek information regarding urinary tract health, cancer, AIDS, anemia, sickle cell anemia, asthma, arthritis, eye problems, and so on. Therefore, while women do seek information about so-called women's health issues, they will also explore areas that are problematic for both women and men.

Similarly, men are interested in finding information related to their specific health issues as well as issues affecting both men and women. Reports confirmed that the rate of men's deaths is higher compared to women's among those affected with the top 10 sicknesses, including heart disease, cancer, stroke, chronic obstructive pulmonary disease, accident, pneumonia and influenza, diabetes, suicide, kidney and chronic liver disease, and cirrhosis (WebMD, 2005; "What health issues or conditions are specific to women only?," n.d.).

How people study is as important as what they study. For example, cancer patients have a certain degree of seriousness with which they seek information about their particular cancer treatments (Jimbo, Nease, Ruffin, & Rana, 2006). Furthermore, the more patients feel that they have to take care of themselves rather than check into a hospital or have nursing care, the more likely they feel that they need to be informed so that they can make effective decisions, and thereby will seek considerable information from any resource available, including the Internet (Rees & Bath, 2000). Patients can cope with a cancer diagnosis in many ways.

One study found that responses to cancer diagnosis can now be somewhat predictable using the Monitor-Blunter Style Scale, allowing medical personnel to help patients to receive information in such a way that is consistent with the way people cope considering their specific coping profile (Miller, 1995a). Miller's research further suggests that knowing cancer patients' coping profiles can help to determine how much or how little information patients really need. However, because this research was conducted during the early years of the Internet, one wonders how the plethora of information available now is impacting patients whose profiles require less information. Increasingly, patients go beyond doctors for information (Dutta-Bergman, 2005). Furthermore, not all patients are interested in finding as much information as possible, as they

sometimes want to rely more on hope, and that can be impacted by being overwhelmed with information (Yuan & Belkin, 2010).

In fact, avoiding health information can be a coping mechanism, as it avoids the risk of encountering a negative result, generating emotions such as fear, anxiety, and depression (Sairanen & Savolainen, 2010). A study conducted to determine the health-information-seeking behavior of urban and rural Peruvians reported there were apparent differences in the way urban and rural Peruvians obtain information related to health issues; individuals sometimes passively, as well actively, sought health information (Garcia-Cosvalente, Wood, & Obregon, 2010). The study indicated the Internet was regarded as an active means through which people made a conscious effort to acquire specific health information; passive channels of communication were also used.

The Internet health information-seeking experience is probably influenced by age, lifestyle, trends, and typical health status as well as changes that occur as a result of any disease or health issue (Ybarra & Suman, 2008). Ybarra and Suman further stated that adolescents were more likely to use the Internet to seek information for themselves personally, whereas middle-aged people were more likely to investigate the health needs of loved ones. These findings are supported by Andreassen et al. (2007), who stated that in Europe, the most active health users were in the 30 to 44 year old age range. Lorence (2006) reported that 77.3% of reported health information-seeking searches were conducted on behalf of loved ones. Moreover, consumers found to be actively engaged online were doing so in different ways (Sorensen, 2008), such as in deciding whether they needed to see doctor at all (Fox, 2011).

It was also reported that an individual's personal health care and illness prevention contributed greatly to the process of health information-seeking behavior (Loiselle & Dubois,

2003). Researchers and clinicians alike were interested in understanding how and why individuals engaged in health information seeking: what they intended to retrieve, what particular type of information they preferred, and how the health information they sought was being used. Most of the studies revealed that consumers engaged in personal, health-related information-seeking (Lambert & Loisel, 2007).

Levels of differences in patient information-seeking searches existed among consumers (Ferguson, 1992), such as applying personal belief to searches for additional health information. Moorman and Matulich (1993) also stated that searches were rampant related to diagnosis and personal desire for treatment information. This was also confirmed by the PEW research study on The Internet and American Life Project conducted in 2000, which noted that searched information might influence medical decision making and help consumers to manage their own care. Moreover, research has confirmed that behavioral changes are more likely to occur based as the result of interpersonal, rather than mass, communication (Piotrow, Kincaid, Rimon, Rinehart, & Samson, 1997). In other words, if a patient receives information from another patient with the same diagnosis and treatment and prescribed medication, it is more likely the other patient will ask for the same prescription or medication from his own doctor.

Similarly, a study by Nagler (2010) on information-seeking among breast, prostate, and colorectal cancer patients found that these patients had numerous information needs and used a variety of sources to satisfy these needs. While it would be expected that patients actively sought out information, they also reported stumbling across it, even when they were not looking directly for it. Perhaps medical information is so prevalent nowadays that we “tune it out” and ignore it unless we’re actively looking for it. For example, Kim (2015) found that people who are relatively

healthy do not seek out health information, which suggests that either they do not seek it or they are not noticing when they find it. Kim's study suggests that people actively search for information on health concerns when they are looking into a diagnosis, proper medication, and other health concerns for a condition they are interested in learning about. It makes sense that in today's information-laden society, health consumers would quickly become health seekers.

A consumer patient who has a chronic health condition wants to be more informed about his or her health and thereby finds information in such a way as to manage and address their health conditions (Lee, Hoti, Hughes, & Emmerton, 2015). One big shift from the early studies is that more people are using social media to share and discuss their health information and experiences (Song et al., 2016). Individuals can easily and comfortably share their similar experiences related to health issues, and this includes the use of blogs, social network sites, and online health support (Song et al., 2016).

Online health consumers tend to be more educated, earn more, and have high-speed Internet access at home and at work. The transition of cancer diagnosis and the level of the sickness manifestation has greatly influenced how much and what information a patient desires (Mills & Sullivan, 1999). A study of the information-seeking behavior of cancer outpatients found that cancer outpatients were influenced by several factors, including patient need, value, and belief, unexpected situation, patient skill, specialist, and companion behavior (Borgers et al., 1993). Another study on consumer disease information-seeking behavior on the Internet conducted in Korea attempted to explain the relationship factors that affect consumer information-seeking by conducting a survey. The survey found that the Internet health information used influenced

consumer beliefs, attitudes, and intention of use of disease information on the Web (Yun & Park, 2010).

One reason why seekers might search information online is because they have only “weak ties” to the medical profession, whereas they have stronger ties to their family and friends and thereby trust them more. However, a study exploring the health information-seeking behavior of African-Americans, which used Granovetters’ Strength of Weak Ties as the theoretical framework, discovered that having a somewhat close relationship with a health care professional gave them enough of a connection to consult the doctor first, followed by the website, when they wanted to seek medical advice (Morey, 2006).

A study exploring Internet use by 251 women with breast cancer being treated at a university-based hospital found that Internet users differed from non-users by income level, educational level, and race/ethnic background, and that white patients and those with the highest economic status or education were most likely to use the Internet (Fogel, Albert, Schnabel, Ditkoff, & Neugut, 2002). This study was corroborated by another study that focused on a sample of 800 reproductive-age women between 15 to 49 years; the study revealed that socio-demographic variables had great impact on information-seeking patterns, as did educational level (Hussain et al., 2011). A sample of 2,478 migrant workers in China, chosen by a multi-stage stratified cluster sampling method, using a structured questionnaire and face-to-face interviews between investigator and the subjects, found that the high cost of health service was a significant obstacle to health care information access to the 40.5% of migrant workers who became sick. The study further showed 94.0% of migrant workers did not have insurance to cover their health care, making health care potentially very expensive; this, therefore, indicated that the health information-seeking

behavior was greatly attached to their level of income per capita and the number working hours per day. Monthly income per capita and working hours per day also affected the medical visitation rate (Peng, Chang, Zhou, Hu, & Liang, 2010).

Oh and Kim (2014) conducted an exploratory study comparing college students' use and perception of social media for health in the U.S. and Korea. The study's sample of 342 college students from two universities identified American students as using more social media in searching health information in comparison with their Korean counterparts. Furthermore, demographic and socioeconomic structure and cultural disparities were among those issues that the study identified.

Another study reported that socio-demographic and economic characteristics, health knowledge level, and health communication channels were identified in the study of ethnic minority patients with chronic illnesses who sought allied health services. The results further revealed that the active health services of Chinese ethnic minorities were clearly associated with the communication channels used for acquiring the information. (Tang et al., 2015). Another study of the effect of race/ethnicity and socioeconomic status on health information-seeking to monitor the influence of race and ethnicity and socioeconomic status in health information-seeking revealed that those with a lower education status were less likely to seek health information along with those having lower incomes (Richardson, Allen, Xiao, & Vallone, 2012). Regardless of circumstance, consumer health information should be simplified so that users can easily find the data, just as Mu and Lu (2011) confirmed in the test study of a user interface with a health information domain. Their study confirmed that consumer and biomedical interface design were very important to searching behavior.

2.4.2 Consumer Health Information Needs, Seeking and Searching Behavior in Nigeria

Few studies have reported findings related to consumer health information needs and seeking and searching behavior in Nigeria, most especially the focus area of the current study that focuses on the tsetse fly and mosquitos. Some of the current studies conducted in Nigeria have cut across different types of diseases and can be seen in the following discussions. A study of the information needs and seeking behavior of rural women in Borno, Nigeria, revealed several areas of interest, including agriculture, health, education, economy, and politically related information (Saleh & Lasisi, 2012a). Agriculture and health issues were most frequently reported, 53% and 20%, respectively. This shows that the rural women's information-seeking was influenced more by their socioeconomic status and special health issues, for example managing vascular vaginal fistula (VVF) and safely delivering pregnancies.

Another example was the 2007 survey by Abdulraheem (2007) of health-seeking behavior among elderly Nigerians; it surveyed 756 households to determine the health-care-seeking behavior of people aged 60 and above. The author found that socioeconomic status and the special nature of illness were the most pervasive determinants of health-care-seeking behavior among elderly men. Furthermore, Adeoye and Popoola (2011) conducted a study on the effectiveness, availability, and accessibility of users of library and information resources among the teaching staff at a school of nursing in Osun and Oyo, Nigeria, investigating what influence the availability, accessibility, and use of information had among the group. The findings identified that teaching effectiveness had a strong correlation with education, qualification, availability, and accessibility of library resources.

Albright (2007) conducted a study of HIV/AIDS information-seeking and health care communication in sub-Saharan Africa, providing an overview of the status of HIV/AIDS in sub-Saharan Africa, including Nigeria. Likewise, Aderoto and Oyefuga (2010) conducted a study to examine the relationship of information needs of persons infected with HIV in Ijebu-Ode, Nigeria. Popoola (2000) also studied consumer health information needs and services in Nigeria. The study is considered unique in identifying the information needs and resources among 250 respondents examined around the country. Their health information needs and services were related to health institution services, child and maternal care, drug administration, and family planning. She confirmed the information available was unable to meet the consumer demand.

Idowu (2008) conducted a study somewhat similar to information seeking, but on health information, by reviewing the past and present statistics on health informatics in Nigeria. Access to health information by people living with HIV/AIDS in Nigeria was another study conducted by Edewor (2010); it ascertained the challenges of access to health information among people living with HIV/AIDS (PLWHA) in Nigeria. The study revealed information needs including ARV medication, drug availability and affordability, NGO (Non-Governmental Organization) activities, human rights, antiretroviral (ARV) trial centers, care and support, nutrition, foreign aid, and medical health officers. Also, a study of Adewale (2004) on Internet-based telemedicine systems in Nigeria discussed how the Internet-based telemedicine environment was developed to specifically support consultation among remotely placed patients, rural health workers, and specialists in urban cities, and provided secure access to remote patient records.

Uzochukwu (2004) also conducted a socioeconomic study of differences in health-seeking behavior for the diagnosis and treatment of malaria in four local governances in southeast Nigeria.

Some of the results indicated a socioeconomic differential in the incidence of malaria occurrence and showed no differentiation between the respondents in which patients were more likely to use a laboratory for the diagnosis of malaria. Nwagwu (2009) studied the information needs and seeking behavior of nurses at the university college hospital in Ibadan City, Nigeria, reporting the lack of access as a major inhibitor of the use of the sources. The study suggested establishing an information center/library, also suggesting computer literacy skills would enhance information-seeking behavior.

Adegboyega (2004) discussed the care-seeking behavior of caregivers for common childhood illnesses in Lagos Island, Nigeria, to determine the behavior of mothers and caregivers regarding related illnesses. Out of 450 mothers and caregivers identified, 87% were revealed to have symptoms of malaria, acute respiratory infection, diarrhea, and measles. Fawole et al. (1999) highlighted a Nigerian school-based educational program related to AIDS; the results concluded that students can benefit from specific educational programs that transmit information to prevent in engaging in risky behavior, thus improving knowledge and attitudes toward HIV and AIDS. A study of pulmonary tuberculosis in Lagos indicated an urgent need to educate communities and care providers on the cause and mode of transmission of tuberculosis for earlier diagnosis and proper treatment (Enwuru, Idigbe, Ezeobi, & Otegbeye, 2002).

Agu (2005) also conducted a similar study of mothers' perception and treatment-seeking behavior related to childhood malaria in Ebonyi, Nigeria. The results revealed a low level of awareness of mothers of the causes of malaria and that this poor treatment-seeking behavior contributed greatly to the problem. Van et al. (1998) conducted a study of the help-seeking behavior of leprosy patients in Adamawa, Nigeria. It identified that some of their information

needs were related to the use of folk healers, who claimed to have a positive attitude toward modern medicine in the case of leprosy. Okereke (2010) also studied the health information-seeking behavior of adolescents who had issues of unmet reproductive health needs in Owerri, Nigeria. The findings revealed accessible and cost-effective approaches for disseminating sexually transmitted disease (STD)/HIV information using vernacular and traditional methods.

Similarly, Okeke and Okafor (2008) studied the perception and seeking behavior for the treatment of malaria in rural Nigeria and the implications for control. The study was conducted in Ugwuogo-Nike, a rural community in southeast Nigeria, where some of the behaviors exhibited included knowing the symptoms of malaria and self-treatment, and the application of chloroquine drugs, which was accepted by the majority as an effective treatment. Also, the use of herbal medicine was identified to be common in most communities versus utilizing modern drugs.

Temin et al. (1999) studied sexual behavior and knowledge of sexually transmitted diseases in adolescents in Benin, Nigeria. The use of media campaigns to educate adolescents on the use of condoms and the need to educate parents about reproductive health and communication were among the issues the study revealed. Rabiou et al. (2010) also studied the understanding of health information-seeking behavior regarding female reproductive tract infections. The findings showed most women with RTIs sought treatment during symptomatic stages and demonstrated poor understanding of the subject.

Oduanya (2004) conducted a study on pulmonary tuberculosis, examining the pattern of information time intervals from onset of symptoms to initiation of treatment. The study revealed that patients did not present early behavioral sequences to health facilities regarding their infection.

Enato et al. (2009) studied the prevalence of peripheral parasitemia, anemia, and malaria care-

seeking behavior among pregnant women attending two antenatal clinics in Edo, Nigeria. The results revealed that the majority of the pregnant women were anemic, indicating that an effort to improve antimalarial health care among the pregnant women needed to be intensified.

Also, Ukwaja et al. (2013) further conducted a cross-sectional study on health care-seeking behavior among patients with tuberculosis in rural Nigeria. Their findings were similar to Odusonya (2004), as the needs were related to improving access to health care, education of patients, engagement of information care providers, etc. Finally, an interesting study by Esimai and Omoniyi (2010) highlighted the awareness of menstrual abnormality among college students in urban areas of Ile-Ife Osun, Nigeria, showing how the history of dysmenorrhea and academic disturbances had a significant influence on the health information-seeking behavior of the students.

The body of research on the information needs and information-seeking behavior of people living in developing countries related to health patterns is enormous, as it encompasses a plethora of important, but different, areas of health-related issues. Therefore, the dimension of each research study differs even though there may be similarities in the approach to subject identification.

2.5 Summary

This chapter has defined the overall concepts of information needs as well as seeking and searching behavior in information studies. The chapter also discussed some of the general and health-related theories/models used in information need and in seeking and searching behaviors studies. Furthermore, the chapter highlighted relevant studies on rural information needs and seeking and searching that have been conducted in developing and developed countries. Additionally, it identified different categories of consumer health information needs and seeking behavior literature associated with major health-related diseases and conditions, which includes cancer, diabetes, AIDS, hypertension, and pregnancy, in both developed and developing countries.

Finally, the chapter explored some of the relevant studies conducted in Nigeria related to consumer health information behavior. By and large, the literature outlined in this chapter helped to guide the research and to inform how the study of consumer health information needs and information-seeking and searching behavior of rural residents in Nigeria affected with vector-borne diseases can be conducted.

CHAPTER 3

Methodology

3.1 Research Design and Procedure

This chapter describes and discusses the approach followed in conducting the research, including the concept of the qualitative research method, the advantages of using a qualitative approach, the data collection techniques, the procedure of data collection, the approach to data analysis, ethical issues involving human subjects, and the validity and reliability of the process.

This study of consumer health information needs and seeking and searching behaviors among the inhabitants in some Nigerian rural communities used a qualitative approach to identify and describe the processes undertaken by the residents who have information needs related to vector-borne diseases and have begun searches as a result of those needs. Applying a qualitative approach helps to answer the research questions outlined in Chapter 1.

3.1.1 Rationale for a Qualitative Methodology

Choosing a method of research is very important, as it must determine how to best answer research questions (Punch, 1994; Silverman, 2013). Based on the nature of the research questions, both qualitative and quantitative approaches could be used to gather data, as applying the two methods will be the best in addressing the overall research objective, with a second method supporting a primary method (Creswell, 2012). However, research methods are employed based on the nature of the research problem investigated (G. Morgan & Smircich, 1980), as these methods are concerned with how we can find out what kind of principle, logic, and evidence would be best in learning and acquiring knowledge of an area or object of study. McPhee (1994) stressed that method is one's point of interaction with the world in which the research methods are a

conscious attempt to (collectively) overcome some human shortcoming while promoting dialogue among scholars and research. McGregor and Murnane (2010, p. 420) said, “Methodology refers to how each of logic, reality, values and what counts as knowledge, inform research.”

Qualitative research has its origins in the social sciences and in oral history projects (Robinson, 1982). As people continued using qualitative methodology, it grew in popularity and now has created some of its own evidence-based practice (Denzin & Lincoln, 2005). Qualitative research is a systematic way to investigate certain phenomena involving the process of searching, investigating, or discovering facts about scientific inquiry (Patton, 2005). While it does not involve the types of controls or hypotheses that quantitative research does, it is nevertheless a type of scientific research that attempts to investigate in order to find answers to a question, systematically define a procedure, collect proof, and provide findings; unlike quantitative inquiry, it has room to determine the answers to questions that unexpectedly arise during an investigation (Patton, 2005).

Qualitative inquiry can be conducted in several ways, including participant observation, in-depth interviews, and focus groups; the types of data uncovered in these ways include richer data on a participant’s personal history or experiences (Patton, 2005). Such research goes in such depth that it can provide the data needed to create entire theories, using approaches such as the Grounded Theory Method (Corbin & Strauss, 2014). According to Patton (2005), the strength of a qualitative research study is the ability to provide complex, textual explanations for in-depth exploration of research phenomena. It focuses on the human side of complex issues and is thereby more effective at identifying how intangible factors such as socioeconomic status, gender, ethnicity, and religion can affect the problem being researched (Patton, 2005). It is typically

flexible, as its spontaneity allows interaction with research participants, which can permit follow-up questions when something unexpected is uncovered during, say, an interview (Patton, 2005).

Another description of qualitative inquiry is that it is a form of social inquiry that focuses on the way in which people make sense of their experience of the world they live in. Also, when revealing some of the characteristics of qualitative research, such as the data that are primarily generated, the theoretical framework is derived directly from the data collected; it is context-sensitive, comprises the natural setting, and is considered an emic perspective inside the view of the people's perceptions, meanings, and interpretation (Holloway & Galvin, 2016).

Qualitative methods favor naturalistic observation and interviewing techniques that are applied with a degree of closeness and absence of controlled conditions. Such methods predicate an open system assumption where the observer of the research and the observational context are both part of the study. Qualitative research requires a certain degree of immersion by researchers, and the researcher should be sensitive to the instrument used for inquiry and capable of flexibility with the framework (Padgett, 2016). Qualitative research considers the methods and techniques of observing, documenting, analyzing, and interpreting attributes, terms, characteristics, and specific contextual features of phenomena of the research study (Leininger, 1985).

Qualitative research also enables us to make sense of reality in order to describe and explain social work and to develop explanatory models and theories. It is concerned with developing a description of an observed phenomenon to generate a solid theory. It is used by exploring previous research work (Morse & Field, 1995). By and large, the goal of qualitative research is to document and interpret the expression of people's opinions, which means in general, qualitative research is

all about an approach focusing on identifying a phenomenon and categorizing patterns to provide an explanatory view of the meaning under investigation (Leininger, 1985).

The purpose of using a qualitative approach for this dissertation is to gain an in-depth understanding of participants in rural communities' health information-seeking and -searching behavior. In studies of information needs and behavior, consumers and biomedical professionals sometimes employ quantitative methods, at other times qualitative, and in additional cases studies, may use a mixed-method approach. Nevertheless, a qualitative approach stands to give a more detail explanation of participant response by enabling the researcher to describe and explain participants' information needs and the seeking and searching behaviors of the communities studied. Further, the approach helps to generate theory by grounding that theory in data retrieved rather than verifying theory, as is usually seen in other quantitative research (Tan, 2010), which eventual helps develop explanatory models and theories. In short, it is concerned with developing a description of an observed phenomenon to generate solid theory (Morse & Field, 1995).

3.2 Justification for Using a Case Study

Sometimes case studies function as a way of introducing a concept to others. One example was the case study of a Chinese medical university library, because in China, it is not uncommon for health science librarians at universities to engage in teaching roles, and the authors wanted to demonstrate to the West how this might be done (Clark & Li, 2010). Another study wanted to demonstrate how a particular hospital used a patient management database; this case study occurred at Makurdi General Hospital in Nigeria when they were converting from manual files to the electronic medical record (EMR) retrieval system (Asabe, Oye, & Goji, 2013). Because that

study took place during digital imaging of records, it occurred at a perfect time so that researchers were able to capture the event and thereby help others who were hoping to digitize.

Sometimes case studies can occur in unusual places, such as the case study connected on the point-of-sale multimodal mobile system in Washington, D.C., and in New York City. It explored the implementation strategies and lessons learned from two tobacco point-of-sale surveillance systems to capture information about the tobacco retail environment and test the feasibility of a multimodal mobile data collection system, including audio-video recording data, electronic photographs, and electronic location data (Cantrell et al., 2015). Of particular note was the location in a retail environment, which is a public space where people do not expect much in the way of privacy, as retail stores regularly use video and audio surveillance. This makes such an environment easier to monitor and thereby glean realistic data without seeming suspicious.

Other case studies have been performed in the area of specific conditions, such as the use of a case study to uncover information about the sale of iodized salt in Australia. This particular study was rife with news coverage, which was of benefit, because news coverage of health-related issues has often shown to influence consumer behavior (Li, Chapman, Agho, & Eastman, 2008). Finally, a survey study of patients with advanced-stage cancer at Yaoundé General Hospital in Cameroon attempted to identify patients with cancer who waited before seeking treatment and why they did so. While the study was largely based on a convenience sample of 20 patients that lasted over a three-month period, it was able to determine that patients waited to obtain medical care for many reasons, including a lack of funds and general ignorance about medical care often based on cultural factors or personal fears (Ekortarl, Ndom, & Sacks, 2007). Use of a convenience sample as a method may seem problematic, but in that study, it was likely necessary due to the unique

nature of those who wait to seek medical treatment, as, by the time one finds late-term cancer patients, it might be too late to study them outside of autopsy. Such case studies can gain in-depth information that medical personnel can readily use to prevent future patients from waiting for medical care.

Some studies seem to be prime candidates for case studies, but researchers do not necessarily realize it until they have already completed a survey, for example. One such study focused on inactive health information seekers at Annenberg National Health and Communication Survey (ANHCS); this location would have been sufficiently focused to meet the needs of a case study approach (Kim, 2015). The aim of the study was to identify people who do not actively seek out health information and what such inactive information seekers were like. As part of the process, the study involved an extensive questionnaire, but researchers found relying on survey alone to be limiting and that the study ought to have incorporated a qualitative approach to questions about non-active information seekers (Kim, 2015).

Case study is a method that focuses on one particular location or phenomenon. The case study method is a research method that concerns itself with how or why some event or situation occurs focusing on contemporary events (Yin, 2006). The case study is appropriate when the researcher wants to examine the real-life context of the problem and when the researcher expects there will be more variables of interest than data points (Yin, 2009). It is often utilized in order to provide an in-depth, contextualized examination of social interactions within a single social setting and often used as a research tool to try to uncover phenomena worth studying further in the future (Wildemuth, 2009). For this reason, a case study is appropriate for this research as the study explores a particular rural location, Ladduga, which must deal with the problem of trypanosomiasis

and malaria disease transmitted by tsetse flies and mosquitoes. While the specifics of the case study vary from researcher to researcher, Merriam (1988) has drawn several key characteristics: case studies are *particularistic*, which means they focus on a particular situation, event, program, or phenomenon; they are *descriptive*, which means that the final product will employ thick, rich description of the phenomenon being studied; case studies are *heuristic* because they help the reader understand the phenomenon studied better; and finally, they are *inductive* because they explore data in context to form generalizations, concepts, or hypotheses. These features of case studies allow researchers to gain an in-depth understanding of resident health information needs, seeking and searching behavior. Consequently, the use of a case study approach for this study is appropriate as it will help to address the research questions. Furthermore, the case study approach is considered if the research involves context, as confirmed by Creswell (2013, p.97) who stated that “The case study method explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information... and reports a case description and case themes.” The context of the current study is the Ladduga grazing reserve community. Similarly, Yin (1994) suggests that the case study can be designed in two ways: either as a single case study or as multiple case studies. In this research, single case designs were employed within the community. The rationale for using single case studies is the researcher is able to explore the case with the ability to analyze the data within the case analysis, between the case analyses and make a cross-case analysis (Gustavsen, 2008). This gives the researcher the power to look at subunits that are located within a larger case (R. Yin, 2003). The advantage of the process is that the researcher is capable of describing and understanding the context of the scene in question so well that the context can be understandable

to the reader and to produce theory in relationship to that context (Baxter & Jack, 2008; Gustavsen, 2008). Furthermore Dyer & Wilkins (1991) argue that single case studies are better than multiple cases because a single case study produce extra and better theory.

Case study research's weakness is typically described as "not being quantitative." Since it is a different paradigm from quantitative research, qualitative researchers do not expect to use counts, controls, and hypotheses to solve their problems, however, because the traditional research paradigm uses those measures, some argue that this type of inquiry is not genuine research in its traditional sense (Flick, 2014). In fact, there is no explicit intention to count or quantify the findings, so while this is a weakness, it is not one of which qualitative researchers are unaware (Leach 1990)., as a result, the application of the qualitative approach was used for this exploratory study. Furthermore, a limitation of the approach can be found in the data collection instrument where biased responses, incomplete recollection and reflexivity of interviewees are found (Tellis, 1997) through which the high level of contact with participants can create informal manipulation, Also Eisenhardt (1989, p. 9) states that there is "lack of clarity about the process of actually building theory from cases, especially regarding the central inductive process and the role of literature".

3.2.1 Justification for the Research Location

The choice of the case study area, Ladduga Kachia Grazing Reserve of Kaduna state in Nigeria, is therefore driven by the focus of the study. The presence of trypanosomiasis and malaria is a fundamental requirement for the research. Many studies have reported the incidence of trypanosomiasis and malaria in the chosen area. Uba et al. (2016) revealed that there is a prevalence of Human African Trypanosomiasis (HAT) among the residents living in the Kachia Grazing

Reserve of Kaduna state. More studies confirmed the incidence and presence of the disease in the Grazing Reserve (Ducrotoy et al., 2016b; Osue, Inabo, Yakubu, Audu, & Mamman, 2016). Also, Enwezor (2009a, 2009b) conducted a survey of bovine trypanosomiasis in Kachia Grazing Reserve in 2004. Many studies have been conducted confirming the presence of trypanosomiasis disease and malaria in the community (Anthony & Maikai, 2017; Enwezor, Authié, Bossard, Esievo, & Umoh, 2008; Enwezor, Umoh, Esievo, & Anere, 2006; Garissa, 2006; Nigeria, 2016; Nnabuife et al., 2013; Okello, 2013)

The socio-economic importance of the Kachia Grazing Reserve to the communities is another reason for choosing the location for the case study. The grazing reserve has 777 households with a total of 10,000 Fulani (Nomadic) pastoralists and more than 40,000 cattle, in addition to sheep, goats, donkeys, and poultry and covers the total area of 88,411 hectares of land as of June 2011. Between 1970 and 1980, the Nigerian government invested 120 million Naira (70 million USD) in livestock development, of which 70% of the money went to grazing research around the country (Ducrotoy et al., 2016; Enwezor, Mamman, & Igweh, 2019; Enwezor et al., 2009; Waters-Bayer & Taylor-Powell, 1986). According to the Food and Agriculture Organization (FAO), the KGR comprises existing facilities that have been provided on the reserve through the intervention of the federal government of Nigeria and other non-governmental organizations including NLDP, SMANR, NCNE, PARE, Pathfinder International, ADB, and IDF. Some of the facilities include six earthen dams, eleven boreholes, one major access road, a community health center, two veterinary clinics, a livestock service center, a livestock training center, eight nomadic primary and secondary schools, eight ECCD centers, and a milk collection center. Some basic computer use is available, including e-learning and ICT-based access to qualitative basic education for

nomads provided by the Model Nomadic Education Center (MNEC). Given those facilities, various studies have confirmed that the area still faces challenges of inadequate infrastructure facilities or maintenance of the existing ones, the inadequacy of qualified persons health centers and schools, and the prevalence of animal and human diseases caused by the tsetse fly and many more.

Another criterion for the selection of the location concerns the aspirations undertaken by the researcher to investigate rural health information-seeking and searching behavior. As far as the available scholarly literature studied, few studies have reported on community health information needs, seeking and searching behavior, in regions particularly affected with selected fly-based vector-borne diseases. An additional consideration for choosing the community is the connection the investigator has with the location selected. The researcher has a long-time relationship with the communities as a result of previous research visits made to the communities, along with other research teams in 2005/2006.

The Kachia Grazing Reserve (KGR) is located in Kaduna state in the northwest geopolitical zone of Nigeria at $10^{\circ}03'$ and $10^{\circ}13'N$ and longitudes $7^{\circ}55'$ and $80^{\circ}06'E$. (10.050000, 7.916667). Figure 1 shows a map of Nigeria showing its 36 states and its capital, Abuja.



Figure 1 Map of Nigeria.

The Kachia Grazing Reserve was established by the Kaduna State Ministry of Animal and Forest Resources in 1967 to settle nomads in one location to improve their standards of living and avoid conflict between nomads and farmers. It includes four major clustered communities. It covers 88,411 hectares of land and is divided into six blocks (segments), including settlement communities such as Wuro Nyko, Nassarawa, Wuro Fulbe, Wuro Modi, Wuro Saleh, Tilde Bayero, Mayo Borno, Mayo Jamil, Mayo Ardo, Mayo Wuse, and Ladugga. The reserve has a tropical sub-humid climate with annual rainfall of between 1000 to 1,200 mm and an average temperature of 28°C/82°F.

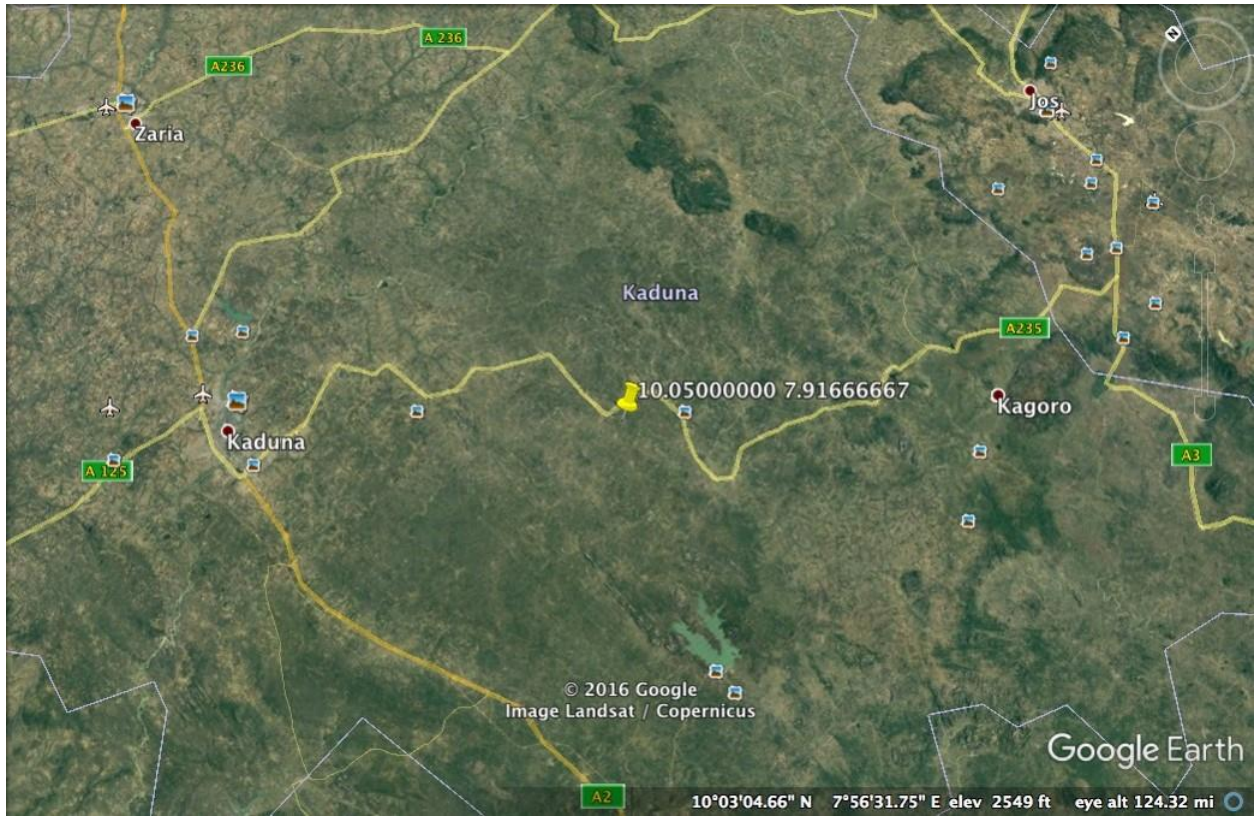


Figure 2 Aerial view of Kaduna State showing all areas, including Kachia town near the research study area.

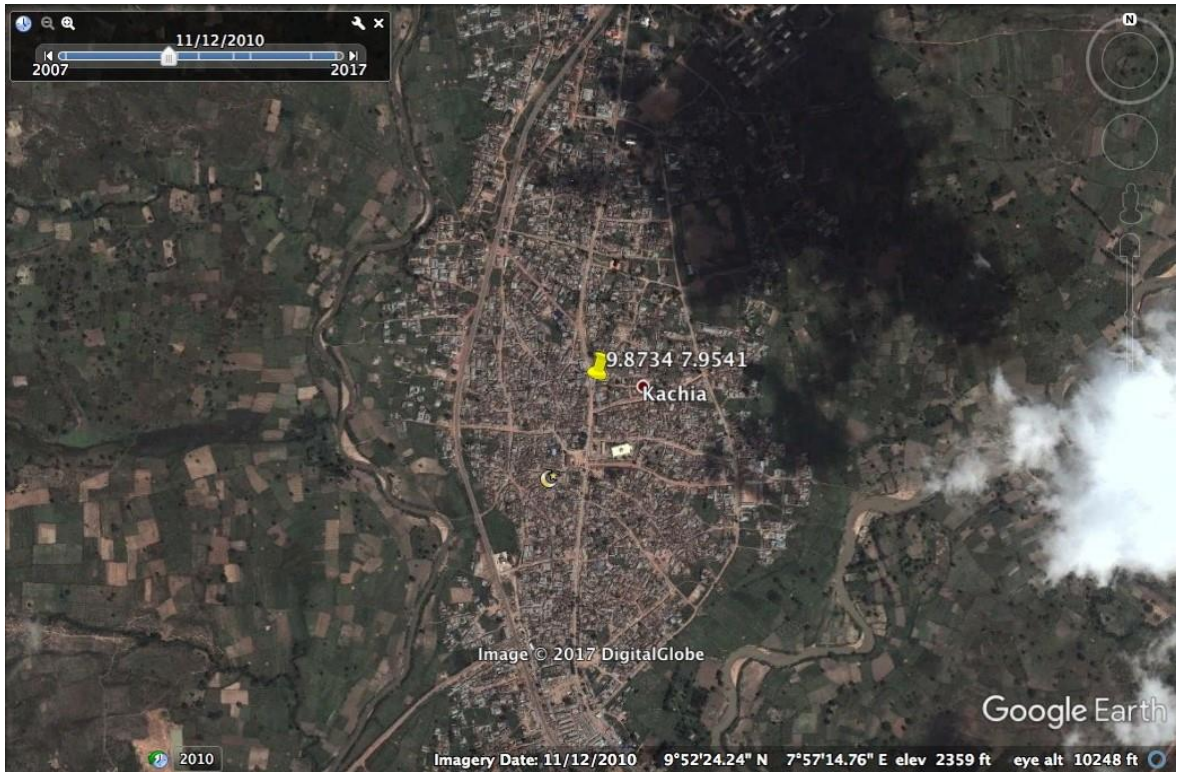


Figure 3 Aerial view of Kachia town, an economic and social area for the KGR.

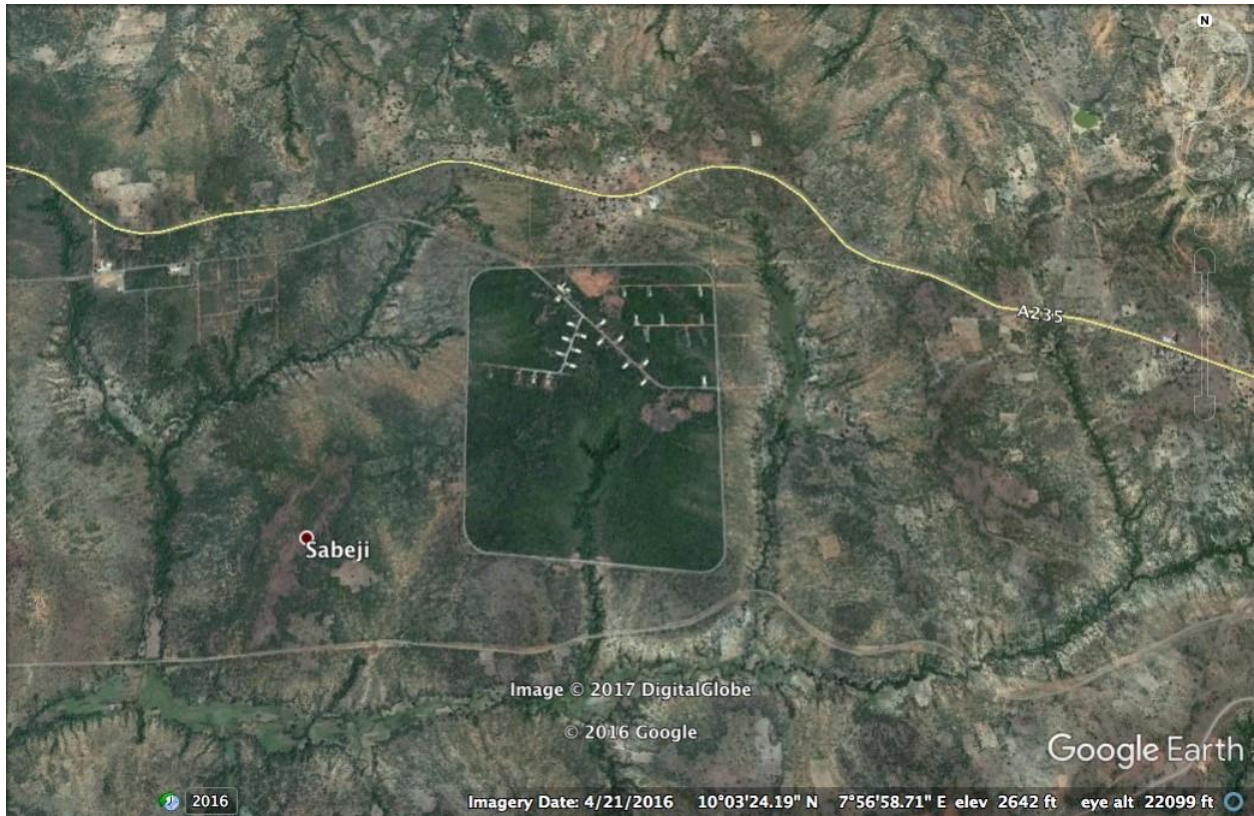


Figure 4 Aerial view of the KGR enclave.



Figure 5 Close view of KGR showing vegetation.

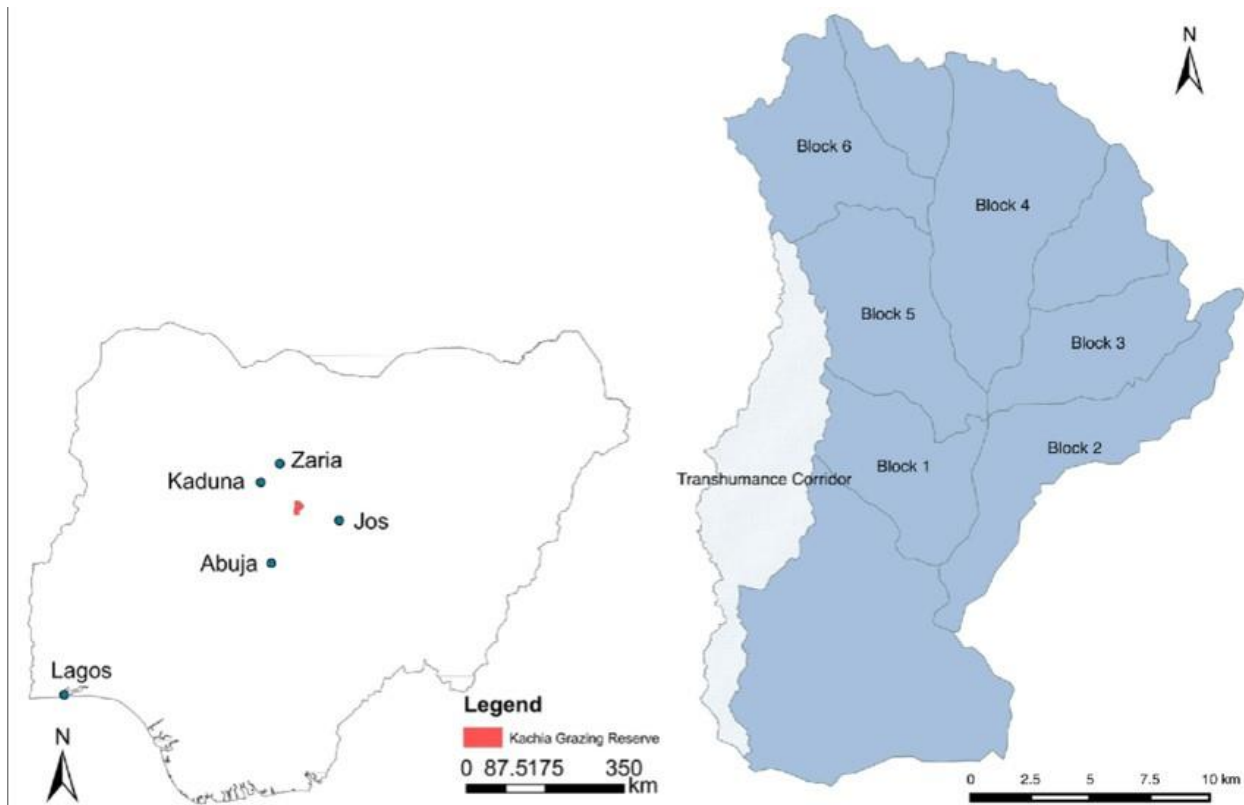


Figure 6 Map showing the six blocks of the Kachia Grazing Reserve (from Ducrottoy et al., 2016b).

According to the Food and Agriculture Organization (FOA), the KGR comprises some existing facilities that have been provided on the reserve through the intervention of the federal government of Nigeria and other non-governmental organizations including NLDP, SMANR, NCNE, PARE, Pathfinder International, ADB, and IDF. Some of the facilities include six earthen dams, eleven boreholes, one major access road, a community health center, two veterinary clinics, a livestock service center, a livestock training center, eight nomadic primary and secondary schools, eight ECCD centers, and a milk collection center. Some basic computer use is available,

including e-learning and ICT-based access to qualitative basic education for nomads provided by the Model Nomadic Education Center (MNEC).

In spite of those facilities, various studies have confirmed that the area faces challenges of inadequate infrastructure facilities or maintenance of the existing ones, inadequacy of qualified persons health centers and schools, and the prevalence of animal and human diseases caused by the tsetse fly and many more. Also, the community had a communication network that included the road linking the reserve with state highway 235. In addition, there are two mobile cellular phone carrier networks, Mobile Telecommunications Network MTN and Globacom Glo. These make it possible for the community to communicate within itself as well as the possibility of Internet service on mobile phones.

Many studies have reported the incidence of trypanosomiasis and malaria in the area. The study of Uba et al. (2016) revealed that there is a prevalence of Human African Trypanosomiasis (HAT) among the residents living in Ladduga Kachia Grazing Reserve of Kaduna state. More studies confirmed the incidence and presence of the disease in the Grazing Reserve (Ducrottoy et al., 2016b; Osue, Inabo, Yakubu, Audu, & Mamman, 2016). Also, Enwezor (2009, 2009) conducted a survey of bovine trypanosomiasis in Kachia Grazing Reserve in 2004. Many studies have been conducted confirming the presence of trypanosomiasis disease and malaria in the community (Anthony & Maikai, 2017; FN Enwezor, Authié, Bossard, Esievo, & Umoh, 2008; FN Enwezor, Umoh, Esievo, & Anere, 2006; Garissa, 2006; Nigeria, 2016; Nnabuike et al., 2013; Okello, 2013).



Figure 7 Livestock production in the KGR.



Figure 8 Education infrastructure primary education for children in the KGR.



Figure 9 Adult education, literacy, and awareness in the KGR.



Figure 10 Social infrastructures in the ICT.



Figure 11 Basic facilities including solar panel, borehole, clinics (“Brief on Ladduga Grazing Reserve, Kachia LGA Kaduna State,” n.d.) (FAO, n.d.)

3.2.2 Study Population and Sample

The 50 participants came from four clustered communities of the Ladugga Grazing Reserve, including Mayo Borno, Mayo Jamil, Mayo Ardo, and Mayo Wuse, within the six blocks located in the Grazing Reserve within the North West geopolitical zone of Nigeria.

Collecting data through multiple sources supports the triangulation of findings by facilitating validation of data through two or more sources. The purpose of triangulation is to allow room to exploit any and all available data the study is looking for, since multiple data collection instruments are used (Fenech Adami & Kiger, 2005). This process was used to test for saturation in the data collection as a measure to re-access any available information that had not been disclosed by previous subjects who participated in the survey. The study included various demographics among the participants, including a biomedical practitioner, elder statesmen, the traditional title holders called Ardos, the religious leader, the local community organization leaders, youth activists, women leaders, and underrepresented or unrecognized residents. This diverse group enriched the information gathered in the study.

Another interesting phenomenon of the research is that the communities selected showed a significant presence of the effects of the diseases in question. For the sampling of the above-mentioned participants, the researcher used a non-probabilistic sampling strategy that is commonly referred to as purposive sampling based on the contextual situation of the study. The participants in this study were selected on the basis that they could provide the best information while answering the research questions (Patton, 2005; Tashakkori & Teddlie, 2010). Neuman's definition of purposive sampling is: a valuable kind of sampling for special situations and used in exploratory research for the judgment of the selected sample population (Neuman, 2006, p. 22).

Furthermore, Teddlie, and Tashkookri (2010) highlighted the main characteristics of purposive sampling, including its focus on specific purposes related to the research questions. In addition, the researcher can choose the participants who can provide detailed and rich information related to the questions asked. Also, in that study, the researchers used their own judgment

regarding whom to choose as the right respondents, which also served as a procedure to get the best and most detailed understanding from each respondent. As a result, participants were selected based on merit, thus providing sufficient information for the study. The recruitment strategies applied the use of closed consultation with community leaders in pre-survey exercises and carried a developed plan to identify and recruit potential participants for each session. The strategies were determined by the type and amount of data to be collected in the study. Participants were at least 18 years of age. For the questionnaire participants had to be able to read Hausa in Ajami or Latin script. For the interviews and focus group discussions, participants had to be able to communicate in Hausa. Flexibility is key with purposive sampling and the researcher must be open to changes as the study unfolds but must only make changes if they are critical and with care. If a certain criterion for selection changes within the process of data collection, activities or subgroups of populations of people recruited may become irrelevant in answering the research questions and a new set of respondents chosen lengthening the process.

3.3 Data Collection Methods

Data collection methods are the techniques used to collect empirical data so as to make it easier to analyze (Johnson & Turner, 2003). These authors identified six major methods of data collection that are typically used in social and behavioral research: (1) questionnaire, (2) interview, (3) observation, (4) test, (5) focus group, and (6) secondary data (e.g., personal and official documents, physical data). Data collection is an important aspect of research design, as inappropriate data collected could invalidate the results of a study. The process of triangulation is employed; this refers to the use of more than one approach in research in order to enhance the confidence and validity of the findings. It is an attempt to map out, or explain more fully, the

richness and complexity of human behavior by studying it from more than one vantage point (Creswell & Clark, 2007; Farmer, Robinson, Elliott, & Eyles, 2006; Fenech Adami & Kiger, 2005). According to (Denzin, 2012), through the categorization of the triangulation method, the research will explore the data through several sampling strategies so that a variety of types of data will be gathered from different contexts and in different social situations.

3.3.1 The Questionnaire Survey Approach

One of the data collection techniques this researcher used for the survey is the application of an open-ended questionnaire. A survey, a method borrowed from cognitive psychology (Ericsson & Simon, 1980), is a common method employed in information research. It is estimated that over one-third of investigations regarding information behavior have been conducted through use of some form of survey method (Fisher & McKechnie, 2005). A questionnaire, one of the methods of data collection, is typically divided into two types. First, there are qualitative questionnaires that usually feature unstructured, exploratory, open-ended, and, typically, in-depth though structured questions; a quantitative questionnaire is completely structured and features closed-ended questions (Johnson & Turner, 2003). Even students conducting surveys for a student newspaper may commonly use questionnaires, but these types of instruments can be very sophisticated.

Johnson and Turner (2003) point out that a research questionnaire should possess 13 principles. The survey should feature questions that (1) match the research objectives; (2) show an understanding of the participant; (3) use familiar, clear, and precise language; (4) are not overloaded by terms; (5) avoid double-barreled questions, or questions that actually ask two questions that make it difficult for a participant to select just one answer; (6) avoid double

negatives, which can be confusing; (7) use open-ended or closed-ended questions judiciously so that a survey does not become unnecessarily tedious or repetitive; (8) avoid sufficient response categories for closed-ended questions so participants can feel as though they can select the answer that does match what they were intending to say; (9) apply multiple items to measure an abstract construct since it can be difficult to find all the answers one seeks in just one question; (10) are easy for the participant to understand; and (10) have been piloted in.

Numerous studies have been conducted related to consumer and biomedical health information applying the questionnaire data collection method. Sometimes surveys, or questionnaires, seem easy, because once the instrument is designed, it can be sent out to multitudes of people; however, getting people to actually mail surveys back can be difficult (Bergman, 2005).

Examples of studies using questionnaires include some health information studies. First, an exploratory study of information sources and the health information-seeking process used a qualitative-based questionnaire to 3,392 respondents focusing on recent searches for health information (Talosig-Garcia & Davis, 2005). Another study of help-seeking behaviors in men and women with common mental health problems surveyed 15,222 adults based in a random sample. By focusing on closed-ended responses, this quantitative study was able to generate statistical results rather than narrative-based results (Oliver, Pearson, Coe, & Gunnell, 2005).

Questionnaires can be designed to tackle large-scale research projects where investigators wish to ask many people about their experiences. For example, the Pew Internet and American Life Project in 2002 explored health-seeking behaviors and, because of the quantitative nature of the study, allowed researchers to categorize significant amounts of information (Eheman et al., 2009). They then were able to determine that adults with lower incomes had fewer opportunities

to use computers than those with higher incomes, thus highlighting the persistent digital divide between low- and high-income populations.

Bergman (2005) found, after an extensive questionnaire-based project, that individuals who engage in positive health behaviors are likely to seek out more information. Another study explored the differences between breast, prostate, and colorectal cancer patients in how they make their decisions; all patients were part of the Pennsylvania Cancer Registry (PCR) (Nagler et al., 2010). Because of the significant amount of follow-ups that were necessary, the survey seemed to require large amounts of contact with survey recipients to ensure that the questionnaires were returned.

Surveys can be used in a variety of ways. For example, a survey on health information-seeking behavior for patients in Iran revealed that patients requested health information pertaining to their medical treatment (Gavgani, 2010); this study might be compared to studies in other nations to determine why the majority of patients in the Iran study more actively sought information from their doctors, whereas in other nations they did not. One such study of primary care doctors explored 10 nations at once regarding patient follow-up, and found that the United States sometimes lagged behind other nations as a result of patients' lack of health insurance (Schoen et al., 2012).

In view of this, as discussed above, this research employed a questionnaire to answer some of the research questions. Similar types of studies have also used a questionnaire (Dutta-Bergman, 2005; Gavgani, 2010; Nagler et al., 2010; Oliver, Pearson, Coe, & Gunnell, 2005; Talosig-Garcia & Davis, 2005). Also, a questionnaire provides a relatively efficient method for soliciting information, especially in the communities where there are people who may not have enough time

to attend interview or focus group sessions. The written form of the questionnaire made it possible to develop a data collection instrument in the local language using the Ajami script. Another reason for choosing the questionnaire as a data collection tool was that participants were free to express their responses without the researcher being present.

3.3.2 Interview Data Collection

The second approach applied in the study is the use of interviews. As previously discussed, the questionnaire approach only views large-sample participant views, attitudes, and behaviors, while the interview approach explores some basic concepts of data collection that the questionnaire had not addressed, including having access to direct verbal questioning of participants by the researcher. This technique help to obtain personal aspects of participant behavior and help to collect detailed qualitative data about ambiguous and sensitive issues (Harris & Brown, 2010). According to Saunders (2011), interview is a method in which a researcher can obtain detailed data that can be immediately analyzed. Interviews produce comprehensive data, particularly face-to-face interviews where the researcher can control the flow of the primary data collection process and can cover the project issues in an in-depth manner (Saunders, 2011).

Furthermore, interviews with participants can be viewed as a method to create reality construction (Holstein & Gubrium, 1995). In-depth interviews are a special form of interview that are more intense and involve fewer subjects but in greater detail (Boyce & Neale, 2006). There are typically three types of research interviews: the structured, which involves advance preparation of all of the questions the researcher intends to ask and is more of a verbal kind of survey; the semi-structured, an interview in which the researcher plans some questions but allows the interview subject to direct the conversation more and will change the questions based on the interviewee's

responses; and the unstructured interview, which allows the interviewee to move the conversation with little or no guidance from the researcher (Britten, 2007; Gill, Stewart, Treasure, & Chadwick, 2008; May, 1991).

Unstructured interviews can last for hours, which is why researchers might be more apt to select a semi-structured interview, which allows a mix of flexibility and consciousness of time; this is why health researchers more frequently opt for the semi-structured interview (Britten, 2007; Gill et al., 2008; May, 1991). Interviews, like focus groups, which are effectively a “group interview,” are regarded to be the most important tool used for collection of data in qualitative health research. For example, a study of cancer patients’ information needs and information-seeking behavior used the in-depth interview approach and was able to find that patients’ cognitive understanding is often influenced by personal factors of faith, hope, and charity (Leydon et al., 2000). A similar study mixed interview and survey methods with cancer patients (Eheman et al., 2009). In-depth interviews can provide the rich types of data necessary for performing a phenomenological study, which is a type of study common to nursing programs that explores why a particular phenomenon occurs (Flick, 2014).

One such phenomenological study explored the experience of an enhanced recovery program for gynecological cancer patients using audio-recorded face-to-face or telephone interviews (Archer, Montague, & Bali, 2014). Another study used a semi-structured interview of caregivers and patients who indicated some dissatisfaction with care rehabilitation, but because the researchers used a survey and interview and did not integrate them together well, and the results seemed problematic (O’Cathain et al., 2007). A more successful combination used semi-structured interview and some published documents together to develop case study research in the area of

managing changes in cultural practice to investigate how primary health care managers attempt to bridge gaps in culturally diverse groups (Marshall, Mannion, Nelson, & Davies, 2003). Combining focus groups, usability tests, and in-depth interviews to determine how users search for health information was another group of techniques that seemed to work well (Eysenbach, 2008). Finally, a Canadian study explored health-seeking information using an interview alone, coded with NVivo 12 software, and seemed to successfully use the technique to determine various contributions to information-seeking (Wathen & Harris, 2005).

The limitation of interviews, particularly the unstructured interview method, is that they require a lot of time to collect the needed information in the study because the researcher needs to know something about the setting in which the interview will take place and to set it up properly, as well as gauging the appropriate way to ask questions such that the interviewee and interviewer will be comfortable with each other. In particular, unstructured interviews can cause problems because there is not a pre-planned script to at least begin the conversation (Arksey & Knight, 1999). The interview for this study was designed in an open-ended format in which there would be some flexibility in the discussion, and the general theme of the questions would be asked while setting the stage for the discussion. Building and designing the interview were done with cognizance and careful consideration of theories and models of general and health information needs and seeking and searching behavior to help in arriving at the key themes that were used as the questions.

The use of semi-structured interviews permits an in-depth discussion and interaction with the respondents. Participants are able to freely answer open-ended questions in a private setting. Furthermore, the use of interview sessions conformed with cultural attitudes of the participants as

being more verbally responsive than a questionnaire, which may not be familiar to the participants. Interviews allowed for more detailed responses than could be collected through a questionnaire alone. Above all, interview and focus group approaches are regarded to be the most important tools used for the collection of data in qualitative health research similar to the current study (Dee & Blazek, 1993; Leininger, 1985; Padgett, 2016; Wathen & Roma, 2005).

3.3.3 Focus Group Discussions

Finally, another important qualitative technique the study used is the Focus Group Discussion (FGD). Focus groups are widely used in various studies by researchers to explore a range of phenomena (Brajtman, 2005). They are qualitative interactions in a group interview or discussions aimed at capturing participant opinions on research topics (Morgan, 1998). Focus groups explore the degree of agreement in the discussion in which participants engage (Gibbs, 1997). The main purpose of focus groups is to identify the participants' attitudes, feelings, beliefs, experiences, and reactions that sometimes cannot be adequately measured in an interview or observation (Leontowitsch, 2012). Numerous studies have been conducted related to consumer and biomedical health information using focus groups.

One study used a focus group-style interview using children and adolescents; it found that using the focus group interview made it easier to get data from young people regarding health concerns (Heary & Hennessy, 2002). For adults, focus groups can also be useful. One study used a focus group to determine the kind of information cancer patients want (Rozmovits & Ziebland, 2004). Focus groups can lend themselves to being combined with grounded theory, as one study used to explore prostate, colorectal and breast cancer. The study offered individual interviews to participants who could not make time for a focus group; it found that the interviews resulted in

different types of information than the focus groups (Lambert & Loiselle, 2007). The researchers found that the focus group actually helped them to create better interview questions for the individual patients to go more in depth than they might have had they simply used the focus groups or interviews alone (Lambert & Loiselle, 2007).

Another successful mixed use of the focus group and interview studied how users find health information on the Internet (Eysenbach & Köhler, 2002). Finally, a study applied the use of focus groups to determine how adolescents use technology for health information seeking; this particular study used significant controls in place, including careful recording of the demographic data of participants, the use of tape recording, and significant cross-checks on the coding (Skinner, Biscope, Poland, & Goldberg, 2003).

Combining a case study with interviews worked well in a study that explored patients' knowledge, attitudes, behaviors, and health care experiences in the prevention, detection, management, and control of hypertension in Colombia (Legido-Quigley et al., 2015). The study applied two sampling methods: a purposive sample, in which participants were selected on the basis of their demographic and socioeconomic characteristics, and a random sample, which used the database records of the main hospital in two areas (Legido-Quigley et al., 2015). Participants were invited to an interview, and from there were asked, using the snowball approach, whether they knew others who might like to participate (Legido-Quigley et al., 2015). The final study involved a combination of semi-structured interviews and focus group discussions to explore how the patients found out about their hypertension, what they knew about it, and how they responded to learning about their condition, as well as how the health system had responded to their need for information (Legido-Quigley et al., 2015).

By combining multiple types of data to explore how two regions of Colombia were dealing with their diagnoses, the resulting data were richer than had the study relied on interview or focus group alone. In this dissertation, building and designing the focus group discussion format will be done with cognizance and in careful consideration of theories and models of general and health information needs as well as seeking and searching behavior in order to help arrive at the key themes that will be used for the questions.

The use of focus group discussion as form of data collection method was adopted because the communities studied traditionally use a similar approach to discuss their concerns. For this reason, the application of a focus group approach is something the community will be familiar with, which facilitates the collection of relevant information from participants. Similarly, the focus group approach helps to bring people together in one place to discuss the questions investigated. The focus group addressed areas that the questionnaire or interview had not touched. Another reason of choosing the method is that it provides in-depth information in an informal setting by encouraging participants to express their views freely. Further, the choice brings about an informal supportive group where members share their views for discussion. By and large, the researcher chose a focus group approach because it also allowed groups to identify areas of consensus and made it possible for participants to reflect on other participants' comments that they might not have considered.

3.3.4 Procedure Followed for Questionnaire, Interview, and Focus Group Data Collection

The procedure for this research was categorized into five stages, or phases. Phase I: In Phase I, the research established the conceptual basis of the research direction, which included

building the introduction, literature review, and research questions. Phase I further identified and connected the studies with relevant literature to support the phenomena of the study.

Phase II involved the collection of initial data. It began with a two-day pilot study of the community selected in the Ladugga Grazing Reserve; it involved pre-surveying the communities selected to become familiar with them before conducting the actual work. This stage was very important, as it helped to identify logistical and other problems that could possibly arise before the real study. Also, this stage helped in recruiting the participants by using a purposive sampling method, as discussed in the previous section. Furthermore, this stage also helped in re-addressing issues and problems the research might encounter during the main visit to improve the effectiveness of the study.

Phase III was the actual data collection; this involved traveling to the communities selected for the data collection using the data collection instruments of questionnaire, interview, and focus group.

Phase IV entailed the analysis of the data collected by applying the qualitative approaches, as explained in detail in the next chapter of data analyses.

Phase V involved the interpretation of the data, written results of the study, and grounded theory-building of a model that summarizes the findings.

During Phase II of the study, the researcher conducted a familiarization visit to the Kachia Grazing Research location prior to the proper data collection period. The short visit identified the communities, recruited participants, and discussed the research issues with local contact persons. During the visit, a short training was conducted for participants related to the issues associated

with the objectives of the research. This included the explanation of how the participants would respond to the questionnaire or interview or participate in focus group discussions.

The questionnaire was designed in two languages, Hausa and Fulfulde, from its original English language draft. Hausa and Fulfulde are among the languages spoken by the communities the research examined. The questionnaire had been translated and written in the normal Arabic alphabet called Ajami. Ajami writing script (Figure 12) is rooted in the Arabic alphabet and is used for writing some African languages, especially those of Hausa, Fulfulde, and Swahili because of the long Islamic tradition of the Arabic language attached to these societies (Ngom, 2017; Souag, 2010; Warren-Rothlin, 2012). Providing the questionnaire in multiple local languages made it more convenient for participants to answer the questions effectively without much translation interference.

تَمْبَايُوي دَنْغَنِي دَ قُدُنْ - ظَنُدُو

Tambayoyi dangane da kudan tsando

Question related to tsetse fly

مَي كَا/كِي سَانِي غَمِي دَ قُدُنْ - ظَنُدُو؟

Me ka/ki sani game da kudan tsando

What did you know about tsetse fly

شِنْ كَا/كِي تَبَا سَامُنْ بَيَانِي دَنْ غَنِي دَ ثُوتَرِ دَ ثِيْرُنْ قُدُنْ ظَنُدُو يَكِي هَيْفَرُوَا؟ اِدُنْ
ءَاءَ نِي، طَلَّكِي تَمْبِيُويْنِ دَكِي تَفِي لَكِ ثَغَبَ دَ اَمْسَ تَمْبِيَا تَ غُومَ شَا بِيْرُ.

Shin ka ko kin taba samun bayani dangane da tsutar da
kudan tsando yakan haifar?

Idan a'a ne, tsallake tambayoyin da ke tafe ka cigaba da
amsa tambaya ta goma sha biyar.

Do you know any information about the diseases the
tsetse fly causes? If you do not know, proceed to question
fifteen.

Figure 12 Example of Ajami Script writing in the Hausa language and English translation.

The questionnaire covered all the issues that are reflected in the research questions of the study of health information needs and seeking and searching behavior of the communities affected with vector-borne fly diseases in Nigeria. The exact content was translated from the original form designed in English and was made as easy and simple as possible for the participants to understand, as suggested by Bergman (2005). The expected time for participants to answer the questions was within the range of 10 to 15 minutes. In developing the questions, the researcher used open-ended

questions with possible optional multiple-choice answers, allowing the respondents to select one or more options as needed.

The questions were asked in a sequential flow to allow the respondents to stream with the storyline. The Likert scale approach option was used for a few of the closed-ended questions to allow room for optional responses of participants using a five-point scale. The written questions were legible and clear in Times New Roman point size 14 to accommodate visually impaired readers for easy and quick responses. The identities of questionnaire respondents were kept confidential by assigning a number to each survey. This process helped protect the identity of participants by strictly abiding by ethical research guidelines; specifically, numbers associated with respondent identities were stored separately from the questionnaires.

The building and designing of the questionnaire was done with cognizance and careful consideration of theories and models of general and health information needs and seeking and searching behavior to help in arriving at the key themes that would be used in the study. The researcher administered the questionnaire after a brief, formal introduction stating the objective of the study and the confidentiality of the participant information. The questionnaire was then handed to participants for completion.

For the interviews, the forum for conducting the interviews varied depending on the location of the community person's availability. It also varied depending on the suitability of the respondent; some of the participants were approached in their home, clinic, prayer place, shop, market, or farm. The researcher took sole responsibility for conducting the interview sessions.

Two audio recording devices were used simultaneously to record the conversations, a small USB recording device and the researcher's personal mobile phone (iPhone 6). Using the two

devices guaranteed the appropriate recording had been made so as to avoid technical failures in using one device and in case other device failed to record, as it might be difficult for the respondents to repeat their interviews. Two locally educated residents were hired during the pre-survey visit to assist in jotting down the important points of responses to complement the electronic devices.

The transcripts of the interviews and audio records were immediately kept safe and transferred to the researcher's personal, password-protected MacBook laptop computer. The procedure for transferring the information recorded was performed as soon as the session was finished to reduce the risk of losing the recording device.

The focus group discussion used a random selection method based on the participants even though, as Shamdasni (2014) argues, focus group participants do not constitute a random sample; nonetheless, they should reflect the population of interest. The number of participants consisted of a mixture of respondents who participated earlier in the questionnaire or the interview. Three categories of participants—elders (male), females, and youth (male)—were recruited. This approach was used as to enable effective and efficient data to be collected.

Traditionally rural communities in Africa are influenced by different factors in the freedom of expression or speech. Therefore, combining women and youth or elders in one or more focus group discussions would result in one group or another dominating or being silenced during the discussion, which would infringe on the objective of the study. Thus, it made sense to have three separate focus groups: elder males, adult females, and younger adult males. For most of the time, the researcher used the presence and assistance of a local contact person to help engage participants in the discussion process and to secure a private place for discussion.

In addition, the researcher acted as a moderator and attempted to make participants feel comfortable about being truthful and candid in their responses while also guiding the discussion so that it stayed on track (Greenbaum, 1998). The researcher allowed room for the flexibility of responses from participants if that seemed beneficial. Examples included probing into deeper issues, skipping some topics that might already have been discussed, or allowing new topics to emerge from the discussions (Vaughn, Schumm, & Sinagub, 1996).

Focus groups are designed and executed for the purpose of refining items from the issues discussed and generating additional ideas that emerge from the discussion (Rubin & Rubin, 1995, 2011). Prior to conducting the discussion, the meeting place, the meeting time, and how long the discussion would last were communicated to group members and participants (Krueger, 1988). For this reason, the researcher made sure the meeting venues complied with some of the traditional meeting norms of the communities. However, the female discussion was conducted in a secluded, big room without the presence of any male residents, even though they were outside, to provide the women the autonomy to express their feelings. The elder group was interviewed at the main office of the Ardo (the village chief), and the youth focus group discussion was conducted on a farm under a shade tree.

In keeping with ethical guidelines as Rubin and Rubin, (1995) stated, the researcher began the group discussion with information on the ethical regulations, and he obtained informed consent from participants for their participation in the research, as well as for audiotaping. The participants were encouraged to freely share their thoughts and ideas to make the discussion more productive. Furthermore, the researcher stated that their responses would not have any negative consequence on their volunteering to participate. Some basic documents and other materials were readily

available during the discussion, which included for each participant (where applicable) the consent form, a copy of the research, evaluation sheet, pad and pencil, recording device (iPhone, audio recorder), permanent marking tape, notebooks, and refreshments.

The focus groups were comprised of three groups: five male elders, five male youth, and six female participants. The separation of the sessions was intentional so as to enable the researcher to access as much information as possible and also comply with Fulani tribe culture. The number of participants also fell within the range of the required number of participants expected to attend focus group discussion as was suggested by scholars. The duration of the discussion times were: 56 minutes (elders' group), 52 minutes (youth group), and one hour and 10 minutes (female group). The researcher attempted to ensure that the group discussion was not a debate, a conflict resolution session, a problem-solving session, a promotional opportunity, an educational session, or intervention therapy.

Furthermore, the religious and traditional considerations of the gender and age groups of participants attending the meeting were respected. In many environments in Western cultures, mixing genders for both men and women is acceptable; however, in the study's environment, the focus group session addressed the religious and traditional custom of men's and women's separateness. Another consideration was that a community elder or a religious leader (Imam for Muslims or an Ardo) was consulted with utmost respect because they helped the researcher achieve the aim of the study and facilitated freedom of expression by participants during the discussion.

3.3.5 Cultural Considerations for the Data Collection Tools

The data collections methods and tools the study employed—questionnaire, interview, and focus group discussion—are considered Western approaches and have many negative connotations

for some Africans, particularly in Nigeria, where the research took place (Ajayi, 1980; Orellana & Bowman, 2003; Peña, 2007; Van de Vijver & Leung, 1997). For this reason, the researcher had to comply, follow, and accept the ethical and cultural dimensions of the rural communities. Traditionally the data collection instrument used are not wholly suitable or matched to African religious or cultural approaches for obtaining information in research, especially in the Ladugga Grazing Reserve, the site of the study. This can be problematic, which might be the main reason appropriate, relevant information is often not acquired from the participants when it entails studies in Africa.

For example, the style of participant recruitment in rural Nigerian communities to a fill out a questionnaire, conduct a recorded interview with an electronic device while jotting notes on paper, or bringing participants together in one place as a focus group is not a normal practice in Africa. Sometimes it is difficult for African participants to answer or give relevant information if they find that in the process of the interview, the researcher is recording their speech, or taking notes about what was said.

In addition, it considered odd to bring people together in a place to ask them to discuss issues about the research, as the focus group discussions entailed, nor is it normal to give village participants a sheet of paper with questions on it and expect them to respond, when in the past they had not been exposed to such a practice. Thus, the researcher devised and utilized different approaches to suit the communities' ways of life, interaction systems, and other traditional forms of exchanging information without deviating from IRB ethical norms. These issues included a discussion of research issues in a different venue according to what was suitable for the

participants. Furthermore, the discussion with participants occurred in different locations such as at religious premises, farms, market stalls, farms, etc., as described above.

The study offered small monetary incentive to some of the communities as appreciation even though it is not a common practice for the rural community to participate for money. In Africa and Nigeria, especially the rural area where the study was conducted, most people do not accept a monetary or food gift from a strange person who visits their locality to conduct research, but they may be more comfortable in taking something beneficial to their livelihood, such as groceries, clothing, or medicines for humans or animals. Some of the community members agreed and accepted the monetary incentive as result of long-time recognition and relationship the researcher has had with the community. Another cultural consideration that could have impacted the study is a misperception about the researcher's institutional affiliation. The University of Wisconsin-Milwaukee is in the United States; this may be negatively misinterpreted that the purpose and objective of the study was attached to Western imperializing. As a result, the researcher recalled the historical relationship he had with the community through his previous employment and mentioned his past affiliation with a Nigerian university and his local ties to mitigate the potential chilling effect of a Western university name.

3.3.6 Ethical Considerations

Institutional Review Board approval was obtained before the survey began. The approval was given on by University of Wisconsin-Milwaukee IRB office in December 2017 (IRB 18.098-UWM). Informed consent is recognized as a central component of ethical research; ideally it describes the process in which an individual or his or her parent or guardian agrees voluntarily to join in a study after the purposive risks and benefits have been discussed and understood. The

process of getting approval for this study was in compliance with norms for international research that involves the use of human subjects. Being in compliance minimizes the risks and maximizes the potential benefit for the human subjects involved in the study.

3.4 Data Analysis

LeCompte and Schensul (1999) defined data analysis as the process by which a researcher reduces data to a story and its interpretation. Analyzing data involves the examination of several ways of revealing the relationship of patterns and trends found while conducting a study. This process reduces the amount of data to a manageable size so that it can be analyzed easily at the end of an investigation (Miles & Huberman, 1994). Qualitative approaches involve examining research data in a non-numerical way. Also, Babbie (2004) stated it is another approach that focuses on interpreting observations to find the essential meaning and pattern of relationships.

In qualitative data analysis, the data remain in the narrative form because the specific details are what are important. In qualitative data analysis, the emphasis is on the interpretation and classification of linguistics (or visual) material so that meaning can be made not through numbers but through words (Flick, 2014). Flick further stated that qualitative data analysis, in most cases, involves a degree of ambiguity, where the researcher must read “between the lines” of what is reported. As in quantitative research, however, in qualitative research, sometimes narrative data has to be reduced to a variable that can be correlated with other variables in the study.

Furthermore, qualitative approaches facilitate a process by which quantitative data are transformed into qualitative data, such as by highlighting sections of a lengthy interview in green ink. This is because green refers to a code called “research task,” and the researcher wants to be able to call up all times when respondents discussed a “research task” to look for patterns. This

approach, often called coding, can be used to extract more information from quantitative data or to confirm an interpretation of it (Flick, 2014). Therefore, the main purpose of qualitative analysis is to describe phenomena in research and look for explanations for the differences in those phenomena by building or developing a theory based on the phenomena (Lopatovska & Smiley, 2013; Tashakkori & Teddlie, 1998). The analysis of qualitative research involves aiming to uncover or understand the big picture by using the data to describe a phenomenon and what it means. Hoepfl (1997) stresses that qualitative methods are a powerful tool for enhancing our understanding of phenomena in the context of a specific setting.

Bogdan and Biklen (1997) define qualitative data analysis as “working with data, organizing it, breaking it into manageable unit synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others.” Qualitative study tends to use inductive analyses of data, which means that some generalizations emerge out of the data (Johnson, 2007; Hoepfl 1997; Mertler 2006). Since part of the data of the current study deals with a qualitative understanding of the in-depth perception of health information-seeking behavior among rural community residents, the process of Grounded Theory (GT) analysis will be applied using the qualitative approach of coding techniques with the aid of the qualitative coding software NVivo 12.

Qualitative Data Analysis Software (QDAS) is a type of software created to help researchers interpret unstructured or semi-structured data for a variety of reasons, including pattern analysis, theory testing, theory building, and study evaluation (Bazeley & Jackson, 2013). In addition, Patton (Patton, 2005) points out that it is easier to store, code, retrieve, and compare data using software rather than working with data by hand. Examples of QDAS software include Atlas,

NVivo, and MAXQDA. While hand coding interviews is possible, it is time consuming, and it is easy for researchers to miss something important.

For example, Wathen and Harris (2005) used NVivo to help organize both the interview scripts and responses for their study that took place in a rural part of Ontario, Canada, to examine health information-seeking experiences. The study revealed that formal, informal, and information intermediaries contributed to the information-seeking behavior of rural women (Wathen & Harris, 2005). Finding the patterns in all of the text would have been quite difficult without NVivo's assistance. QDAS can also help to sort and search for multiple variables much more easily than hand coding of data. For example, researchers used NVivo to help them analyze their surveys and interviews to determine patients' knowledge, attitudes, behaviors, and health care experiences on the prevention, detection, management, and control of hypertension in Colombia. The researchers were able to present five main themes, which arguably was much easier with NVivo's help in analyzing all of the data (Legido-Quigley et al., 2015).

3.4.1 Data Analysis Procedure: Transcription

The audio data collected during the interviews and focus group discussions were transcribed using Dragon dictation software. The process involved the conversion of translated audio from the Hausa language by the researcher to English. This was done simultaneously as the researcher listened to the audio files and dictated the translated part in English using the Dragon software. The software greatly simplified the task of transcribing the audio files and reduced the possibility that some information might be missed or omitted. Furthermore, the researcher re-authenticated the transcripts as converted by the Dragon dictation software with the application of Text2Speech software. This is another application that reads text content that has already been

processed by Dragon software. The Text2Speech software made it possible to listen to the converted scripts in an audio format. This was especially helpful in detecting any errors as the result of pronunciation differences when interacting with the Dragon software. The software can help overcome language barriers, especially for people who are non-native speakers of English. The transcriptions were arranged and edited in Microsoft Word format, which was later rearranged to suit the style specifications for uploading into NVivo software.

3.4.2 Grounded Theory Data Analysis

As discussed earlier, this study applies the grounded theory (GT) approach with the aid of NVivo 12 software for analysis. Grounded theory is an inductive form of qualitative research that was introduced by Glaser and Strauss in 1967 as an approach in which the theory is developed from the data rather than the other way around. The data collection and analysis are deliberately combined, and the analysis is used to shape continuing data collection (Charmaz, 2006). The grounded theory approach involves the integration of data collection and data analysis to achieve “constant comparison” (Creswell & Garrett, 2008). Choosing the used of GT approach enabled the researcher to develop a theory that offers an explanation about the main concern of the research problem and how was resolved. GT is the discovery of emerging patterns in data and the generation of theories from the data collection for possible solution (Walsh et al., 2015; Wolfswinkel, Furtmueller, & Wilderom, 2013).

Strauss and Corbin (1990) further developed three systematic analytical steps of coding. Open coding is a process of breaking down, examining, comparing, conceptualizing, and categorizing data (p. 61). Axial coding involves “a set of procedures whereby data are put back together in new ways after open coding by making connections between categories” (p. 96).

Selective coding is “the process of selecting the core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development” (p. 116). Coding is the central concept of the grounded theory approach that is used to effectively analyze data.

3.4.3 Open Coding

Grounded theory data analysis involves the rigorous process of open coding, axial coding, and selective coding (Creswell, 2013). This study was able to utilize the grounded theory process of “constant comparison,” which aided in confirming or disconfirming emergent hypotheses and assertions. The first stage of the analysis was open coding, where the research was concerned with identifying, naming, categorizing, and describing phenomena found in the transcription text. Essentially this study thoroughly examined each line, sentence, paragraph, etc., of each transcript; each was read and reread repeatedly in search of the answer to the questions, "What is this about? What is being referenced here?"

Furthermore, the study compared the data for search similarities using common properties to group them under the same concept. The code was created by the researcher, and the processes were easily achieved with the aid of NVivo application analysis software. This enabled the categories that were derived from the concept to be grouped around related themes (Brown, Stevens, Troiano, & Schneider, 2002).

After identifying some categories through reading data, the researcher developed a coding scheme that was used to group data (Mertler, 2008); he then read the data again, and coded them carefully. The process coding of data was not based on assumptions or pre-conceptions but strictly on what arose from the responses from the interviews or focus group. This is a great advantage

when building theory, meaning the researcher allows the data collected from the respondents to define where and what categories of node (theme) containers should be grouped. This has been justified, as reported by Foss and Waters (2003), where the researcher should code data as a complete novice, someone with no extra knowledge, assumptions, or values besides what is in the data so that the research makes sense to others. Also, a code scheme should identify data according to the speaker and the context it describes (Hoepfl, 1997).

The NVivo software helped to examine all the data and classify the text that was read carefully into node containers. The goal of this process was to gain introductory knowledge about the participants, which was then used to inform the questions posed during the in-person interviews. “Open coding is the interpretive process by which data are broken down analytically,” the analytic process through which concepts are identified and their properties and dimensions are discovered in data (Strauss & Corbin, 1990 p423).

Coding is the process that permits data to be segregated, grouped, regrouped, and re-linked. The first step of the analysis starts with the process of reading and re-reading the transcribed data and writing it down in the emerging categories in the form of a paraphrase, phrase, heading, or label, and putting tags against pieces of data describing what the respondents tried to say and what the researcher thought was important (Foss & Waters, 2003; Mertler, 2008). The process was simplified as the result of the application of tools provided in NVivo application analysis software. The process further included the application of memo writing during the data collection. This included the ideas and thoughts observed while collecting data to help to develop the properties and categories of the study.

Below are examples of participants’ responses which describe the categories related to the question asked.

Table 2 Coding Scheme: Example of Main Categories

RQ 1 What are the health information needs of rural residents in the Kachia Grazing Reserve, Nigeria?

Examples of (Needs) Categories	Definition	Example of Participants' Quotes
Tsetse Fly Diseases	Participants' specific information needs regarding diseases caused by the tsetse fly that affect Humans and Animals e.g., Trypanosomiasis.	<i>"I need information about the tsetse fly because they are so many, and they bite humans and animals in which they cause disease. we called them SAMMORE and it causes sleeping sickness." (Awole).</i>
Mosquito Diseases	Participants' specific information need regarding the mosquito causing the disease malaria.	<i>"I want to know information related to the immediate sign of the fever whether my family or I am infected with malaria." (Homly).</i>
Other Sickness/Diseases	Participants' specific information need regarding the sickness and diseases other than tsetse fly and mosquito	<i>"The cases of kidney problems for both human and animal. We also confirm cases of ulcers, diabetes, high blood pressure. We have fewer cases of paralyses. I need more information about those sicknesses." (Soven)</i>
Treatment & Prevention	Participants' specific information need regarding treatment and prevention of the sickness and diseases	<i>"I want information on how to protect myself and my family. We usually use medicine in the form of an ointment and apply (repellant) it to the lower part of the livestock to reduce the excessive bite of the flies." (Seen)</i> <i>"We rely on the use of medical personnel and</i>

		<i>hospitals in finding the cure and treatment?” (Qulock)</i>
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RQ 2 (a) What factors influence, or trigger, rural residents’ health information needs in the Kachia Grazing Reserve, Nigeria?

(b) How do these factors impact the ways rural residents seek and search for health information?

Examples of (Factors) Categories	Definition	Example of Participants’ Quotes
Specific Health Issue	Participants’ state of health or sickness of a person or caregiver triggered to engage in information seeking	<p><i>“The main reason for health information-seeking is to protect me from all this disease.” (Awole).</i></p> <p><i>What motivated me to look for health information? Because I personally felt sick” (Edowel).</i></p>
Uncertain Disease	Unidentified different type of disease and sickness the participants’ participants’ lives with	<i>“I’ve lived in this community for almost 20 years. I have seen different kinds of sickness in people and we don’t know what it is.” (Clowel)</i>
Personal Well - Being	Participants’ health educational awareness regarding to sickness and disease	<p><i>“I need information related to how to protect my household from the effects of malaria disease.” (Coop)</i></p> <p><i>“The main reason for health information-seeking is to protect me from all this disease.” (Awole)</i></p>
Lack of Social Health Infrastructure	Participants’ lack of health infrastructure to support and address their health problem	<i>“Lack of access to electricity, good roads, and hospitals are a great problem. Having these</i>

		<p><i>will really help us to alleviate our problems with our health information-seeking processes.” (Looly)</i></p> <p><i>“There are no available government health facilities that will help ease this problem.” (Qulock)</i></p>
Prevention	Participants’ zeal to safeguard themselves from health problem	<p><i>“I need so much information related to mosquitos because I need to protect myself from the harmful effect they cause.” (Wole)</i></p>
Keep updated with Recent Happenings	Participant’s curiosity to know more about health information	<p><i>“We need information on various sicknesses we have. There is a lot of death of young children aged 1-5 and miscarriages.” (Tide)</i></p>
Emerging Diseases	Presence of various type of disease and sickness in the communities	<p><i>“We have a record high rate of infection among all girls and women. I am positive if all of us here in the discussion are tested, it will prove we will have the disease.” (Seen)</i></p> <p><i>“[there are] cases of kidney [disease], hepatitis, asthma. Almost every person has asthma in this community.” (Muntade)</i></p>
Quality of Life	Participant quest of good and health living condition	<p><i>“I look for information related to how the flies look. How I can protect myself if I don’t know how it starts? I need this information.” (Cusy)</i></p> <p><i>“I look for health information because I consider my wellbeing to be an asset toward</i></p>

		<i>my daily activities and the productivity of my life.” (Turone)</i>
Causes of Death	The rate of death among the community member as result of sickness and diseases	<i>“As result of this (disease) we have a record of about 20 deaths this year among our children.” (Lora)</i>

RQ 3 (a) What are the health-seeking and -searching behaviors of rural residents of the Kachia Grazing Reserve, Nigeria, who are affected by vector-borne diseases (transmitted by mosquitos and tsetse flies)?

Examples of (Seeking & Searching Behavior) Categories	Definition	Example of Participants' Quotes
Traditional Techniques	Participants' application of traditional method in health information-seeking	<i>“We rely on trials. We tried different kinds of traditional medicines. We try different herbs according to the recommendation and advice given by the traditional medicine sellers. We don't have options sometimes. We may be lucky or the other way around.” (Osleb).</i> <i>“We have various options for modern medicine that can cure us and our animals. We depend so much on modern medicine from the hospital even though we don't have it all the time.” (Quizol).</i>
Modern Approach.	Participants' application and use of modern approach in information seeking.	<i>“We have various options for modern medicine that can cure us and our animals. We depend so much on modern medicine from the hospital even though we</i>

		<i>don't have it all the time.” (Quizol)</i>
Mobile Technology Approach	Participants used and rely on mobile phone for their health information needs.	<i>“We climbed to the top of the water tank to look for good reception for our mobile phone internet signal. The GLO (Local Nigerian mobile service provider) network has stronger reception.” (Soni)</i>
Interpersonal Communication	How the participants ‘communicate by sharing ideas and question about their health concern	<i>“We get information through two ways, one through our community interpersonal communication and frequent consultation of resident in their house through the area representative to know about the health problem of the people and animal” (Fule)</i>
Observation	Participant’s practical experience regarding the treatment of sickness or diseases	<i>“The only immediate solution we have is based on practical observation. If we realized one of our animals has a problem or is slow in eating the grass or we observe something weird, we rush to give them medicine related to either the eating of plastic bags or issue with their kidneys, we administer drugs or make an injection. We are forced to be self-medical personnel by trial and error. We were able to know the kind of drugs they need and what injections they required.” (Pusoleb)</i>
Self-Help Seeking	Strategies the participants’ employ in health information-seeking	<i>“Yesterday I could not sleep because of the high fever. This also affects our children. Also, of recent, my younger brother called Babu and Ali they were killed by the incident of</i>

		<i>mosquito, as a result of this made me confirm that this malaria issue is a serious disease” (seen).</i>
Frequently Used Source	Major source of health information-seeking participants rely on	<i>“We got information through community interpersonal communication processes.” (Ardo)</i>
Lesser Used Sources	Other alternative source of health information seeking	<i>“I was able browse the website and find out some of the medicines we used are already obsolete based on recommendations from American and Western countries.” (Soni)</i>
Rare Used Source	Infrequent sources the participant use in health information-seeking	<i>“We found information about the tsetse fly through some groups of researchers who visited our community for research related to flies, and this gave us a chance to ask a question.” (Coop)</i>

RQ 4 What are the barriers rural residents encounter in addressing their health information needs and their seeking and searching behavior?

Examples of (Difficulties) Categories	Definition	Example of Participants' Quotes
Disease/Sickness	Various kind of diseases and sickness that affect the communities	<i>We have cases of typhoid, malaria and kidney disease, and also confirmed typhoid occurred as result of the unclean water we drink.” (Yosemer)</i>

		<i>“The cases of kidney [disease] for both humans and animals, we also confirm cases of ulcers, diabetes, high blood pressure. We have fewer cases of paralysis.” (Ardo)</i>
Lack of Social Infrastructures	Unavailability of basic social health infrastructure in the community	<i>We don’t have the government hospital that will treat malaria, typhoid, ulcers.” (Wure)</i> <i>“There is no availability of government health facilities that will help alleviate this problem.” (Qulock)</i>
Ecological Problems	The physical description of the environment the community’s lives	<i>“The nature of our place, even though it is a thick forest, we don’t have so much grass because it’s shady. This does not allow more grass to grow based on our assumption.” (Wure)</i>
Inability To Find Accurate/Reliable Information.	Participants’ inability to differentiate or evaluate the relevant and reliable health information they accessed.	<i>“I don’t know how to judge good or bad health information that comes to me, I just use it since I don’t have an option. Sometimes I will be lucky or fall into problems.” (Bick).</i>
Educational Status	The literacy level of community modern education	<i>“We need to address the problem of education related to health information, mainly through campaign</i>

		<i>awareness. We need more knowledge of how to take care of our health information and medical facilities. We do also need help in our educational system even though we have some but not as much required. However, we need a good school and teachers that will be more equipped to teach our community". (Nelson Shilding)</i>
Inability To Access Information	Participants' inability to finding information for which they were searching.	<i>"We don't have consistent health information resources and we don't have money to facilitate getting it." (Shilding)</i> <i>"I cannot estimate the amount of time I spent looking for information, but it takes long." (Awole)</i>
Socio-Economic Obstacles	Participant living standard which include occupation and personal profession	<i>"We don't have consistent health information resources and we don't have money to facilitate getting it." (Shilding)</i> <i>"It is like we are in a cage. The health information is available. We cannot access it." (Soni)</i>

3.4.4 Axial Coding

Another segment of the grounded theory approach is axial coding, defined by Strauss and Corbin (1990) as the process where categories are related to their sub-categories and these

relationship tested against data “because coding occurs around the axis of a category, linking categories at the level of properties and dimensions” (Strauss & Corbin, p. 123). In order to gain a more in-depth understanding of rural communities’ information-seeking needs, axial coding was applied from existing categories that emerged in the initial stage of open coding. This helped to formulate emerging themes from the categories generated, as the categories were systematically developed and linked with sub-categories. Axial coding is always connected to qualitative research techniques; this involves rigorous comparison of the emergent themes within data sets so as to create a theoretical framework of what the study is trying to explain.

To simplify the findings, the researcher further employed the standard practice axial coding paradigm of central phenomenon causal condition, strategies, context, interviewing condition, and consequence in conceptualizing the theory building. The questions asked included what the central phenomena of the study are; this implies the phenomenon, or central concept, to which all other categories are related (Strauss & Corbin, 1990). A “causal condition that influences the central phenomenon” refers to the factors that lead to the occurrence of the phenomena of the study. Similarly, the research will link the strategies in the paradigm that are used to address the central phenomena of the study. This involves the specific action or interaction as a result of the phenomena in what context the intervening condition shapes the strategies (Creswell et al., 2003). Finally, the question is: What are the consequences of using the strategies (Flick, 2014, p. 407)? The process of asking these questions guided the researcher to identify the major themes associated with the study. Below are examples of higher level categories linking the relationships of the categories of the participants’ responses described in the study.

Table 3 Coding Scheme: Examples of Higher-Level Categories

Major Categories	Open Coding Categories
Health Information	Tsetse Fly Diseases Mosquito Diseases Other Sickness/Diseases Uncertain Disease Health infrastructures Basic facilities Treatment and prevention
Resources Used	Traditional Techniques Modern Approach. Mobile Technology Approach Interpersonal Communication
Health Information-seeking Motivation	Treatment & Prevention Specific Health Issue Uncertain Disease Personal Well -Being Keep-updated n Recent Happening Emerging Diseases Quality of Life Causes of Death
Health Strategies & Process	Mobile phone use Interpersonal Communication Observation Self-Help Seeking
Difficulties in Information Access	Poor Health Infrastructure Ecological Problems Inability to find Accurate/Reliable Information. Educational Status Inability to Access Information Socio-Economic Obstacles Unavailability of sources Frequently Used Source Lesser Used Sources Rare Used Source
Health Infrastructures & Facilities	Poor Health Infrastructure Educational Status Clinic Hospital Schools

	<p>Veterinary clinic Borehole Dam Drug stores (chemist)</p>
Duration of Information	<p>Cannot estimate the amount of time spent It takes so long to look for information The medical personal available once a month. Research team occasionally visited Radio health program is a weekly broadcast</p>
Information satisfaction	<p>Health information not related Wrong application of drugs Un-trained health personal Not enough health information Fully satisfy Moderate satisfaction</p>
Recommendation	<p>Need solution to all those diseases we do not know Government should grow us grass to feed our livestock for more milk production. We need human and veterinary hospital. We need qualified medical personal We need the availability of health drugs Our road should be re-constructed We need good drainage We need good clean water We need more of adult literacy school We need quality teachers and renovate our school</p>
Disease/Sickness	<p>Asthma, Bakon Dauro (Hausa), Blood Transfusion, Cancer, Cholera, Diabetes, Discharge of Liquid Saliva, Eating Plastic, Elephantiasis, Feet worn out, excessive headache, Hight blood pressure, Kidney problem, Kirchi, Menstruation delay, paralysis, Severe pain in low part of stomach, Tari lala, tick, Typhoid, Ulcer, Watery eyes, Weight loss etc.</p>

3.4.5 Selective Coding

Selective coding can be represented as the peak of the pyramid at the base of which are open coding and axial coding; the middle of the top represents the selective concept of *central*

phenomena around which all the other categories are related. Having obtained the core concept of the study and the categories that are related to it in the axial coding process, the researcher proceeds to the last stage of theory building, applying the sequential practice of selective coding. Selective coding is a process of choosing one category to be the core category, or central theme, and relating all other categories to that category. The essential idea is to develop a single storyline around which all else is constructed. The purpose of selective coding is to integrate and refine the theory (Strauss & Corbin, 1990). For this reason, the researcher was able to create a proposition, or a statement hypothesis, of the research theory. This involved re-examination of the categories identified to find links or relationships among them. Those links help the study figure out the big picture of the storyline. The purpose of coding is to not only describe but, more importantly, to explain a phenomenon of interest (Hoepfl, 1997). This interpretation of data is the most important step in making sense of the data. The aim of this stage is to integrate what has been done into a meaningful and coherent picture of the data (Keeves, 1988; Stenhouse, 1988).

After coding the data of each question in the documents, the researcher created a table of code schemes to organize the categories of each question to find out the overall propensities across the communities' health information seeking. The processes were actively and conveniently achieved with the aid of NVivo application analysis software. Diagrams were also sketched to represent the participants during data collection exercise. The rigorous pattern of data comparison of the emergent themes within the data set through the axial coding process created an understanding of the theoretical framework of what the study uncovered. This axial coding paradigm included the central phenomena, causal condition, strategies, context, interviewing conditions, and consequence help in the conceptualization of theory building.

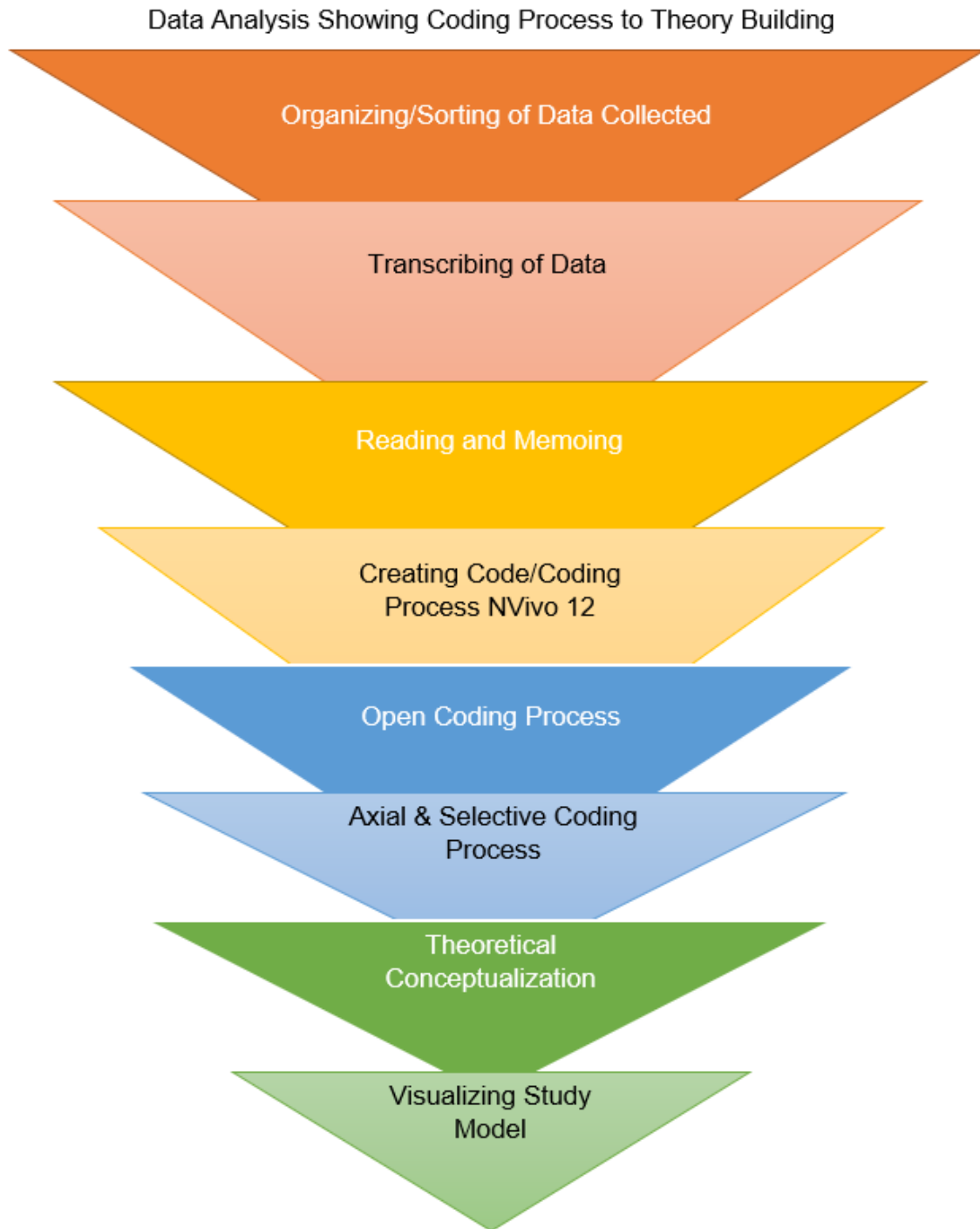


Figure 13 Data analysis process showing coding process to theory building.

3.4.6 Strength of Coding

This project's coding is an interpretive technique that both organizes the data and provides a means to introduce the interpretations of it into certain quantitative methods for inductive data analysis. The researcher followed several steps, including coding data, developing categories of subjects, and interpreting the subjects (Foss & Waters, 2003). The researcher identified the suitable interpretation of the coding categories that had already emerged and followed the grounded theory principle to analyze and derive the categories, organization, description, and interpretation (Mertler, 2008). Open coding, axial coding, and translating to selective coding helped to confirm and bring out the central phenomena the researcher was looking for (Hoepfl, 1997).

The point is whether or not these steps are linear. The answer to this question is "no." The researcher conducted these steps simultaneously and repeatedly (Gough & Scott, 2000; Hoepfl, 1997; Mertler, 2008). However, the most important thing the study took into consideration was the development of a quality coding process that enabled the researcher to break through subjectivity and bias. Selective coding is considered the final phase whereby categories are related to the core category which will justify the basis of grounded theory (Babchuk, 1996).

3.4.7 Validity and Reliability

As the core component of research testing, the reliability and validity of a survey are important. That is why this research used quantitative measures make sure of its stability, accuracy, and precision management (Healy & Perry, 2000; Yin, 1994). Furthermore, Robson (2002) defined internal validity as the extent to which a factor or variable found in the survey actually caused the effect found, an indication of how well the study was conducted. While external validity is defined

as an extension of research findings and conclusions from the study completed, it relates how applicable the finding to the real-world Robson (2002).

In order to improve reliability, the study earlier developed the research questions, paying attention to and in recognition of existing theories and models of information-seeking behavior related to health. Basically, a quantitative questionnaire on its own was less likely to be considered valid than the in-depth, qualitative triangulation method the semi-structured interviews and focus groups had. Mixed-method research combines the strength of both quantitative and qualitative approaches while at the same time compensating for the weakness of each method (Johnson & Onwuegbuzie, 2004). Another plus of the application of the triangulation approach for reliability is that it helped to corroborate the data findings.

Furthermore, in order to reduce bias, this study attempted to employ a sequential order of applying the data collection instruments, first the questionnaire, followed by the interview, and finally the focus group discussions.

3.4.8 Inter-Coder Reliability

The researcher and trained research Ph.D. coder worked together in the process of inter-coder reliability. The study independently created a standalone account in NVivo for the second coder to test the inter-coder reliability of the researcher in coding themes and categories. The whole set of data—questionnaire, interview, and focus group—was imported into the second coder NVivo stand-alone interface, which is different from the research NVivo interface. This allowed the second coder to freely interact with the data and make his analysis based on his understanding of the appropriate selected node container created by the researcher. The coder read and re-read sources of the node in NVivo software and assigned them in an appropriate container that was

already established by the researcher. The second coder coded 75% of all the data generated from questionnaire, focus group, and interview transcripts into 19 categories generated in an open coding process.

The goal is that all coders' codes should arrive at the same or similar result. This will confirm the validity of the coding process, as emphasized by Krippendorff (2004): when two or more coders reach agreement in the coding process, this is an indicator of the reliability of the coding process. Furthermore (Krippendorff, 2004, p. 215), the foremost living expert on inter-coder reliability in content analysis, states, "Agreement is what we measure; reliability is what we wish to infer from it." The researcher explained clearly in the beginning the intent of the study and what was expected from the second coder, which included the contextual understanding and the objectives of the research. Another plus of the second coder was that he knew the dimension of the research focus and had prior experience with health disease research in Africa, as he had conducted similar studies in the past.

Finally, the results of the comparison of inter-coder reliability were compared using Cohen's Kappa Coefficient, which showed an acceptable agreement of inter-coder reliability. To calculate the inter-coder reliability, the researcher used the coding comparison features that are available in NVivo 12 software, comparing the two coders, A and B, in which A represents the researcher and B the recruited Ph.D. researcher. The software ran the comparison analysis including all nodes (categories) coded by the two coders using the Kappa Coefficient. The results displayed the agreement of the two coders in percentages based on what was coded. NVivo calculated the Kappa Coefficient and percentage agreement individually for each combination of node and sources. However, the coding comparison query was exported from NVivo as a

spreadsheet using the expert list command, which allowed the calculation of average Kappa Coefficient percentage of agreement across multiple sources or nodes.

The results fell within a high measure of reliability at $K=0.94$. Cohen's Kappa testing is a more robust measure of the agreement of occurring terms. This is the ability of inter-coder reliability to cope with errors during data measurements. Because it represents the extent to which the data collected are correctly represented in a variable measure (McHugh, 2012), Kappa provided a good measure to determine how closely two judges are in agreement with their coding.

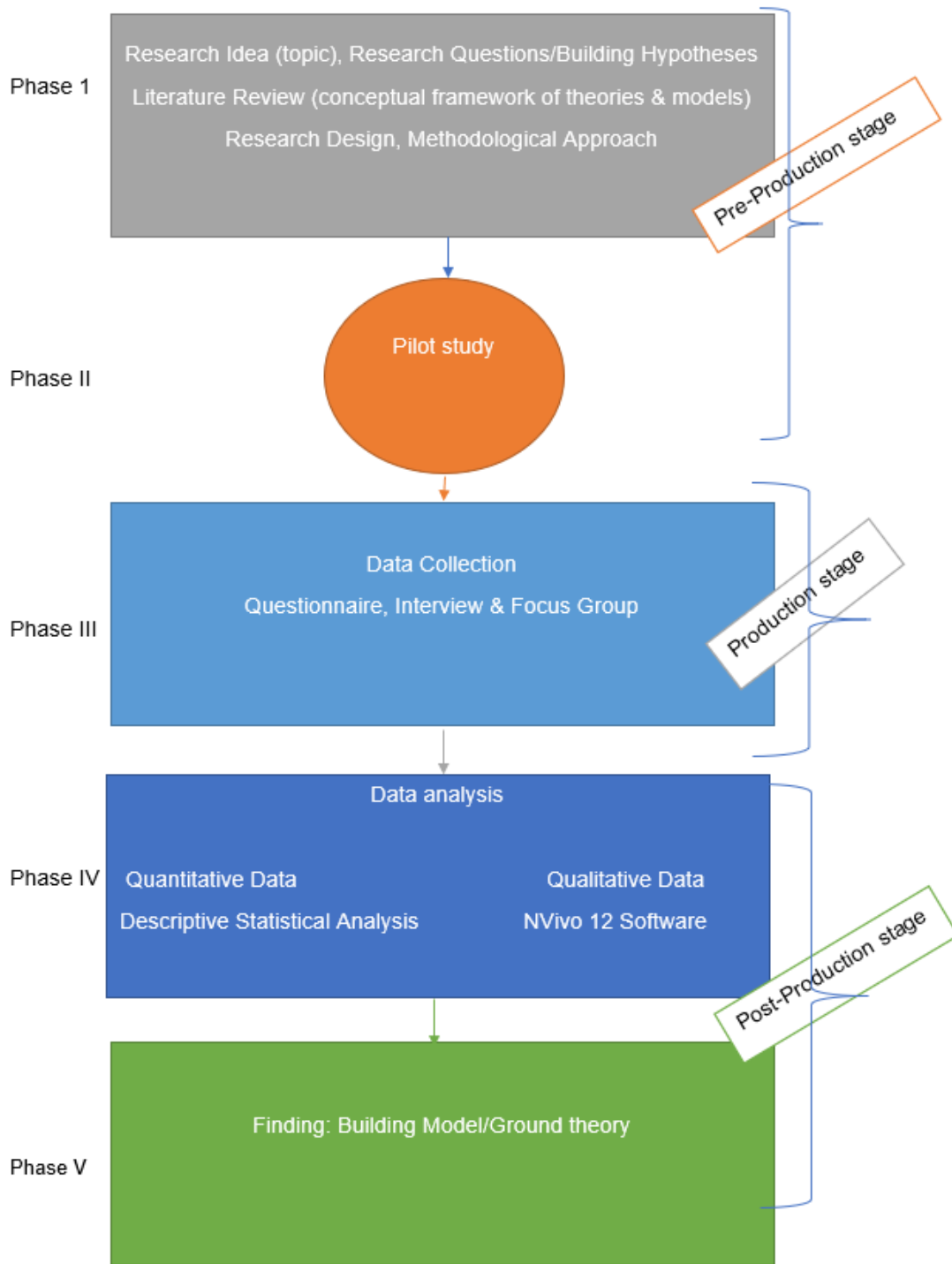


Figure 14 Research design (overall diagram) showing the summary of research as adapted from Pickard (2013).

CHAPTER 4

Findings

4.1 Introduction

This chapter presents the brief descriptive statistical and qualitative findings of the research conducted in December 2017 of the consumer health information-seeking behaviors among the rural communities of Ladduga, Nigeria. The study aims to understand consumer health information seeking-behavior (CHISB) in the rural communities. The chapter discusses several issues related to results of the study. The chapter divides the results of the discussion into report of descriptive statistic noted by the research related to the brief history of the community, the demographic data, the participants representation in the study, the gender and educational status of the community. The other part of the finding reports the qualitative finding of the community health information, needs, factors influencing information needs, information-seeking and -searching behavior, the source the residents rely on, and the difficulties they have while searching for the health information.

The results of the study are based on a qualitative analysis using NVivo software and manual analysis. The findings are discussed based on the research questions and the responses of the participants, who are represented with pseudonyms. The findings explain the major themes generated as a result of grounded theory coding analysis. The research answers the question of the community health information need, the seeking and searching behaviors, the factors that influenced residents' information seeking, the sources they used in information seeking, and the challenges they encountered while in the process. Findings are accompanied by direct quotes from participants to illustrate the findings. The quotes represent the intended meaning of the speaker

and are not the word-for-word translations, which would come across as awkwardly expressed in English. The names accompanying the quotes are pseudonyms to protect the identities of the participants. The results are organized by the research questions guiding the study.

4.1.1 History of the Community

The community consisted primarily of members of the Fulani tribe located in the grazing reserve where livestock management was the major occupation. The major town in the area is Tarpaul. The name is derived from the English word tarpaulin as a result of an earlier school established for adult literacy in the 1960s made of tarpaulin products. The town also covers other communities located in the six blocks including Wuro Nyko, Nassarawa, Wuro Fulbe, Wuro Modi, Wuro Saleh, Tilde Bayero, Mayo Borno, Mayo Jamil, Mayo Ardo, Mayo Wuse, and Ladugga. The community has about 50 primary schools for elementary education and one central secondary school in the Ladduga Tarpaul area. It has a central market where all the communities around gather weekly on Friday to buy and sell products, including major livestock.

Religion is very important to the community's way of life. Islamic schools have been established, including the Al-Garkawi school facilitated by a renowned Islamic scholar teaching in Kaduna. The community also includes various prayer places called mosques. The community has four small clinics that address their major health concerns. The study revealed many development projects that the government and non-governmental organizations have provided to the community, including a few drainages for water, the building of a center in Wuren Yako for educational literary and computer access, the building of minor bridges, etc.

4.1.2 Difficulties and Challenges Encountered in the Data Collection

Data collection is an essential aspect of research design, as inappropriate data collected could invalidate the results of a study. This process involves the gathering of research information in a systematic way to be able to answer research questions. There are a variety of different methods of data collection that cut across scientific and social science research. Many research studies in the social sciences rely on data collection methods that include questionnaires, interviews, and focus group discussions. These are considered Western approaches and may have negative perceptions for Africans, most especially in Nigeria, where the study took place.

The data collection process revealed many of the ups and downs associated with fielding the questionnaires, conducting interviews, and focus group discussions. Challenges included the recruitment of participants in rural communities, acquainting participants with the process of conducting a questionnaire or a recorded interview, jotting down research information on paper, and gathering participants in one place for focus group discussions. These data collection methods are not a usual practice in rural Africa, as they are considered Western. As previously discussed in the methodology chapter, appropriate research protocols were followed by the study to adhere to the ethical norms of conducting the human subjects research. These protocols included the standard IRB protocol, conducting a pilot study, recruitment of subjects, obtaining informed consent, and administering the data collection instrument.

Despite that, the African context, where the research was carried out, did not always adhere to these protocols. In fact, the researcher encountered numerous problems associated with African culture. As indicated above, the data instrument used for the study was considered by default more

Western-compliant and not necessarily adaptable in the African societies, in particular rural Nigeria.

Some of these problems included the recruitment of participants for the study. This process proved tough, as most people were willing to participate, but involving everyone who expressed an interest would make it difficult for the researcher. To satisfy everyone's wishes, the study had to devise a means of including the many participants who requested to participate, which was to administer the questionnaire, etc., out of context. This meant some participated, but their responses were not reported in the findings. Nonetheless, they were happy as "participants." Doing this helped to overcome the negative perception by residents that some were chosen while others were not.

Another challenge encountered was the representation of women in the study. Despite their willingness to participate, women could not freely consent to participate without the permission of their husband, father, or guardian. This resulted in situations where the researcher had to wait for the husband to provide the final permission before embarking on the data collection process. In addition, another challenge was the influence of the community leader in the selection of participants. Based on the IRB requirement, the researcher should not allow any factors to influence whether participants were included or not. It was to be strictly optional, and the participants should have the right to participate or not, or to withdraw participation at any point, but the case in the rural area the study visited is different. The rural community leaders, or traditional titleholders, are significant and respected; they have influence and control over residents' in daily activities. To avoid this problem, the researcher conducted a separate

recruitment process for participants not on the participant list provided by the village head. This approach helped establish confidence that those who participated were not forced to do so.

Another sensitive issue the study carefully addressed was the involvement of physically disadvantaged people in the study. In some African settings, people with disabilities are sometimes neglected or they are underrepresented. The study had to separately recruit and administer the data collection instrument, privately adding those categories of people.

Further problems encountered included how some of the research questions in the data collection instruments used tended to be offensive or sensitive, even though in Western culture those questions would be reasonable to ask. For example, it is very weird in the community where the study was conducted to ask the question “How old are you?” Or some research variables used are often taboo, for example, the issue of participant health or income. This made the participant suspicious, “Why me?” (Why me to answer the question, why am I selected to answer this question, what is the motive for selecting me, am I being recorded, why does this need to be recorded anyway, why the script is being taken to America, etc.).

To avoid this, the researcher explained in detail the questions that were to be asked and why the participants were being recorded. It often took a long time to explain the objective of the research and its consequences. Fortunately, the researcher was able to establish the confidence of the participants. One of the main reasons that allowed participants to relax was knowing that the principal researcher came from the same community the research was investigating. He and they shared the same culture, language, and religion, which greatly helped to reassure the participants, allowing them to cooperate and respond to the research questions.

Also, another problem was translating the questions written in English into the local Hausa language. For example, it is easy in English to have multiple answers to a question such as, “How satisfied are you with the health information you obtain?” The answer can be (a) Extremely satisfied, (b) Very satisfied (c) Moderately satisfied (d) Slightly satisfied (e) Not at all satisfied. However, the answer in a local Hausa or Fulani language is either Yes or No (i.e., Satisfied or Not).





Figure 15 Two focus group discussions.

Another challenge encountered in the data collection were the distribution of incentives, or token gifts, to participants. This is unusual in an African setting, in that typically whoever agrees to participate in something does so voluntarily, without expecting to get anything in return. This approach was misunderstood and gave a negative impression to the communities, whose members assumed the researcher was an agent of the Western world coming to learn their secrets. The situation might have been tense if the researcher had publicized what would be given to each participant when they agreed to attend any of data collection sessions. This could actually have led to threats on the researcher's life, as everyone wanted to participate in order to get the incentive. Furthermore, the traditional setting of the people does not allow a person to trade his or her information for money. Locals regard it as a responsibility and gesture to help with information. The study avoided this problem by privately distributing the incentives to whoever agreed to accept it; this bypassed the IRB protocols, which requires announcing the incentives in the midst of the participants.

Insecurity and political tension were among the other problems the study encountered during the data collection. The location visited for the study suffered the menace of a high rate of kidnapping of some important figures, who were held for ransom until a huge amount of amount money was given for their release. A piece of clear evidence was the kidnapping one of the high-ranking traditional kings by unknown people at the time of research visit. He (the king) was eventually released after paying a considerable sum of money. This problem is sometimes unavoidable; the researcher chose to take the risk.

Furthermore, the study also faced the challenge of misperceptions about the objective of the study by the participants as to why their community was selected to be involved in the research. They tended to assume the research was to track their daily activities in a negative way or to advance another group in achieving a particular political ambition. They generally felt observed or judged, such as when signing the consent form. Because signing a consent form is something new in rural African culture, a participant might agree to answer the questions but would be skeptical about signing. To them, having agreed to engage in the research conversation was enough to establish evidence of their voluntary participation. However, the process of signing one or more documents triggered suspicion that they were being tricked, tracked, or documented. The researcher was able to convince the participants why the consent form was needed by further establishing a practical example of ethical protection. These assurances helped greatly to overcome their doubt.

Similarly, the researcher came across problems associated with food, water, accommodations, and the road network. As indicated in the Introduction, the area where the research was conducted is a remote rural setting where people lack the necessary infrastructure,

including a good road network. Having access to the community is difficult. It takes hours to drive in the tar road full of bumps, slop, and ridges; this discourages many researchers from embarking on their studies in a community like this.

Another problem is the unavailability of clean water to drink, clean food to eat, and a better place to sleep. One of the most significant tasks a researcher should undertake while collecting data in a rural setting is to establish and build the confidence of the people visited as to get the maximum cooperation from them. In order to do this, the researcher had to compromise some of his personal requirements in terms of what to eat and drink and where to sleep. Previous knowledge of rural community studies confirmed that local residents accept a person and are willing to interact with someone who is willing to share their food, drink their water, and sleep with them in the same village. However, it was difficult for the researcher to comply with those requirements in order to gain full acceptance, since most of the local water was not hygienic—most residents drink unfiltered water from the streams. Consequently, failure to respect and recognize these local customs might have led to a lack of confidence in the researcher and might have affected the answers to the questions. The compromise the researcher adopted was to agree to flow with the community way of life, since this was temporary.

Other problems encountered included environment hazards such as dust, heat, and some small, dangerous animals, including scorpions, snake-biting flies, insects, and termites. Any sickness that the researcher might have developed would have been difficult to address because of the lack of medication and authentic medical care. Many types of illnesses can be found in the communities as a result of the environment, including malaria, an outbreak of contagious diseases, dehydration as a result of heat, etc. Prior to the main study, the researcher had to adopt appropriate

precautions to protect himself from such occurrences. This information about how to do this was gathered during the pilot study visit to the community. Some of the precautions included immunizing himself against malaria, having enough drugs to be useful, and carrying protective gear such as a dust mask, gloves, jungle shoes, etc.



Figure 16 The environment of the community.

Another problem was consent given to the researcher by participants to take their personal photos. Although the IRB discourages the taking of personal photos, the participants often asked that their picture be taken and used. There was situation in which one of the respondents threatened to decline his interview if the researcher would not take his picture and use it in the research report. Finally, another problem while conducting the data collection was the reporting time of the participants to be interviewed or participate in the focus group discussion. Despite the stipulated time and place agreed upon for researcher and participant to meet, the participants would fail to show up, or declined the session. It was not just that they forgot or were unwilling or dropped out, but they were overwhelmed with personal and occupational activities. The researcher discovered their daily livestock, farming, or other occupational activities were paramount to other promises they had made. Hence, they addressed their top-priority activities. This forced the researcher to keep changing and moving the meeting times.



Figure 17 Female focus group discussion.

4.1.3 Participants in the study

There were a total of 50 consenting adult participants in a triangulation approach of interviews, questionnaires, and focus groups. Twenty-one participants were female and 29 were male. Both females and males participated in all three areas of data collection: interview, questionnaire, and focus group. Of the 16 subjects who answered the paper-based questionnaire; nine participants responded in Arabic, writing in the Ajami script, and seven participants responded in the Hausa language writing script.

To provide wider coverage, the sample was comprised of participants from almost all the cluster areas of the grazing reserve communities, including the areas Wuro Nyko, Nassarawa, Wuro Fulbe, Wuro Modi, Wuro Saleh, Tilde Bayero, Mayo Borno, Mayo Jamil, Mayo Ardo, Mayo Wuse, and Ladduga. The participants came largely from the Fulani and Hausa tribes, who primarily spoke the Fulfulde language. It was very difficult to complete interviews with more than seven people a day due to the nature of rural people's way of life and how they desired to respond to the researcher. The study had pre-tested some of the participants in the pre-research survey conducted before the main research work. The follow-ups to the main research work lasted for seven days, fielding the questionnaires and collecting the interview and focus group data from the participants.



Figure 18 Part of the community.

Table 4 Ethnic Demography of Residents in Ladduga Grazing Reserve

Ethnicity	Frequency	Percentage
Fulani	47	94%
Hausa	3	6%
TOTAL	50	100%

4.1.4 Age, Gender, and Marital Status

Table 5 Age of the Participants in the Survey

Age Range	Frequency	Percentage
18-30	4	25%
31-40	6	37.5%
41-50	4	25%
51-60	2	12.5%
60 above	0	Nil
Total	16	100%

The number of young participants is not a surprising, as Nigeria, based on the last census, was shown to have the highest number of people ranging from 23 to 40 years of age (Salami, 2013). Having representation in those categories of age groups is a plus to the study because those in this

age range are more proactive within the society and have a lot to say related to what is going on in the society (Iwasaki et al., 2014).

Table 6 Participants' Gender Cases by Attribute Value

Participants Gender	Number of Matching Cases
Female	21
Male	29
Unassigned	Nil

Table 7 Marriage Status of the Participants

Marital Status	Frequency	Percentage
Married	47	94%
Divorced	1	2%
Never Married	2	4%
TOTAL	40	100%

There were 18 interview participants, of whom eight were female and 10 were male. The focus group discussions were comprised of 16 subjects who participated in one of three sessions. The discussion groups were classified into three groups; male elders, male youth, and females. Six women attended the female group, while the youth and elders' sessions had five respondents each. Table 6 summarizes the gender representation for each of the data collection methods. There was reasonably fair representation of each gender across the data collection methods, particularly

considering the nature of the community the study investigated, and the cultural taboos where females are not allowed to actively participate in activities of this kind.

Table 8 Representation of Male and Female Participants in the Study

Gender	Research instrument	Frequency	Percentage
Male	Focus Group	10	20%
Female	Focus Group	6	12%
Male	Interview	9	18%
Female	Interview	9	18%
Male	Questionnaire	10	20%
Female	Questionnaire	6	12%
TOTAL		50	100%

4.1.5 Educational Level of Participants

The majority of the participants possessed at least a primary school education and Islamic knowledge, as they can read and write. The literacy level was grouped into three categories: 1) people who could read and write in the English language because of their Western education background, 2) people who attended either Islamic, Western, or adult literacy classes who had the ability to read and write in the Hausa language script, E) people who had only Islamic education, with the ability to read and write in Arabic Ajami script.

Table 9 Level of Education

Respondents level of education	Frequency	Percentage
Islamic Education (Basic Arabic and Islamic religion Knowledge demonstrating reading and writing in Ajami script)	18	36%
Adult Literacy (Western Education)	8	16%
Primary/Elementary Education (Western Education)	10	20%
Secondary/Middle-High School Education (Western Education)	10	20%
Tertiary/Collage/University Education (Western Education)	4	8%
Total	50	100%

4.1.6 Economic Status

The participants were actively involved in livestock keeping and crop production as their primary occupation. The economic status of the participants was low, as they lacked the basic infrastructure that would enhance their livelihoods. A handful of respondents used mobile service even though the mobile reception network was poor. Mostly they used traditional methods of communication through interpersonal exchange of information. The communication system was also connected to the transportation system. The lack of good roads has made it difficult for the communities to interact with each other easily, most especially in the rainy season.

The income level of the residents is low considering the remote location of the community. The residents of the communities studied mostly lived a modest life, and they depended on agricultural and pastoral production for their survival. The few sons and daughters who were

privileged with Western education found work in the city. Table 8 summarizes the occupations of the participants. Note that participants could indicate more than one occupation, so they might be counted more than once. The percentage reflects the total number of participants (50).

Table 10 Residents' Occupations

Type of occupation	Gender	Frequency	Percentage
Livestock production	Male & Female	48	96%
Farmer	Male	32	64%
Traders	Male	5	10%
Civil worker	Male	5	10%
Teachers	Male	2	4%
Traditional title holders	Male	8	16%
Health personnel	Male & Female	6	12%

As also illustrated in the table above, the residents were actively engaged in the occupation of cattle rearing. This is not surprising, because most of the people who responded to invitations to participate in the study were of the Fulani tribe. Livestock production is commonly found to be their way of life and living in a remote grassland or bush area is part of the survival of their cattle. This occupation can be traced back in the history of Fulani, or Fula, tribe in Africa. The cattle-rearing occupation is followed by farming; farmers also constituted a reasonable representation of the Fulani community. Few people were involved in trading activities, including providing groceries. The researcher observed a small shop selling different household items for daily life as

well as a chemist selling drugs for humans. Other participants who attained a higher level of education found a job teaching at the primary schools within or near the community. Also, some of the residents of the community were the medical personnel providing basic health services, while the rest were traditional titleholders, governing the affairs of the community.

4.2 RQ 1 What are the Health Information Needs of Rural Residents in the Kachia Grazing Reserve, Nigeria?

The study discovered various needs the communities indicated they were interested in knowing regarding their health information. Those needs are classified into four groups: information needs about the tsetse fly, information needs about mosquitos, general health information needs regarding diseases and sicknesses other than that of the tsetse fly and mosquito, and the interest the communities showed in basic health infrastructure.

4.2.1 Tsetse Fly Information Needs

Tsetse fly information needs is one of the core research questions of the study. The tsetse fly is a disease vector of great economic importance, as it carries the *Trypanosoma brucei* parasite that is responsible for the trypanosomiasis infection. Trypanosomiasis is an infectious disease in humans and animals of similar etiology and epidemiology. The human form of African Trypanosomiasis, commonly known as “sleeping sickness,” is found in some African nations, including Nigeria. The same disease is called “Chagas Disease” in South America. Trypanosomiasis is caused by two subspecies of *Trypanosoma brucei*: *Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense*. *Trypanosoma brucei brucei*, a third subspecies, is only infectious to animals. *Trypanosoma brucei gambiense* is responsible for the chronic form of sleeping sickness in West and Central Africa, whereas *Trypanosoma brucei cruzi* and

rhodesiense have permeated East Africa, Southern Africa, and Latin America. The study revealed and identified key information needs the residents have related to the tsetse fly. These included information about the disease's cause, the symptoms, characteristics of the fly and its life cycle, and the treatment, as discussed below.

4.2.1.1 Information Needs about Tsetse Fly Diseases

The study discovered that participants had little or no knowledge of the causes of the diseases. For this reason, they were looking for information about what tsetse fly bites caused for them and their animals. As some of the respondents stated:

“I am interested in searching for information on how the tsetse fly transmits disease and how to prevent myself from getting it.” (Homly).

“I look for information on the effect of the disease, what are the prevention measures and the drugs used to cure them.” (Turone).

I was told tsetse flies suck blood from humans and animals and cause diseases like sleeping sickness. They are mostly found in ponds and riverbanks but still I am looking for more information on why they suck blood and cause sickness in us and animals” (Turone).

Having recognized the fact that tsetse fly bites transmit disease and cause various types of sickness in humans and animals, the community showed great interest in learning more about what the flies can cause.

“I know tsetse flies bite animals and people and live in riverbanks or ponds, but I am yet to understand much about the fly. This is what makes me look for information related the flies.” (Rolew)

“I am interested in knowing more about the tsetse fly because tsetse flies bite our animals and cause sleeping sickness.” (Umoy)

4.2.1.2 Information Needs about Tsetse Fly Disease Symptoms

The results of the study further confirmed that the community has long suffered from the problem of trypanosomiasis disease that affects both humans and animals. The disease is called “Sammore” in the local Fulfulde language, meaning trypanosomiasis. It is believed to be the cause of the trypanosomiasis disease in animals and sleeping sickness in humans, as confirmed by a male participant in his response to the questionnaire.

“I am looking for information to know more about what [diseases] the tsetse fly causes because it’s a dangerous insect that bites our cattle and causes the disease Sammore [trypanosomiasis in Fulfulde].” (Cusy)

His statement confirmed the preliminary information stated in previous studies, that the tsetse fly caused a lot of problems in the community. Furthermore, a similar statement was reported by a participant in an interview session in which he stated that they considered the tsetse fly a deadly insect that was seriously troubling their animals.

“We need to know more about the tsetse fly because it carries a deadly disease. They bite our animals and cause the sickness of trypanosomiasis.” (Umoy).

“I am looking to know how the insect (tsetse fly) carries disease and spreads it to humans and animals.” (Bick)

Uniformly the community members agreed they had problems with the tsetse fly in their area and concluded the disease was deadly among them, since it affected their daily social activities. With most of the community agreed how deadly the tsetse fly was, the findings further revealed that the participants were able to identify some of the symptoms it caused in both humans and animals even though it had not been scientifically tested and confirmed, as indicated by another participant in the interview session,

“Since the tsetse fly causes the animal to discharge liquid saliva and the feet of the animal to wear out (SABEWA in Hausa) . . . I need to know why this is happening.” (Deely)

The study recognized the longtime community connection with flies and the diseases, creating more awareness and knowledge of the flies. As one of the participants remarked in the focus group discussion, *“We learn by mistake and the long time we are in problems has created a possibility of learning as time passes.”* (Clowel). For this reason, the community identified various sicknesses caused as a result of the fly infection and summed it up to be deadly.

“It kills our animals and affects humans with the disease called sleeping sickness. I am looking for information about how to stop the problem of killing our animals.” (Bolock)

“Our animals are affected with SAMMORE disease as result of the tsetse fly. The cattle suffer the symptom of shrinking that leads to death. We need to know why this is happening and what causes it.” (Yosemer)

“I need to know how we can prevent the sickness, for example, where the symptoms include watery eyes in animals.” (Hored)

“Also, you will find animals eating from plastic bags and that they behave differently. Why is that happening? I need that information because it is very strange.” (Fule)

“There is constant movement of livestock out of the grazing reserve as result of high incidents of the disease in our area. Because of this problem I am looking for information on how to stop this so that we can stay in our permanent location.” (Sukko)

“We also discover it causes the loss of pregnancy or prevents women getting pregnant.” (Seen)

Similarly, a number of participants in the study stated that some of the symptoms in humans the flies caused in the communities included sleeping sickness, elephantiasis, miscarriage, body fever, painful sores after the flies bite, vomiting, skin rashes, high fever, severe headache, muscle pain, itchiness, swollen face, swollen lymph nodes, and weight loss. In animals, the symptoms included eating plastic bags, swollen ears, watery eyes, and trypanosomiasis.

“We are looking for information about the disease because it is hard. You may find people in the community who are sick. Almost everyday people and livestock get sick as a result of tsetse flies and mosquitos.” (Qulock)

4.2.1.3 Information Needs about Physical Features of the Tsetse Fly

The disease caused by tsetse flies remains a problem, as the research found out that the community until now has not yet figured out exactly which type of fly the tsetse fly is. The study found that the communities have different names they use to categorize the tsetse fly. These names include lodi, mukko, bokkarre, and lallili, as described below:

“Almost every day we engage in information-seeking related to the tsetse fly because it is a part of us. The diseases include trypanosomiasis sleeping sickness and also mosquito- caused malaria and other flies which we call BOKKARE and LODI (in the local language) causes other disease. They are very big, and it is very severe and deadly when they bite. It reaches to the extent there are times when a group of cattle had to migrate from the reserve to other areas down south as a result of these problems. For this reason, we are greatly in need of information to assist us with these problems.” (Ardo)

“I need information about the tsetse fly because they are so many and they bite humans and animals in which they cause disease, we called them SAMMORE and it causes sleeping sickness.” (Awole)

“I know tsetse fly has diseases that cause problems in humans and it looks like a house fly although it is bigger. That is what makes me engage always to know more about it to protect myself.” (Bule)

“Another fly called MUBAI ko LODI affects animal and the MUBAI suck people’s blood. There are also other flies called BOKKARE and MUKKO but the MUKKO does not affect us. We need more information about those flies because it gives us a hard time.” (Sween)

“BORU is another sort of insect that we don’t know much about, but it looks similar to the tsetse fly. It affects our animals also, so I am deeply interested to know more about it.” (Deely)

These responses indicate that the community has little knowledge of the tsetse fly, as they could not identify or differentiate other flies from the tsetse fly. Nevertheless, the study found that a few residents applied traditional knowledge and practical life experience to distinguish the tsetse fly from other biting insects. As other respondents stated:

“We have a small kind of tick that we have not identified, is not common with us, but they bite and suck blood, called the LALLILI. We are looking for information about it. To date we haven’t found any information.” (Gooles)

“We observed the LODI are biting flies. While MUCO are very small and suck blood of humans and animals. In animals they suck blood around the animal’s ear, nose or sensitive places where the skin is soft. But still it is a mystery. We could not find any information about them that causes me to continue searching. Maybe I will come across something that I can share with my community.” (Wure)

“A good example is that no one will go near any animal and stay long without being bitten by the tsetse fly. It’s a really a disturbing insect.” (Puloyl).

The environment the participants live in is largely a deep forest with thick trees and swampy slopes where different varieties of flies can be found. The overwhelming number of flies and low level of awareness, especially their educational status, prevents community members from being able to differentiate between the tsetse fly and other flies, yet they think all are dangerous, even though a few are not. Because of this, the community members engaged in tsetse fly information-seeking related to its features and characteristics, as stated in numerous responses of most participants in the study:

“I am looking for information related to the tsetse fly because it causes a lot of problems to human health.” (Bule)

“I want to know information about how the tsetse fly transmits disease and how to prevent my animals [from getting infected].” (Homily)

4.2.1.4 Information Needs about the Tsetse Fly Life Cycle

The study further identified some of the information needed by the communities related to the tsetse fly, including information about the tsetse fly life cycle, how it reproduces, and what the different measures are that are used to eliminate the disease. Also, the communities wanted to

know the outcome of research conducted related to the tsetse fly, since they had seen numerous research groups visiting their community conducting research on trypanosomiasis.

“The information I need about the tsetse fly is of its life cycle in order to protect ourselves and our animals.” (Coop)

“I heard information that the tsetse fly sucks blood from humans and animals, I want to know its origin (reproduction).” (Turone).

“I want to know the outcome of some of the studies conducted in our communities in the past related to how the flies reproduce.” (Bule)

Most of the respondents remarked that they need to know what the tsetse fly looks like and how it reproduces. They stated that having knowledge of the fly would be a step to developing a method to protect themselves from the disease. This was a remark by one of the participants in focus group discussion: *“ . . . I cannot handle something that I didn't know its origin (life cycle) and how it multiplies, but if I have knowledge on it, I will tackle it in my own way.” (Osleb).*

4.2.1.5 Information Needs about the Treatment of Tsetse Fly Infection

Treatment of the disease caused by the fly was a paramount issue and was the subject of discussion in the community. The study recognized that the community showed strong interest in looking for information related to the medicinal treatment of trypanosomiasis diseases in both humans and animals. These included drugs to be used and other modern eradication tools and techniques.

“We normally try different types of medicine, mostly modern medicine. I can remember sometime back we tried a drug called IVOMIN, FOR ALL (spelling not confirmed), but they were not successful until when we try TOPLIGH drug (spelling not confirmed) that the Nomadic Education in Kaduna introduced to us.” (Gooles)

“I want information on how to protect myself and my family. We usually use medicine in the form of an ointment and apply (repellant) it to the lower part of the livestock to reduce the excessive bite of the flies.” (Seen)

“We rely on the use of medical personnel and hospitals in finding the cure and treatment?” (Qulock)

Even though, as revealed in the study, the majority of the respondents indicated various ways they used for the control and treatment of the diseases, still there were handful of residents who had no knowledge of how to address their health concerns related to the tsetse fly. Some of the sources they used for treatment were expensive, and when they could afford those, they relied on traditional forms of medication.

“We normally find some medicine in the form of an ointment (repellant) to apply to the lower part of the animal to reduce excessive bites of the tsetse fly.” (Sumuon)

4.2.2 Mosquito Information Needs

The community information needs about mosquitos—and the malaria caused by it—were similar to what was discussed above about the information needed about the tsetse fly. Some of the information they need included what caused the mosquitos to settle in their environment and what measures could be taken to eradicate the mosquitos. As with the tsetse fly, most of the respondents wanted to know the life cycle of the mosquito, how it reproduces, and what makes it reproduce. The study revealed that some of the participants had some knowledge of mosquitos, as some of the participants interviewed reported:

“A mosquito is an insect that originates as result of a lack of a clean environment and household.” (Homly)

“The problem lies in the lack of a cooperative understanding among the community in cleaning all our houses. For example, if I clean my house and my neighbor doesn’t, still, I am not free from the contamination of the flies. This is because our drainage system is not like those of the cities or foreign countries that are covered. Our houses serve as reservoirs for mosquito eggs.” (Mutade)

“I also confirmed if the drug is not active (up to date) it will not cure high incidents of malaria infection such as in the brain, like cerebral malaria.” (Yose)

4.2.2.1 Information Needs about Diseases Caused by Mosquitos

Various statements about what diseases the mosquito causes were discovered in the study. This was not surprising, because of the level of understanding the community had about the disease of malaria as result of being bitten by a mosquito was relatively low. They attributed different kinds of sicknesses to the mosquito, but all centered on the malaria fever or high fever. The researcher noticed that the severity of the symptoms caused by mosquito-borne diseases caused the community to misinterpret malaria as a different kind of sickness. One example was one of the participants assumed the high malaria fever was caused by madness or mental illness.

“ . . . suffer a high fever, become unconscious and act like a mad man. For example, when my children suffer with a high fever, they hold my beard too hard. It takes so much pressure to remove his hand from my beard.” (Ardo)

“I have severe pain in the low part of my stomach.” (Wure)

“One of the female daughters was chained because she behaved mad due to loss of consciousness as a result of high fever.” (Fule)

“A pregnant woman who came for delivery was brought to the hospital vomiting blood, her leg swollen, with a high fever. The situation required about 4 bags of blood.” (Awole)

4.2.2.2 Information Needs Regarding Symptoms of Mosquito-Borne Diseases

The study confirmed uniformly that respondents recognized the symptoms caused by mosquitos more easily than those of the tsetse fly. As a participant in the questionnaire stated:

“The obvious thing identified if one is infected is the high body temperature that causes shivering and later turns to a very high fever.” (Wure).

“Children have a high fever as result of malaria causes by mosquitos.” (Floore)

“ . . . result to vomiting yellowish liquid. It also affects our families including adults.” (Female)

“I want to know information related to the immediate sign of the fever whether my family or I am infected with malaria.” (Homly)

“Causes a lot of high fever.” (Clowel)

“If I have a malaria symptom that affects my body, I begin to feel a high fever, or weakness.”

(Hored)

“Symptoms include that the animal will have watery eyes, or part of his body hair rises up, or [it produces a] low amount of milk or the death of young calf due to the skin being soft, which we suspect are caused by mosquitos. Also, we have another species of fly we called BOKKARE they are in between the size of mosquitos and tsetse fly. Their bite is so severe and painful.” (Ardo).

An interesting finding the study revealed was that some of the participants had prior experience with the sources of the mosquito. As one of the participants indicated:

“Malaria and the mosquito are found in the place where there is so much still water where they lay their eggs, and from there they spread in our community, and their bite causes malaria.” (Clowel).

Also, another participant in the focus group indicated:

“The information I want most is how long it takes for the symptoms of the mosquito bite to start.” (Dukole)

The following reports additionally confirmed the awareness the community had about the mosquito as compared to the tsetse fly.

“We think it is caused by lack of cleanliness or a lot of still (poor drainage) water and the thickness of forest where we live.” (Wure)

“It causes a lot of malaria” (Hored)

“Yesterday I could not sleep because of the high fever. This also affects our children., Also, recently my younger brothers, called Babu and Ali, died as result of high incidence of malaria caused by the mosquitos.” (Seen)

“We have problems with getting more blood (for transfusions).” (Biok)

The study noted the reason why the residents had more information about mosquitos than the tsetse fly is that here is a greater presence of the mosquito in their immediate environment, while the tsetse fly lives in thick forests or swampy areas.

4.2.2.3 Information Needs about the Mosquito's Life Cycle

Similar to what was discussed about the tsetse fly, the participants studied showed interest in knowing about the mosquito life cycle and how it reproduces:

“I know mosquitos are deadly, but I need to know more about how it reproduces.” (Turone)

The study revealed many reasons why participants needed to know the how the mosquito reproduces. Participants were curious about this, as well as the life cycle of the flies. They wanted this information as a way to overcome the problems the mosquitos were causing to their health and that of their livestock.

4.2.2.4 Information Needs about the Treatment of Mosquito Infection

The study revealed various approaches the respondents used in treating the problems associated with mosquitos. Most of the participants reported they used the local clinic that had been established by a resident doctor who addressed their emergent problems. The participants reported severe cases of malaria. As previous studies confirmed, the presence of mosquitos is more related to the nature of the current research setting, where all conditions to host the mosquitos are available. This include the lack of clean water, bad drainage etc. (In comparison to the tsetse fly, these flies largely live in bushy areas.) Some of these situations resulted in the hospitalization of the affected persons and led to death.

“We are encountering a lot of disease in our community. Some of our children are be infected with malaria symptoms but instead of rushing them to hospital they were left to apply some

unadministered drug such as PANADOL (Over the counter pain reliever) or drug recommended by traditional medicine personnel.” (Bube)

“A little boy can have a blood transfusion of 2 or 3 bags, and after some time still the problem of malaria comes back, and [the child] needs more blood or water (drip).” (Osleb)

“The general problem we are facing is malaria . . . ” (Clowel)

“One of my sons recently suffered the high fever called (Haboje) as result of malaria and was unconscious, acting like a mad person, and hard to control.” (Sukko)

“For example. almost every two weeks, I had to take antimalarial drugs because of the threat of mosquitos.” (Hored)

“Actually, if I had sickness in my body, I normally feel it, then I rush to the doctor, then I will explain to the doctor what I am feeling, and he helps. And then the doctor prescribes the medicine for me based on my explanation. Also, we use traditional medicine and at times it works. We sometime contact the traditional medicine providers in the absence of modern drugs. Sometimes we may be lucky.” (Sumuon)

4.2.3 Other Health Information Needs

4.2.3.1 Information Needs about Other Diseases

The findings of the study further identified other types of health information needed in addition to that about the tsetse fly and mosquitos. Some of the sicknesses included kidney problems, diabetes, hypertension, typhoid fever, ulcers, miscarriage, high fever, biting flies, bacterial and fungal infections, cancer, and issues with menstruation. Livestock in the community suffered from other health issues including the sickness of Sefa, Zawo Na Jini Daudha (Local Hausa language; no equivalent in English), discharging stool, etc. The information needs of the communities went further, including how to address the low milk production commonly found among their cattle. They attributed this to various diseases, including trypanosomiasis affecting their animals, which lacked a healthy pastoral grazing area. Part of the coding categories that

emerged in the process of the Nvivo software analysis further revealed that the communities needed drugs that could be used to alleviate the suffering of their sick people and animals.

“ . . . a lot of diseases which includes malaria, typhoid and lack of good water to protect our health. Also, we have an issue related to mosquitos that affects our animals and causes us a lot of high fever.” (Witara)

“ . . . sicknesses including more of malaria and typhoid and its causes. According to my knowledge, typhoid is acquired through unclean water.” (Summon)

‘Most of our sickness includes typhoid fever, malaria, and asthma on many of them.’ (Soven)

Furthermore, women in the focus group discussions stated that they had a problem with vaginal infections or fungal infections, as remarked upon by the following participants:

“We know and confirmed there are records of diseases of fungal infection.” (Wure).

“There are some vaginal infections affecting the women. They discharged a white liquid watery substance from their privates.” (Quizol)

“Based on the responses from females you interviewed, we agree not only 6 out of 10 females are infected but even 7 or 8 out of 10 are infected with fungal diseases.” (Lode)

“We have recorded the highest rate of fungal infection among all girls and women in our community, I am positive that all of us here (in the focus group session), if tested, we will prove positive the presence of the disease.” (Biok)

“We have cases of cancer, also cases of hepatitis and of malaria.” (Yose)

“This is more related to human health. Mostly it involves diseases like high blood pressure or diabetes.” (Puloyl)

The above statements from the research participants indicated the community was suffering with various diseases, as seen in Table 9, and there was no immediate and reliable health information resource or infrastructure to address these issues. This confirmed that the well-being of the residents was in great danger.

4.2.3.2 Information Needs about Other Sicknesses/Diseases

In addition to the tsetse fly and mosquito-related health problems discussed above, the study found the community was affected with other diseases and sicknesses, making their living conditions very difficult. The community was interested in knowing more information about diseases other than those caused by the tsetse fly and the mosquito. The most common issues among these included high fever, mental illness, high blood pressure, and ulcers.

“I need to know some issues about my health because I get sick all the time.” (Umoy)

“I look for health information because I consider my wellbeing an asset toward my daily activities and the productivity of my life.” (Turone)

“I look for health information from time to time.” (Bule)

“The cases of kidney problems for both human and animal. We also confirm cases of ulcers, diabetes, high blood pressure. We have fewer cases of paralyses. I need more information about those sicknesses.” (Soven)

“We need information on various sicknesses we have. There is a lot of death of young children aged 1-5 and miscarriages.” (Tide)

“I need information about sicknesses that affect our community, including cholera, typhoid, asthma.” (Osleb)

4.2.3.3 Information Needs about Treatment and Prevention

The communities were discovered also to be in need of various ways to treat their sicknesses, as well as learning about different approaches to preventing future occurrences. Residents applied both traditional and modern methods. The study indicated that in many instances, the rural communities found ways to prevent further problems as result of the sicknesses they had to avoid the spread of disease.

Table 11 Summary of the Diseases and Sicknesses Reported in the Study

Disease or Symptom or Sickness	Major Cause	Categories Affected
“Adding Water”-communities Frequent being put on drip in clinic houses	Suspected to be a result of mosquitos	All categories of people
Asthma	Dust	Adult men
Bakon Dauro (Hausa language)	Not known	Children
Bokkare Fever (Fulfulde language)	Insect	All categories of people/Animals
Boru (Fulfulde language)	Insect	Animals
Blood Transfusion	Likely malaria	All categories of people
Cancer	Not known	Adult Men
Cholera	Slump environment	Children and women
Diabetes	Not known	Adult men
Discharge of Liquid Saliva	Tsetse fly	Animals
Dysentery	Not Known	Children
Eating Plastic	Tsetse fly	Animals
Elephantiasis	Tsetse fly	Men
Feet Worn Out	Tsetse fly	Animals
Severe Headache	Malaria or tsetse fly	All categories of people
Haboje (Fulfulde language)	Mosquito	All categories of people
Hepatitis	Not known	Men and women
High Blood Pressure	Not Known	Men and women

High Fever	Likely malaria	All categories of people
Hypertension	Not known	All categories of people
Kidney Problem	Not known	Men
Kirchi (Hausa language)	Tick	Humans and Animals
Lallili (Fulfulde language)	Insect	Human and Animals
Lodi (Fulfulde language)	Insect	Human and Animals
Loss of Pregnancy	Fungal infection	Women
Loss of Sexual Interest Among Couples	Not known	Men and Women
Loss of Water in Human Body	Likely high fever	All categories of people
Miscarriage	Not known	Married Women
Mubai (Fulfulde language)	Insect	Humans and Animals
Mukko (Fulfulde language)	Insect	Humans and Animals
Malaria	Mosquito	All categories of people
Menstruation Delay	Fungal infection	Women
Paralysis	Not known	Men
Polio	Not known	Children
Severe Pain in Lower Part of Stomach	Not known	Women
Samore (Fulfulde language)	Tsetse fly	All categories of people
Sefa Hausa/Fulfulde language)	Not known	Animals
Sickler	Not known	Children
Sleeping Sickness	Tsetse fly	All categories of people

Stomach Pain	Likely Typhoid	All categories of people
Swollen Mouth	Not known	Animals
Tarin Fuka (Hausa language)	Not known	Old male adults
Tarin Lala (Hausa language)	Not known	Children
Tick	Not know	Livestock rearers
Trypanosomiasis	Tsetse fly	Humans and Animals
Typhoid	Lack of clean water	All categories of people
Ulcer	Not known	Male youth
Vaginal Infection	Not known	All Females
Vomiting Blood: Mouth and Nose	Not known	Young children
Watery and Itching Eyes	Not known	Animals
Weight Loss	Not known	Men
Zawo (Hausa language)	Not known	Animals

4.2.4.1 Social Health Infrastructure Information Needs

Similarly, the communities were found to have general information needs related to social infrastructure in their area. These included the availability of medical personnel, hospitals, and clinics for both humans and animals. Their information needs also included Internet services and resources even though there were obstacles associated with connectivity. The community, according to the study, was keen on using the Internet to browse for information related to their health information seeking. The presence of a computer literacy lab in the area, established by a nonprofit organization called Millennium Development Goal (MDG), had encouraged the

residents, especially the youth, to apply technology to their information searches. The study also confirmed that a handful of the residents had the technical know-how to conduct information searches on the Internet.

4.2.4.2 Summary

In summary, this section discussed the information needs of the study participants. It may be noted that the responses provided a clear picture of the participants' perceptions about health information needs in the rural area where they live.

4.3 RQ 2 A. What Factors Influence, or Trigger, Rural Residents' Health Information Needs in the Kachia Grazing Reserve, Nigeria?

B. How Do These Factors Impact the Ways Rural Residents Seek and Search for Health Information?

4.3.1 Factors Influencing Information-seeking

This section reports on the factors the study discovered that influence the local residents of the Ladugga Grazing Reserve in their information needs and their seeking and searching behaviors. The section highlights 11 factors found to influence the community's information seeking. These are: specific health issues, uncertain health information, personal well-being, lack of social health infrastructure, prevention, keeping updated on recent happenings, emerging diseases, quality of life, and causes of death. These are discussed in turn:

4.3.2 Specific Health Issues

The study noted that residents' current health issues dictated the kind of information needed and what types of information-seeking activities the residents pursued. In the health information-seeking context, individuals engaged in a variety of information-seeking tasks that depended on

the situation in which they were involved. For example, in the study, residents frequently sought information regarding all categories of their health concerns or that of their animals. Therefore, the state of health or sickness of a person or caregiver triggered residents to engage in information-seeking in order to overcome their health problems. This included sleeping sickness caused by tsetse fly infection, which resulted in the disease of trypanosomiasis in both humans and animals. Other sicknesses included elephantiasis, malaria caused by mosquitos, and other diseases such as typhoid fever, ulcer, diabetes, kidney infection, high blood pressure, paralysis, mental illness, cancer, fungal infections, and vaginal infections. Despite the prevalence of these diseases, the community had no information to address their occurrence or treatment.

4.3.3 Uncertain Diseases

The study revealed that the vagueness of the community related to emerging and unknown diseases and sicknesses in their community had greatly influenced them in active health information seeking. These factors were found to be a significant reason for the community to engage in health information-seeking as a way to address the health concerns of what they did not know, or they could not tackle.

“I’ve lived in this community for almost 20 years. I have seen different kinds of sickness in people and we don’t know what it is.” (Clowel)

4.3.4 Personal Well-Being

Personal health information (PHI) is a more precise description of the patients and their health educational awareness of information-seeking activities, commonly known as consumer health information. Based on this information, consumers were influenced by personal factors of the problem they had. Therefore, research question 4, discussed below, was able to identify the

primary reason communities looked for health information. The fundamental reason was tied to the current situation they found themselves in. The responses of different participants, across all the data collection methods, indicated they engaged in the process of information-seeking for disease prevention. They further stated the notion of protecting themselves and their families from the harmful effects of the diseases caused was confirmed in one of the questionnaire responses by a male participant:

“I need information related to how to protect my household from the effects of malaria disease.”
(Coop)

Also, another respondent stated that:

“The main reason for health information-seeking is to protect me from all this disease.” (Awole)

The study revealed that the health problems in the community needed immediate solutions, which made them engage in health information seeking. Another factor that influenced participants in information-seeking was the deteriorating health conditions of the communities, which necessitated that residents look for information. This was confirmed by Edowel, a male participant, in his response to the questionnaire:

“What motivated me to look for health information? Because I personally felt sick” (Edowel)

Another participant disclosed:

“My information-seeking is related to knowing why the doctor says people always need more blood when they go to the hospital.” (Sole)

Also, in the study, the communities were found to suffer so many deaths of their young as a result of malaria, as reported by female participant in the focus group:

“Yesterday I could not sleep because of the high fever. This also affected my children. Also, recently my younger brothers, called Babu and Ali, died by the incidents of mosquitos. As result, this made me realize that this malaria issue is a serious disease.” (Seen)

4.3.5 Lack of Social Health Infrastructure

Another important issue discovered in the study was the lack of health infrastructure to address the community members' health problems. As discussed earlier, the rate at which members of the communities contracted various diseases necessitated them finding immediate health care facilities. The community members looked for appropriate health facilities, such as a hospital, clinic, or medical practitioner, for both humans and animals.

“Lack of access to electricity, good roads, and hospitals are a great problem. Having these will really help us to alleviate our problems with our health information-seeking processes.” (Looly)

“There are no available government health facilities that will help ease this problem.” (Qulock)

“We don't have appropriate measures to tackle the problem and lack sufficient medical advice.” (Pusoleb)

“Poor roads, hospitals, internet, school, education, etc.” (Clowel)

4.3.6 Prevention

Furthermore, according to the study, the pressing issue of prevention—how the residents wished to safeguard themselves from health problems—was among the basic things that influenced them to look for information. This was indicated by Deely, who confirmed the reason that influenced her to look for information was *“to protect my community and my family.”* Wole responded similarly in the questionnaire by indicating *“I need so much information related to mosquitos because I need to protect myself from the harmful effect they cause.”* Similarly, Clowel indicated in an interview response *“how to protect myself and my family,”* as did Bube in the focus group discussion: *“. . . serve as a bridge between the community and the agency to address some of our questions.”*

4.3.7 To Keep Updated on Recent Happenings

Another interesting finding about what motivated the communities in health information-seeking related to their curiosity about knowing about new scientific discoveries and progress with respect to the health care system. Some members of the communities, especially the youth interviewed in the study, confirmed that they had taken extra steps to learn about emerging diseases, in particular their effects and their solutions. These include the changing process of malaria treatment or resistance to drugs, as described by a participant in an interview session:

“If I have malaria symptoms, I feel weakness and my body develops high fever. As a result, I go to a local chemist (pharmacy) to get the drugs. I will ask the attendant for malaria [medicine], it come in a sachet of 3 tablets, which I will use. If it doesn’t work, I will repeat again. I will keep trying. God willing, I will feel good. After a week the fever returns again, I will continue to repeat the same process as I did earlier since I don’t have another option.” (Soven)

This caused them to take another search step to look for further information regarding their health condition. For example, another participant indicated:

“If the symptoms persist, I go to the hospital or clinic we have around here. There was a time recently when I had to travel to Kaduna for proper medication in the Barau Dikko hospital. They referred me to another hospital called the 44 Army Reference hospital, where I underwent various lab tests. This took so long to get the results. I later decided to go to the private clinic called IMA Clinic. They asked me to undergo ultrasound and other tests where I got the result within a short time and they prescribed me the required medication.”(Gooles)

4.3.8 Emerging Diseases

The study also revealed there were some emerging, unidentified diseases that affected the community. These include bacterial infections commonly found among female residents, as described by a female participant in the focus group discussion:

“We have a record high rate of infection among all girls and women. I am positive if all of us here in the discussion are tested, it will prove we will have the disease.” (Seen)

“Other diseases related to vaginal infection that are spread all around the people in the communities” (Deely)

“The female discharge is a thick white color and then it turns to be like mucus and it itches, and as result some rashes comes out on the private part of women and create inability for women to conceive.” (Tide)

“[there are] cases of kidney [disease], hepatitis, asthma. Almost every person has asthma in this community.” (Muntade)

The respondents confirmed those diseases were not common in their area before but, now they suffer the sickness. The toughest part of the problem is that the residents are yet to have a cure for this disease. One of the respondents reported attempting many trials to use a modern system of medication to cure the vaginal infection but to no avail.

“We only have some immediate medication from the clinic we have. They give us some medication which we insert in our private parts, yet it does not eradicate the disease but only lessens or relieves the pain. For example, I try to use another set of medicine for which I spent the sum #5000 naira (about \$15) on each injection five times, totaling 25,000 (\$55 dollar), yet I am still suffering the problem.” (Lode).

4.3.9 Quality of Life

The study also revealed another reason why the communities engaged in health information seeking: to have good and healthy living conditions. Most of the respondents showed their concern for the wellbeing of their families and how they would want to prevent disease so as not to create distress in their lives.

“As I said earlier, I am more interested in finding information about how the fly bites and what it causes to human and animals, and the prevention measures that may be taken to avoid the disease.” (Sole)

“I look for information related to how the flies look. How I can protect myself if I don’t know how it starts? I need this information.” (Cusy)

“I look for health information because I consider my wellbeing to be an asset toward my daily activities and the productivity of my life.” (Turone)

4.3.10 Causes of Death

The study reported the causes of death in the community as result of widespread malaria sickness involved both genders, mostly children. Also, hundreds of thousands of animals reportedly died as result of tsetse fly infection. This created fear among the residents and motivated them to find lasting solutions to the problem. This situation made them look for any available information and assistance so as to stay healthy. As one of the respondents stated,

“As result of this (disease) we have a record of about 20 deaths this year among our children.” (Lora)

“There are a lot of deaths of young children ages 1-5, and miscarriage.” (Clowel)

4.3.11 Summary

The section outlined key ideas that help to understand what motivates the health information-seeking and search behaviors of members of rural communities. There was considerable variation in what influences the health information-seeking processes. Nevertheless, the responses further illustrate the main factors that influence the participants in their health information-seeking processes.

4.4 RQ 3, What are the Health-Seeking and -Searching Behaviors of Rural Residents of the Kachia Grazing Reserve Nigeria Affected by Vector-Borne Diseases (Transmitted By Mosquito and Tsetse Fly)?

4.4.1 Information-Searching Behavior

As discussed in the previous section, the residents displayed their desperate need for information associated with the issues affecting them. For this reason, as confirmed by Taylor,

information-seeking is popularly recognized and initiated by information need (Taylor, 1968), which justified their seeking and searching process. This is similar to ideas posed by Belkin (1980), Dervin (1983), and Kuhlthau (1991), that when a patient recognizes that he or she has an Anomalous State of Knowledge (Belkin, 1980) or gap in knowledge (Dervin, 1983) and uncertainty results (Kuhlthau, 1991), such recognition might influence the information-seeking of particular users depending upon what is sought and the context of the search (Kim, 2015; Lorence et al., 2006).

In addition, (Bates, 1979) stated that searches are categorized by search strategies and search tactics, tactics referring to an immediate choice or action taken, and strategies being a combination of tactics. Therefore, health information-seeking is associated with a wide variety of factors of searching behavior and thus is dependent upon the type of information needed, the reason for the search process, and the experience level of users (Lorence et al., 2006). Built on this, the study revealed disparities in the approach community members used in their information-seeking and -searching behavior. These included the following activities: traditional techniques, modern techniques, mobile technology approaches, interpersonal communication, observation, and investigating personal health issues.

4.4.2 Traditional Techniques

Cultural factors are the recognized beliefs, values, traditions, laws, and language of a nation or society. Cultural factors are systems of thoughts and integrated patterns of belief and behavior of a particular people according to their background (Armenakis & Kiefer, 2007). Komlodi and Carlin (2004) indicated there is theoretical evidence that shows culture affects information seeking. They further identified key findings related to culture, stating that an individual's ability to process

information related to cultural background had an impact on information-seeking behavior. The researcher observed that cultural beliefs play a great role in influencing their information-seeking and -searching behavior so as to conform with those variables. For example, the community used traditional medicine or prayers on a large scale to cure the sickness affecting them and their animals. Their belief was strongly connected to their cultural and religious way of life in terms of the way the community used to be. There were some groups who applied the use of charms and superstition as a way of curing patients.

“Actually, if I had sickness in my body, I normally feel it then I rush to the doctor, then I explain to the doctor what I am feeling, and he helps. And then the doctor prescribes the medicine for me based on my explanation. Also, we use tradition medicine and at times it works. We sometimes contact the traditional medicine providers in the absence of modern drugs. Sometimes we may be lucky.” (Sumuon)

“We rely on trials. We tried different kinds of traditional medicines. We try different herbs according to the recommendation and advice given by the traditional medicine sellers. We don’t have options sometimes. We may be lucky or the other way around.” (Osleb)

4.4.3 Modern Approaches

The community was also found to use of a modern system of information-seeking that included the use of a hospital and clinic available to them, or the use of medical practitioners. The residents of the community traveled to the nearby city, where the health infrastructure was established, to ask questions related to their health concerns, for example visiting the hospital where modern drugs were used, the application of Internet information seeking, and the use of the WhatsApp social media platform. The study also found that most of the residents had a standard high school education, which greatly influenced them to use a modern approach in their health information searching. The availability of a drugstore, popularly called a “chemist,” was a good example confirming that the community relied on modern approaches for their health treatment.

“We have various options for modern medicine that can cure us and our animals. We depend so much on modern medicine from the hospital even though we don’t have it all the time.” (Quizol)

*“We don’t have any earlier techniques or information to identify the tsetse fly until the medical practitioners came to check and offered us suggestions for modern drugs to buy in the city.”
(Witara)*

4.4.4 Mobile Technology Approaches

The presence of some mobile network signals in the area facilitated the communication process of the residents using mobile phones. The carriers included the GLO, Airtel, and Etisalat networks. The study confirmed that the effectiveness of these networks was poor as a result of low signal reception in the area.

“We climbed to the top of the water tank to look for good reception for our mobile phone internet signal. The GLO (Local Nigerian mobile service provider) network has stronger reception.” (Soni)

The main mobile network signal came from the neighboring big town, Kachia, and the signal was purposely not meant to serve the community. Despite that, the community members partially communicated among themselves. A local antenna was created by one of the youths in the community and it was tested, which facilitated empowering a weaker signal into one strong enough to enable effective communication. This situation helped the researcher discover that some of the residents used mobile the communication system in information-seeking and searching even with limited Internet connectivity. Only a handful of residents engaged in this process, but their response contributed greatly to understanding other processes the community used in information seeking.

“I try to get a modem (device used to boost the signal). I sent some people my personal money on several occasions but ended up with no response to get the modem. I lost so much money trying to acquire the modem even though I am not sure it will work here.” (Gooles)

“We invented a local area [network] to boost our signal for better reception.” (Mutade)

Furthermore, in a related development, some of the respondents’ interviews clearly demonstrated the literacy of computer usage, especially the use of the Internet, in the school they attended in the city. The study confirmed that the residents used their smart phone mobile Internet service to browse the websites of Google, Facebook, and Opera.

“The main problems we have include the lack of a good road network and good signal reception for our mobile phones to enable browsing the internet, to go into Facebook and get information through other websites.” (Looly)

“There are so many youths that are educated with a secondary certificate NCE diploma. They are more interested in information especially internet search.” (Soni)

“There are people who enrolled in the degree program in an open university with a more online base, they need to have access to internet, but they have to go to Kachia for a better connection.” (Deely)

“More importantly, our major concern is more related to mobile phone network service, which is so poor. People had to move around to get good reception to communicate.” (Qulock)

“We browse but with delay. If we had internet [access] the rate of our information-seeking will be greater.” (Soni)

“More than 15000 people will be engaged in Internet information-seeking if is available.” (Soni)



Figure 19 A community mobile support communication system.

4.4.5 Interpersonal Communication

Interpersonal communication was another way the community engaged in health information-searching activities. This process had existed in the community for a long time, especially in a situation where the means of modern mobile communication was absent. Traditionally the residents were found interacting, sharing ideas, and exchanging questions about the issues that affected their way of life, especially related to their health and well-being. The study

revealed that participants communicated with each other through consultations and questions about various issues of concern.

The first stage of interpersonal communication starts when a person in the community engages in information seeking; the search begins by the information seeker asking informal questions to any person close to him or her. The query asked will be transmitted through various channels among people in search of the answer. This process keeps going until a required answer is received as a form of feedback, which will be communicated back to the person who initiated the question. This process at times takes shorter or longer depending on how the information is conveyed among the residents and the availability of a person who knows the answer.

Furthermore, the information query posed can travel for a long distance to other villages or communities, and the feedback may come in multiple ways or produce different opinions from the subjects asked. This searching process has not been generally accepted, since the feedback answer comes in multiple options, and the information seeker would not know what to choose. Despite the shortcomings of this information-seeking process, the residents used it most frequently in their health information-seeking efforts.

4.4.6 Observational Method

Another traditional form of information-seeking and searching behavior that the community engaged in was the observational approach. The community engaged in preserving and using the practical life experiences of some critical issues affecting the well-being of their community, especially their health.

“The only immediate solution we have is based on practical observation. If we realized one of our animals has a problem or is slow in eating the grass or we observe something weird, we rush to give them medicine related to either the eating of plastic bags or issue with their kidneys, we administer drugs or make an injection. We are forced to be self-medical personnel by trial and

error. We were able to know the kind of drugs they need and what injections they required.”
(Pusoleb)

“Observation of how others survive helps. We apply the experience to ourselves and our animals. Sometimes it works, sometimes not. It is more of a trial since we don’t have options.”
(Quzol)

“Normally, for example, if we see our animal is misbehaving, this is considered the sign of sickness. We typically rush to look for medical personnel to come and give us immediate help. This also applies, too, if someone is sick. We take him to the hospital or clinic nearby for proper medical attention. (Wure)

This confirmed what they observed earlier as a result of previous experiences with their own health concerns and for the livestock they possess. For example, the study found that the community learned from past experience regarding the illness of either a human or an animal in certain ways and used it as a preventive measure for future occurrences, as one of the respondents in an interview stated:

“Since we don’t have any alternatives we learn from our mistakes and test different approaches to overcome the mysteries of this sickness.” (Clowel)

“I used my last experience of the difficult situation I found myself to protect my family” (Looly)

Another thing the study found related to observation is the ideas, techniques, or measures used by the community applied to certain diseases or sicknesses. The success of those trials was shared among the people in the community to use if a similar disease or sickness occurred in any person in the community. The observation process they used and tested temporarily helped to overcome some sicknesses before they got out of hand.

4.4.7 Self-help seeking behavior

Personal health information (PHI) is a more precise description of the patient and his or her health education awareness, commonly known as consumer health information (Stavri, 2001). The study revealed that the participants' searching process was based on the situation they found themselves in currently. The communities suffered from the problems arising from mosquitos and tsetse flies, which caused diseases for both humans and animals. The community members in this study were found to engage in self-help-seeking behavior, meaning they devised means and strategies to overcome their difficulties, including immediate precaution against disease. For example, they applied medicinal ointment to the lower part of their animals to reduce the excessive bites by the tsetse fly and mosquito.

“Yesterday I could not sleep because of the high fever. This also affects our children. Also, of recent, my younger brother called Babu and Ali they were killed by the incident of mosquito, as a result of this made me confirm that this malaria issue is a serious disease” (seen).

4.4.8 Sources of Information

With regard to the community's health information sources, the findings reported various sources the resident used for their health information needs and searching behavior. The study found that communities' general sources of information varied according to the situation and how much information was accessible to them. The findings categorize their general information source into frequently, lesser, and rarely used sources.

The frequently used sources were the major sources the communities relied on most frequently in their everyday information needs, while the lesser used sources represented the next alternative for information if the frequently used source was unavailable; the lesser used source

needed a little searching to access it. The rarely used sources were those the community used that were not always accessible; these sources took a long time to access, which was difficult because of inadequate infrastructure.

4.4.8.1 Frequently Used Sources

The study revealed some emerging categories that were frequently stated among the participants in all three data collection methods (questionnaire, interview, focus group). The communities used interpersonal communication sources among themselves in information seeking. These were comprised of the exchange of health information among families, friends, and relatives when the need arose. As a respondent in the focus group interview remarked:

“We got information through community interpersonal communication processes.”(Ardo)

This signifies that the community members relied upon each other for information to address their health information needs. Furthermore, the study confirmed that some of the participants recognized practical experience as the source of information based on trial and error. The study further discovered that the residents actively relied on and used the traditional medicine seller, called *Boka* in the Hausa language, as the source of their health information. The residents had the highest trust for what the traditional medicine seller gave, either in the form of consultation advice or drugs to use for animals or among themselves.

Another source of information that was frequently used by the community was a one-way information source. This was a situation whereby they received information without a chance for feedback in the form of questions or asking for further explanation of the information they received. The residents also engaged in the use of local and international radio stations available within their area. The study confirmed that they listened to local radio stations in Medium

Wavelength (MW) such Radio Nigerian Kaduna (FRCN), Nagarta radio, a private station, and two international radio stations, the British Broadcasting Cooperation BBC and Voice of America, broadcasting their program in Short Wavelength (SW) in the Hausa language three hours a day. The residents further confirmed that those radio stations broadcast some health programs on a weekly basis.

Another source of information the community used frequently was their traditional leaders, called “ardo” or “hakimi,” as well as the religious leader. Even though, as the research reported, there was reduced availability of health professionals and clinics in the area, still the communities actively used a local doctor had a small clinic in the main central area of the grazing reserve. They also used the local paraprofessional health officer the government sent to the village as a source of information.

4.4.8.2 Lesser Used Sources

The alternative sources of information the study found that communities relied on were the lesser used sources, which were only partially accessible to the community. These included sources such as the local hospital, located in the nearest urban area to the grazing reserve. As reported by one of the participants, they had to travel to a hospital located in Kachia, Kaduna, and Jos to look for health information about their own or their family’s concerns. Other sources of information reported in this category were the use of medical personal and hospital staff residents met or communicated with using a mobile phone. They were also found to inquire about their health problems with health personnel within the local and state government council that was located closer to their communities.

The problem with this approach was that the community could not validate the qualifications of the medical personnel they were relying on for their health questions. They also used the social media platform called WhatsApp as a source of information. This application was recognized and accepted by numerous residents as a forum for information exchange. It only required limited data to enable the exchange information, that is, a smart mobile phone.

“I was able browse the website and find out some of the medicines we used are already obsolete based on recommendations from American and Western countries.” (Soni)

4.4.8.3 Rarely Used Sources

These sources, as reported in the study, were not frequently accessible or used by the communities in their health information seeking. Numerous participants reported they accessed health information as a result of Internet browsing using a local smart mobile phone with the network service provider Etisalat and Glo. However, the dependability of this source was minimal. The participants searched for Internet information on their phone on average twice a month or less. The duration of the search was not more than 15 minutes, due to the problem of poor connectivity.

An additional source of information discovered under this category was having access to information through teams of researchers visiting their area to conduct studies on the tsetse fly. The community used these opportunities to ask their health questions. This process, according to most of the participants, enabled them to gain additional knowledge about their problems or learn some techniques to overcome their health issues. As one of the male respondents reacted while answering his questionnaire:

“We found information about the tsetse fly through some groups of researchers who visited our community for research related to flies, and this gave us a chance to ask a question.” (Coop)

4.4.9 Summary

On a similar note, the residents had good coordination with the research staff of Nigerian Institute for Trypanosomiasis Research NITR based in Kaduna who visited their communities intermittently to conduct research on trypanosomiasis. Residents used this forum to ask questions related to their health information problems. Additionally, the communities confirmed that they got some of their health information through international research teams that visited their communities, mainly from Europe and the United States. They also received information from veterinary staff that occasionally visited.

The section provided key ideas that help to understand what motivates members of rural communities' health information-seeking and search behaviors. There was considerable variation in what influences the health information-seeking processes. Nevertheless, the responses further illustrate the main factors that influence the participants in their health information seeking processes. The section further demonstrated the multiple ways and patterns rural community members followed to access health information. More importantly, the responses identified the clear pattern they use in information behavior and identified the most and least frequent sources of information they used.

4.5 RQ 4 What are the Barriers Rural Residents Encounter in Addressing their Health Information Needs, Seeking and Searching-Behavior?

4.5.1 Diseases/Sickness

The study discovered that information is a vital tool that the community members used to make decisions about their problems. The communities had several problems that affected them in terms of having reliable information that would assist in resolving their difficulties. One of the

major problems was the presence of various diseases in the area. The communities suffered different kinds of sicknesses that affect them and their animals. Some of the diseases identified included the tsetse fly infection, which resulted in the disease of trypanosomiasis in both humans and animals. Examples of diseases were sleeping sickness, elephantiasis, malaria, typhoid fever, ulcers, diabetes, kidney infection, high blood pressure, paralysis, mental illness, cancer, fungal infection, and vaginal infections. The communities had no information to address the occurrence or treatment of these diseases.

“We have cases of typhoid, malaria and kidney disease, and also confirmed typhoid occurred as result of the unclean water we drink.” (Yosemer)

“Children have high fever and is caused by mosquitos.” (Soni)

“Other diseases related to vaginal infection that is spread all around the people in the communities” (Seen)

“I have severe pain in the lower part of my stomach.” (Tide)

“I found out that of every 10 females, I assure you 6 have this disease. Even my daughter, I confirm she is infected.” (Lora)

“The cases of kidney [disease] for both humans and animals, we also confirm cases of ulcers, diabetes, high blood pressure. We have fewer cases of paralysis.” (Ardo)

“The illness of high fever [caused by] mosquitos, and you will see our children shaking and feeling cold because of the symptoms of the fever, headache and typhoid fever.” (Floore)

4.5.2 Social Infrastructure

Lack of social infrastructure was among the things the study revealed as a major obstacle to information-seeking and searching among the communities. The study found the communities did not have hygienic drinking water; most of the residents drank water from the same stream as their animals. There were a few exceptions in the main Ladugga town, where some NGOs had

built a solar borehole, but this only served a small percentage of the population of the grazing reserve.

Furthermore, the community lacked good roads, which are considered vital for an effective transport system, especially to enable medical personal or any other group willing to assist to come to the community. Another problem associated with infrastructure was the poor drainage system of the main Ladduga town, which resulted in flooding during the rainy season. The roads were dusty, which could lead to severe sickness for residents and visitors as the result of dust blowing in the dry season, as can be seen in Figure 14.

“ . . . lack of clean water. We only have a few boreholes constructed. The majority of the population in the community are drinking and using the water from the same stream as their animals. Very few have a constructed well.” (Ardo)

“We don't have the government hospital that will treat malaria, typhoid, ulcers.” (Wure)

“We have problems with the road network, hospitals, medical personnel and schools for our children.” (Bolock)

*“There is no availability of government health facilities that will help alleviate this problem.”
(Qulock)*

“The issue of human health, especially related to pregnant women, especially when it comes to delivery, there are so many issues attached for which we lack infrastructure that can handle their safety.” (Quizol)

Another problem was lack of medical facilities, which included the standard clinic or hospital for both humans and animals. The only available clinic, in the main Ladugga town, was owned by a private doctor. The other small clinics, established by the government, were in deplorable condition. This also extended to a lack of qualified medical personal to serve the large number of people residing in the communities. The presence of a privately-owned local clinic

offered little help in solving the emerging issues associated with the health condition of the community.

4.5.3 Ecological Problems

One factor that can impact a search for health information is the location where the search is carried out. In fact, it is interesting that often the context and specific search environment become deeply linked in search studies. Environment includes the physical location as well as the people, things, and natural elements occurring in and around that place, while context is more the broad search category, such as “medical practices” or the “university setting.” The environment can impact the information need as well as the way the information is sought in a variety of ways. For example, the physical and situational contexts are recognized to be influential factors in information-seeking behavior, but they do not operate in a vacuum. While the environment is important, it can impact users in different ways, so the impact of other factors, such as personal characteristics, the individual search task, the features of the information system, and so on, still play a role, even if the environment was deemed perfect

The environment was another problem for the community in terms of animal productivity. The grazing reserve was established in order that cattle raisers could feed their animals for agricultural production. However, the reserve turned into a death zone because of various diseases caused, primarily, by the tsetse fly and/or mosquito. Most of the communities complained that the environment is no longer pastoral, as the grass for feeding their livestock was diminishing.

The study uncovered that the grazing reserve grassland was continuing to decline and eventually would not feed the larger population of animals housed there. As a result, the livestock owners moved around to pastoral habitat grazing areas further south for greener pastures.

Furthermore, the environment contained insects other than the tsetse fly and mosquito, which highly affected communities such as Mucco, Lodi, and Boru.

“The nature of our place, even though it is a thick forest, we don’t have so much grass because it’s shady. This does not allow more grass to grow based on our assumption.” (Wure)

“We have a problem with [the lack of] good, roads, lack of hospitals, lack of medical practitioners, lack of teachers, lack of electricity.” (Sukko)

“For example, somebody who has 100 head of cattle may now end up with either 20 or 30 or 50. At the initial stage you may find the animal suffers a swollen ear and watery eyes. This indicates the initial stage of symptoms.” (Mutade)

4.5.4 Reliable Information Sources

Other problems discovered were the lack of authentic and reliable sources of information the community needed related to their health information seeking. Most of the sources were described as not enough or ineffective to address their problems. Even though the community might have used various sources, the authenticity or reliability were questionable. Most of the community members used any information that came to them, since they did not have an option, coupled with essential knowledge, to investigate what information they received. As Bick stated in an interview:

“I don’t know how to judge good or bad health information that comes to me, I just use it since I don’t have an option. Sometimes I will be lucky or fall into problems.” (Bick)

“My thinking is either related to mosquitos. I’m guessing it’s mosquitos because I don’t have the knowledge, I don’t have any information related to them.” (Osleb)

Yet the study was able to note that some participants claimed they could assess good information. As Awole said, *“I only depend on the good information”* (Awole), but when asked how he judged the goodness of the information, he could not answer. Also, the same applied to

Bule, who reported that *“I used to follow the authentic source in finding information related to mosquito-based diseases”* and *“I consider things are good when the information comes from someone who wears white clothes”* (i.e. referring to a lab coat or official biomedical clothes). His reason for choosing someone wearing a white coat proved to be dangerous, because a white clinical coat is not a license and does not provide authority for a person to prescribe drugs to humans or animals.

Contrary to his thought, the research discovered that the community suffered from a lot of fake biomedical professionals who offered them service in return for money. Residents could not distinguish between the qualified person and the fake person who visited their community.

In a related circumstance, the one-way flow of information was another problem identified by the study. Most of the community residents had access to one channel of communication, which was “receiving” without interchange for asking possible questions or receive additional explanation. An example of these sources included listening to a radio station that broadcast a program related to health. The main problem with this form of information is the lack of feedback or interaction; whatever was said was considered final, since it was a one-way channel of communication.

4.5.5 Educational Status of the Community

An important problem noted in the community that hampered the information-seeking process was the level of illiteracy. As shown in Table 7, the majority of the people lacked basic modern education, although a few residents had attended school. Furthermore, the study, as discussed earlier, found that the community lacked basic essential knowledge to even identify the health problems they were afflicted with. This type of ignorance has resulted in residents not

considering a modern system of disease treatment as important; rather, they still employed traditional methods.

"We need to address the problem of education related to health information, mainly through campaign awareness. We need more knowledge of how to take care of our health information and medical facilities. We do also need help in our educational system even though we have some but not as much required. However, we need a good school and teachers that will be more equipped to teach our community". (Nelson Shilding)

4.5.6 Duration of Information Access

Another problem that hindered community information-seeking and searching was the lack availability of basic information tools and sources that would facilitate the information-seeking process. This was described by the following participants:

"I cannot estimate the amount of time I spent looking for information, but it takes long." (Awole)

"It takes me so long to look for that information." (Dukole)

The process of information-seeking takes a long time due to a lack of reliable and assured sources that will allow them to easily find what they are looking for.

4.5.7 Lack of Access to Information

Another problem the study found was how difficult it was for the community to access information, especially related to their health conditions:

"The process of reaching other good sources is difficult. We only get a little information through our village head and traditional rulers." (Puloyl)

"We don't have sources of newspapers and TV because of economic affordability. The problem with this type of source of health information is considered a one-way source, even though we have mobile phones, but we don't have a contact (medical personnel) to ask." (Yose)

“The main problem we have includes a good road network and good signal reception for our mobile phones to enable browsing the internet, to go into Facebook and get information through other websites.” (Looly)

“So many youths that are educated with secondary certificate NCE diplomas will be more interested in information internet searching.” (Soni)

“There are people who are enrolled in a degree program in an open university which is more online-based. They need to have access to the internet, but they have to go to Kachia for better connectivity.” (Deely)

4.5.8 Socioeconomic Problems

Based on the economic standard of the community, which was described earlier, the standard level of living is poor, which was a major obstacle in information-seeking and searching behavior the community engaged in. This problem contributed to the lack of resources residents could use to facilitate their information seeking, for example, if someone in the community needed money to go to the hospital or to buy drugs or to subscribe a mobile Internet source to browse for any available information. The lack of basic infrastructure contributed to a low socioeconomic standard, which greatly discouraged people from using their money for health information seeking:

“It seems the government has forgotten us, in spite of demographic political representation where we have a significant number of votes.” (Osleb)

“We don’t have consistent health information resources and we don’t have money to facilitate getting it.” (Shilding)

“It is like we are in a cage. The health information is available. We cannot access it.” (Soni)

4.5.9 Summary

In terms of the research question asked, the section provided a summary of the participants’ responses toward the general obstacles they encountered in their health information-seeking processes.

4.6 Chapter Summary

In conclusion, this chapter highlighted the significant issues related to the research questions about what the community members did in their health information-seeking and information-searching behavior. The chapter discussed the types of general health information needed, including specifically information about the tsetse fly and mosquito. Some of the information needed included information about the tsetse fly- and mosquito-caused diseases, life cycle, treatment, and prevention.

The chapter also revealed the categories of diseases other than what the tsetse fly and mosquito caused, including typhoid, ulcers, hypertension diabetes, cancer, etc. Other findings revealed the need for social health infrastructure, for example, a clinic or a hospital. The responses to research question 2 also revealed various factors the communities found to influence them in their information-seeking and -searching behavior. These included specific health issues, uncertain health information, personal well-being, lack of social health infrastructure, prevention, keeping updated on recent happenings, emerging diseases, quality of life, and causes of death.

Similarly, the chapter also revealed the sources of health information the communities relied on, categorized into three sources. The most frequent source that the residents always found easy to access was their traditional titleholder, as they had direct contact with government personnel or agencies involved with the community; the titleholder typically used traditional medicine. Other sources included listening to radio programs, interpersonal communication exchanges, and the use of a local clinic established by a resident doctor. The community also relied on lesser sources in its information seeking. Examples included visiting the hospital in a nearby town and applying the use of the social media platform of WhatsApp for information exchange.

The other sources that were rarely used due to the difficulties in accessing them included having access to a research group and medical practitioners to ask questions, and Internet facilities.

The chapter concluded by elaborating on vital problems that were considered obstacles in the community information-seeking process. To mention a few: the presence of so many diseases in the community, lack social infrastructure, ecological problems, and a poor educational system. The next chapter discusses the findings of the study and develops a model based on the findings.

CHAPTER 5

Discussion

5.1 Introduction

This chapter provides a detailed discussion of the research findings presented in Chapter 4. The discussion explores the key issues the research questions centered on, including the community health information needs, the seeking and searching behaviors, the factors that influenced participants' information-seeking activities, the sources they relied on for information seeking, and the problems they faced while seeking information. Furthermore, the comprehensive model generated in Figure 22 below also will help to visualize the process of the rural community information needs and seeking and searching behavior. The research's theoretical, methodological, and practical implications also are discussed.

5.2. Research Questions

This section discusses the findings of each research question in more detail. These findings inform the grounded theory development in the subsequent section.

5.2.1 Health Information Needs (RQ 1)

Information need refers to a human's recognition of existing his or her knowledge that is inadequate to fulfill a certain need or achieve a certain goal. Therefore, information scientists must not only try to capture an individual's idea of a need for information (which may or may not yet be able to be articulated clearly) but be able to explore the moment when the person realizes that the information currently available in his or her mind is lacking.

The study identified different categories of information need displayed among the residents; this included information about the tsetse fly and mosquito, their life cycle, and the symptoms and the treatment of the diseases these insects cause. Previous studies in rural areas in Nigeria found a high frequency of occurrence of malaria (Abegunde et al., 2016; Babamale & Ugbomoiko, 2016). Previous studies also reported that most rural communities in Africa needed information about agricultural production, free areas for animal to graze in, lower calving rates, and low milk production.

Furthermore, the effect of disease in rural areas has been identified to be more severe during times when the control measures are neglected as result of the political instability African countries have experienced. (Brun et al., 2010; Swallow, 2000). The situation of lack of free grazing areas and low agricultural production affects the socioeconomic development of rural communities, especially in terms of health issues in humans. This is also in line with Taylor's (1981) proposition of three categories of information need including *physiological* needs, which refers to a natural need such as food, water, or shelter; *affective* needs, which refers to emotional needs; and *cognitive* needs, which arise in the attempt to learn a new topic or skill.

This assumption is similar to what Morgan (1958) proposed, namely that needs emerge from three kinds of motives: physiological motives (e.g., hunger and thirst), unlearned motives (including curiosity and sensory stimulation), and social motives (the desire for affiliation, approval, status, or aggression). The study also found that the community applied the three forms of information needs that Weigts proposed, including the way the community needed new information related to its health concerns, the need to elucidate the information held, and the need to confirm the information held (Weigts, 1993).

However, as established in the study, sickness attributed to the tsetse fly is one of the major health concerns of the residents; the analysis found that communities were motivated to look for health information about the fly's reproductive stages. In addition to that, the study also uncovered that the community needed information about the disease symptoms caused by the flies. In general, if the community recognized the cause of malaria was as the result of a mosquito, they still needed to know about other diseases caused by the fly. This result ties in with previous studies, where the majority of Fulani pastoralists showed low levels of bovine veterinary knowledge, with mostly incorrectly using veterinary drugs or procedures that were chosen for treatment or control (Majekodunmi, Dongkum, Idehen, Langs, & Welburn, 2018).

Similarly, the community displayed interest in knowing information about how to treat their diseases as well procedures for preventing sickness in their community. As presented in the previous chapter, the findings reported various circumstances, especially the community's information-seeking processes, in which they took different approaches to find information to treat their sick members. Some of the treatment information skills they applied included both modern and traditional forms.

These findings are consistent with what has been found in previous research conducted Atawodi et al.'s, (2002) study of indigenous knowledge systems for the treatment of trypanosomiasis in Kaduna state, Nigeria. That study established the indigenous knowledge application for treating sleeping sickness among 200 livestock farmers and traders around the state. The study discovered various plants used as treatment options (Atawodi et al., 2002). Other studies demonstrated the application of modern and traditional techniques (Atawodi et al., 2002; Etkin & Ross, 1982; Gibaud & Jaouen, 2010; Okeke & Okafor, 2008; Salako et al., 2001). Likewise, the

community pursued any relevant information that would enhance their protection against trypanosomiasis. They displayed the information-seeking need for the purpose of prevention of disease in their families. This result helped to interpret the missing gap of information need the community had, as explain by Dervin (1983).

On the other hand, the community exhibited similar information needs related to the mosquito as well as the tsetse fly. They looked for information about how the mosquito reproduced and its life cycle. For example, the participants showed more interest in knowing how the mosquito causes malaria, and how the mosquito regenerates, and what makes the mosquito's population grow.

This finding is directly in line with a study conducted in Enugu, Nigeria, about knowledge, attitudes, and practices for childhood malaria and treatment in urban and rural communities; that study revealed the need of communities to know more about the malaria disease (Oguonu, Okafor, & Obu, 2005). The current study cast new light on the need for information about mosquitos; the community was actively engaged in learning about the symptoms and the prevention measures. Even though malaria was identified uniformly as being caused by a mosquito bite, community members they still needed to know other characteristics of sicknesses that occurred as a result of a mosquito bite.

Furthermore, the community displayed the need to take advantage of any available therapy to treat the sickness caused by mosquitos. They used different strategies, including modern drugs prescribed by the doctor as well as traditional information sources of treatment. When comparing the results of this study with other older studies (Atawodi et al., 2002; Etkin & Ross, 1982; Gibaud & Jaouen, 2010; Okeke & Okafor, 2008; Salako et al., 2001), it is clear that there has been a

remarkable change in the way rural communities seek information to address their health problems.

A further novel finding of this study is the report of other health information needs distinct from the tsetse fly and mosquito. The study showed that the community was afflicted with various types of sicknesses as a result of different circumstances. For this reason, residents displayed information-seeking and -searching behavior to learn about the diseases that affected their community. Some of these sicknesses included asthma, cancer, cholera, diabetes, dysentery, headache, high blood pressure, pregnancy loss, weight loss, polio, typhoid, ulcers, and vaginal infections, as is clear in Table 9 above.

The information they needed was concerned mostly with how to address the problem of sickness. This outcome enhanced the findings of previous research that established that most rural dwellers showed the highest concern for health information that affected them directly. Examples include the study of Akinyanju of sickle cell disease in Nigeria and other studies that report diseases such as typhoid, malaria, and diabetes mellitus (Akinyanju, 1989; Maiyaki & Garbati, 2014; Sabir et al., 2013; Ugwu, Yiltok, Kidmas, & Opaluwa, 2005).

An unexpected discovery of the study was the misinterpretation of cancer, with superstitious belief about it being a demon's infliction. This assumption arose from insufficient health information; as a result, residents accepted whatever information came to them. Many studies have reported similar beliefs, such as what Ver Beek found: that spirituality and taboos constitute many of the traditional beliefs among Esan communities in Edo state, Nigeria (Ver Beek, 2000). Also, other studies noted the great influence of cultural health beliefs on residents' health conditions (Odebisi, 1989; Rinne, 2001).

The current study found the community's needs were consistent with Maslow's Hierarchy of Needs, which are categorized as basic needs, psychological needs, and self-fulfillment needs. Based on this theory, the community often observed that they needed to address the immediate problems of their health condition as the result of diseases, followed by other needs, which were assumed to be a second priority, such as the need for self-actualization. This analysis indicates that the information needs of rural residents are more linked to their health concerns; even though some general other information needs were reported, priority was given to the top of the pyramid, as proposed by Maslow's theory.

This also was confirmed by Weigt (1993), who stated that the form of information need occurs where a person needs new information related to their health concerns. In this study, the participants were reported to be looking for health information associated with the social infrastructure available in their area. These included the availability of a hospital or clinic, equipment for both humans and animals, standard schools, Internet service, and resources. These, according to them, were considered highly significant and important for the daily social activities of a rural community.

5.2.2 Factors that Influence Information-seeking (RQ 2)

Health information needs have been conceptualized as the reason that triggers individuals' active information-seeking behavior. Information-seeking behavior occurs from the recognition of some need perceived by the user (Wilson, 1981). Similarly, various user group studies in information-seeking show that each group exhibits different types of information-seeking behavior, style, and approach (Case, 2012). Pettigrew (2001), for example, defined information behavior as the study of how people need, seek, give, and use information in different contexts,

including the workplace and everyday living (Pettigrew et al., 2001). Wilson (2000) noted that the origin of human information-seeking behavior is found in work in information studies, more specifically in library and readership studies, which determine human seeking behavior.

The root of the problem of information-seeking behavior is the concept of information need, which has proved difficult to describe because so much of a person's information need is subjective; it is going on inside a user's head, and the researcher must capture a cognitive process, which can be complex (Wilson, 1997). The current study revealed many reasons that led the community studied to search for information. The contextual situation of poor health facilities proved to be a great factor in stimulating the community to engage in health information-seeking related to the diseases that were affecting them. This type of information needs and seeking were also associated with the type of disease residents have. Previous studies have confirmed that there are many different types of user groups. Information seekers include academics, engineers, medical personnel, consumer health patients, employees, students, and so on (Case, 2012). Each type of user has his or her own motivations for what prompted him or her to look for information (Ingwersen, 1992; Marchionini & Maurer, 1995).

However, factors have been found that influence the information-seeking behavior of a community member, including his or her characteristics, such as the demographics of the seeker; the search task itself; the features of the information system that the seeker uses; the information sources available to a given searcher; the type of search strategies available to the user, either because he or she has had training (or a lack of training) or because the system only works in a certain way; the user's knowledge of the domain (and the information system's ability to navigate

that same domain); the user's prior knowledge of the area (and the information system's ability to use prior searches to predict a user's needs); and so on.

Each of these groups exhibits different information-seeking approaches that are influenced by a variety of factors (Marchionini, 1989; Marchionini & Maurer, 1995). This study revealed that the participants' sicknesses encouraged them to look for specific health information related to the disease they had. For example, a person who had sleeping sickness largely engaged in information-seeking related to that disease. As noted by Carlsson (2000) and others, the current status of residents' health issues dictates the kind of information needed and what types of information-seeking activities the patient pursues (Carlsson, 2000; Huber & Cruz, 2000; Rees & Bath, 2000).

Uncertainty about the type of disease also influences communities to look for information. As discussed in the previous chapter, the rural Nigerian communities studied experienced various types of diseases. Some of these illnesses were not identified, or the community did not know how to interpret what the disease was. At this stage, the community recognized the disease as foreign, or as sort of an unsolved mystery. These conditions were the major reason the communities engaged in information-seeking as the result of low-quality health services and as well the fact that community members could not afford reliable information about uncertain sicknesses or diseases that affected their communities (Boudioni et al., 2001; Cotton, Kaye, Downey, & Butler, 2004; Evans & Welander Tärneberg, 2018; Oguntomole, Nwaeze, & Eremeeva, 2018).

Furthermore, the study found out that participants' personalities proved to be another factor in their health-information seeking. Personal Health Information (PHI) is a more precise description of the patient, that is, his or her health educational awareness about information-seeking activities, commonly known as consumer health information, as (Stavri, 2001) discussed.

This has been confirmed in other studies that identified the health condition and educational awareness as antecedent factors for people seeking information (Boudioni et al., 2001; Cotton et al., 2004; Leydon et al., 2000).

The study also found that the absence of basic health infrastructure was an important factor influencing the community in information seeking. As indicated by various participants in this study, the lack of an available hospital or local health clinic prompted some of them to take on the task of information-seeking by travelling to nearby health centers to look for health services. The study found the community to use the slogan, “Necessity is the mother of invention.” This confirms that in the absence of basic infrastructure, communities are forced to look for remedies for their information needs.

The study, too, found that several participants made the effort to look for information for preventative reasons—to protect themselves. Various participants mentioned that they engaged in information-seeking to avoid becoming sick, which might affect their neighbors or people in their community. Therefore, the sickness of someone in the community influenced others who were not sick to take preventive measures. This is in line with other studies that revealed that rural residents’ health issues dictate the kind of information needed and what types of information-seeking activities the patients pursue (Carlsson, 2000; Huber & Cruz, 2000; Rees & Bath, 2000).

One surprising finding the study reported is that the community was influenced in information-seeking as result of an emerging disease they found in their midst, a disease they did not recognize. The study reported that many participants cited several types of diseases that were new and strange in their environment. For most of these diseases, the residents could not find their

meaning in English. These circumstances triggered most of them to look for an immediate solution by engaging in information-seeking and -searching behavior.

In addition, the researcher observed the need shown by the community to keep updated about recent dimensions of the diseases they routinely have, such as diseases caused by mosquitos and tsetse flies. This stimulus helped spark their information-seeking process. Despite the lack of modern communication technology infrastructure, residents showed keen interest in learning about recent research findings in the treatment and prevention of common diseases. This finding supported various studies that reported that rural communities are in desperate need of new health information to address their problems. This need serves as a tool for their development (Abdulraheem I. Abdulraheem, Olapipo, & Amodu, 2012; Momodu, 2002; Obayelu & Ogunlade, 2006).

Also, the current study found that the causes of death among residents triggered information seeking, especially about malaria. As mentioned in the Results chapter, the community recorded a significant number of cases of loss of life as a result of the disease. This cut across the various age groups but was especially prevalent among children aged 2 to 10 years. The grief over losing loved ones triggered affected persons to engage in health information seeking.

Another problem discovered in the community was the lack of basic health infrastructure to quickly address the emergence of their health issues. This absence prompted people to devise various approaches to overcome their problems. This situation provided clear evidence of the community engagement in health information-seeking and searching. Similarly, well-being, or having a good life free from sickness or disease, was identified as one reason the community looked for information. This was more of a preventative measure. Most participants confirmed

that a person's well-being was a great asset to his or her development; they remarked that health is the backbone of any form of development.

5.2.3 Information-Seeking Behavior (RQ 3)

The third question of the study revealed the process by which the resident became involved in information-seeking and -searching behavior. Numerous types of information needs were indicated by the participants, as discussed above; this triggered the next step, the process of information-seeking and searching. Information-seeking would not be possible without the need. Particular needs have to emerge, and the information-seeking action will follow.

According to Vakkari (1999), information-seeking is a process of search, obtaining and using information for a purpose when a person does not have sufficient prior knowledge. This is similar to what Belkin (1997) stated, that information need refers to a human's recognition of existing knowledge that is inadequate to achieve a certain goal. The results of this study provide evidence of how rural residents participate in information-seeking activities related to their health concerns. The study noted that residents' current health issues dictated the kind of information needed and what types of information-seeking activities the residents pursued (Carlsson, 2000; Huber & Cruz, 2000; Rees & Bath, 2000). Some of the behaviors they displayed included the application of a traditional cultural approach in their health information-seeking and searching. This demonstrated two things: the community engaged in information seeking, which included the application of information they sought using traditional techniques, and the implementation of an idea that was revealed by previous experience and practice.

This finding corresponds to evidence revealed in other studies, which suggest that rural community information-seeking and -searching behavior applied the used of traditional methods

(Komlodi and Carlin, 2004). For example, the community frequently used traditional medicine or prayer to cure the sicknesses affecting them or their animals. Their belief was strongly connected with their traditional cultural and religious way of life. Some applied the use of charms and superstitions as ways of curing patients. This is in line with the study of Armenakis and Kiefer (2007), who investigated the social and cultural factors tied to health. That study revealed the theoretical evidence that culture affects information seeking; the cultural factors are the recognized beliefs, values, traditions, laws, and language of a nation or society. Cultural factors are systems of thoughts and integrated processes of the beliefs and behaviors of a particular people according to their background. Therefore, there are cross-cultural differences and process involved in of how communities search for health information.

As mentioned in the literature review, a similar approach discovered that the residents applied a modern approach in their information-seeking and -searching behavior. A handful of them recognized the presence of a small clinic and the resident doctor who addressed their immediate health problems. These included the application and use of modern medicine prescribed by the doctor. Similarly, those residents used modern strategies and techniques learned from an advisory council of medical professionals for the prevention and control of disease.

A surprising outcome of this study was the application of mobile technology by the local residents in their information-seeking and searching. Previous studies frequently reported that rural areas do not always have access to mobile technology to facilitate their social interaction in the community. In the literature review, little data was found on information-seeking using mobile phones in rural African areas, especially in Nigeria. Even though the study reported only a handful

of residents used this source, the study identified other patterns by which rural community members found their health information.

This finding was unexpected and suggested that the process of information-seeking behavior of rural community members was to embrace the technological transformation that the world is witnessing. However, the finding does not support previous research, which reported that the level of financial income or socioeconomic status of the participants played a big role in how they accessed information. Previous research has reported that adults with low income had fewer opportunities to use computers or browse from a mobile device, indicating the persistent digital divide between low- and high-income populations. The assumption in the literature is that informal health care in the form of traditional medicines and self-medicating are used only by those with lower education or literacy (Gibbon et al., 1998) or limited financial means (Waweru, Kabiru, Mbithi, & Some, 2003).

The majority of those who responded to the questions asked in the study reported that the interpersonal communication that exists among the residents was the main channel of information-seeking behavior. The study revealed this behavior was more attached to the traditional way of village communication, as confirmed by Nwagwu (2011), who studied rural women's health information needs and information sources in the palm oil business in southwestern Nigeria. That study reported 94% of rural women used interpersonal communication as the major source of health information.

Furthermore, as revealed in this study, most of the information acquired by the participants was through family and friends as the result of interpersonal communication. The community often used the observation method as way of finding information related to their health conditions. These

views confirmed the trial-and-error approach used by the community related to some of the sicknesses examined. For example, one of the interviewees stated, “*We observed the condition of our fellow when they fell sick and follow the process of their recovery, if it is successful, we take it as good information to apply whenever such incident arises again. This also applies to our livestock.*” This process conforms to Ellis’ model (1989), where the process involved the beginning and chaining of the questions posed. Also the findings are consistent with Um et al.’s (2010) study of menstrual hygiene among adolescent school girls in Kano, northwestern Nigeria. That study reported the impact of observation on mothers, girls, and other female relatives regarding their knowledge of menstrual hygiene (Beiersmann et al., 2007). Other studies confirmed that observation was used in the process of treatment and prevention (Lambert & Loiselle, 2007; Miller, 1995b).

Self-help seeking behavior were also found to be the reason the community looked for information. This trend is a more precise description of the patient and his or her health educational awareness of information-seeking activities, commonly known as consumer health information (Stavri, 2001). The study revealed their searching process was attached to the current situation they found themselves in. The communities suffered from the problem of mosquitos and tsetse flies, which caused diseases in both humans and animals. The searching process was more attached to the condition they had.

Psychologists study how people's behavior and conscious experiences can be defined, predicted, and influenced through lifestyle regarding information seeking. Furthermore, the aspect of psychological influence is more relevant to a consumer’s personal lifestyle (McGuire, 1976). Davison et al. (1997) provided a useful definition of lifestyle, which is “the aspect of health related

behavior and condition which entail an element of personal action at the individual level strongly associated with the possibility of individual choice and the triumph of self-control over self-indulgence” (Davison, Frankel, & Smith, 1997, p. 675). This includes personal health issues related to lifestyle, including diet and physical activity, tobacco and alcohol use, drug intake, and sexual activity. A related issue is the participants’ level of income, which greatly influenced the ability to access information among the participants interviewed. Research has reported that adults with low income had fewer opportunities to use computers or browse from a mobile device, this being the persistent digital divide between low- and high-income populations (Gibbon et. al., 1998; Waweru et al., 2003).

5.2.4 Sources of Information (RQ 3)

The survey revealed various sources the community engaged in as their source of health information. The sources were categorized into three forms according to their ease of availability. Frequently used sources of information included the use of traditional techniques, such as the use of traditional medicine from a traditional healer in a local language called Boka. The research revealed that the residents had high trust in this source, as confirmed in the study of the spiritual taboo in the use of traditional medicine (Ver Beek, 2000). Numerous other studies confirmed that rural residents heavily rely on traditional superstitions (Odebiyi, 1989; Rinne, 2001; Ver Beek, 2000). All of these studies confirmed the high acceptance of traditional medicine healers and the use of charms in a circumstance of sickness.

In addition, a study of Abubakar, Musa, Ahmed, & Hussaini, (2007) reported that Hausa and Fulani tribes actively engaged in traditional medicine and other superstitious beliefs. This source has been recognized and used for a long time; it is one source the rural communities mostly

depend on as their source of health information. However, it is a one-way channel of information access. Furthermore, the current study discovered that the communities used radio programs as a medium for acquiring health information. This process was similar to what was described above about the one-way communication system. Nevertheless, the communities relied heavily on the radio as a trusted information source.

Surprisingly, residents were not limited to only local radio station broadcasts in Medium Wavelength (MW). The study found that they listened to Short Wave (SW) frequencies on an international radio station broadcasting of a program in the Hausa language three times a day for 1 hour. International radio broadcasters the participants mentioned included the British Broadcasting Cooperation (BBC), Voice of America (VOA), and Deutsche Welle (DW) in Germany.

In addition to the international radio stations mentioned, the residents also listened to local radio stations within Nigeria, for example, the Radio Nigeria Kaduna (FRCN), Hausa service, Kaduna State Media Cooperation (KSMC), and other private stations such as Nagarta radio. Also, the community relied on their traditional rulers as their source of information, i.e., the Ardo (traditional village titleholder). The participant survey disclosed that the use of the Ardo was paramount because of the role he holds in the society as a leader and one who is able to communicate with relevant authorities, including the government.

These findings seem to be consistent with previous research that shows the majority of rural communities relied on radio broadcasting as their source of information (Momodu, 2002; Nwagwu & Ajama, 2011) and other studies that report that the Fulani community listened to programs in the local Fulfulde language (Martins, 2003; Okwu, Kuku, & Aba, 2007). This study

also reported that other sources of information were considered easily accessible in the community. These sources included the use of a nearby local hospital, information from the medical staff, the use of a local and state government health agency, and the application of the social media app WhatsApp.

As mentioned earlier, the communities lacked appropriate basic health infrastructure such as a hospital or small clinic for both humans and livestock. To overcome this obstacle, residents traveled to any nearby medical facility in Kachia, Kaduna, or Jos. These visits allowed the person to have access to medical personnel and to interact by asking questions regarding their health information needs.

The major problem associated with this source was a language barrier when communicating with the medical personnel. Not all residents are able to speak English, which the medical professionals are familiar with. Furthermore, the results brought to light an interesting phenomenon that has not been previously reported in similar studies, which is the use of the WhatsApp social media platform as a means of accessing health information. WhatsApp is considered to be the easiest way to share information or media content electronically, including audio, video files, and images (Ahad & Lim, 2014).

Many residents had limited Internet data and a poor mobile signal, which posed difficulties in information sharing, particularly on the WhatsApp platform. The WhatsApp application is believed to be one of the more popular and interesting Mobile Instance Messaging (MIS) systems used by a large number of users worldwide. MIS enable users to send and receive information via images, video, audio, and text messages in a real time to individuals and groups of friends at no additional cost. WhatsApp is estimated to handle over 10 billion messages per day (Church & de

Oliveira, 2013). The disadvantage of this source is that it does not have the capability to authenticate the shared source, meaning any information, whether it is reliable or not, can be shared and used. The result could be fatal if the members of the community used the wrong information. The study found the other sources used by the residents, but that were not always accessible, included the Internet (more broadly), browsing on a computer, research groups, and professional medical staff.

Several participants reported they gained access to health information as a result of browsing the Internet using the local mobile service providers Etisalat and Glo networks. However, the rate of dependability of these sources was minimal. The participants searched for Internet-based information on their phone on average twice a month or less. This was not frequent practice because the network was very slow, which discouraged browsing, coupled with the problem of poor connectivity. The duration of the search was typically not more than 15 minutes.

Internet browsing and access to information through WhatsApp differ because the latter requires a lower bandwidth connection for most communication, while other applications need higher bandwidth to enable a webpage to load, for example, via the Google search engine.

In terms of access to healthcare professionals, the community lacked frequent visits from research groups or medical professionals, who occasionally visited their community for research purposes. During their visits, the community used the opportunity to ask questions related to their health information needs, since most of the groups if visited their community stayed within the range of 3 to 7 days of their research work. The study discovered the main purpose of these groups of researchers or medical personnel was not meant for awareness but to conduct research.

Nonetheless, the process of asking questions enabled community members to gain additional knowledge of their problems or learn some techniques to overcome their health issues.

5.2.5 Difficulties in Information-seeking (RQ 4)

The study unveiled several problems the communities had with their health information-seeking and -searching behavior. It is apparent from the discussion in the previous chapter that disease was a major problem that affected the rural areas studied. The community suffered from various forms of sickness and disease, including the diseases they were familiar with and the ones they did not know. The residents were bewildered by the diseases and thus engaged in an active information-seeking and -searching process so as to overcome their health problems. The current study found more than 50 different types of sickness from which the communities suffer; this situation tends to be overwhelming with regard to how to approach the search process or what techniques to apply according to specific sicknesses.

Strong evidence in the study showed the absence of social infrastructure, which included medical facilities, drugs, standard education, clean running water, electricity, local meeting halls, and good roads. The lack of these facilities represented great obstacles to health and health information access. The findings of this study mirrored previous studies that examined the problems associated with rural and health information seeking. For example, Ajala et al. (2005) indicated the lack of available health care facilities was the main problem that prevented adequate health care service in rural areas, which another study also reported (Ademiluyi & Aluko-Arowolo, 2009).

Environmental problems were recognized by this study as another major challenge in information access by the community. The environment can impact the information need as well

as the way the information is sought in a variety of ways. For example, the physical and situational contexts are among those recognized to be influential factors in information-seeking behavior, but they do not operate in a vacuum. The grazing reserve where the community lives was established with the purpose of providing a place where residents could live and feed their animals for agricultural animal production, but it turned out to be a death zone because of various diseases caused largely by tsetse flies or mosquitos. Most of the communities complained the environment was no longer pastoral, as the grass for feeding their livestock was diminishing. The study uncovered that the grazing reserve grassland continued to decline and that it would not feed the large population of animals housed there. As result, the livestock owners moved around to pastoral habitat grazing areas further south for greener pastures. While the environment is important, it can impact users in different ways, so the impact of other factors, such as personal characteristics, the individual search task, the features of the information system, and so on, still play a role, even if the environment was deemed “perfect” (Marchionini, 1989, 1997).

Strong evidence in the study confirmed that the resident information sources were not *reliable*. Due the nature of the health problems in the community, people applied different strategies and looked for any possible health information to use to address their health concerns. This situation necessitated that they applied any health information they accessed in order to treat their sicknesses. As the study observed, most of the sources reported in the study were not scientifically proven, so it was not surprising that the community relied on traditional information sources when they were in desperate need. Previous studies reported the same behavior.

Another important problem in the community that infringed on their health information-seeking behavior was illiteracy. The majority of the residents were not educated, especially with a

modern Western education, even though they were educated in religious Islamic knowledge, as they could read and write in the Arabic Ajami script. Yet this was not sufficient to address the process of the information-seeking search. Foreign languages, for example, English, needed to be learned in the educational system. Therefore, in order for the community to be able to access or discuss issues related to their health concerns, it was paramount for them to have the knowledge of English as a tool to communicate and access the health information they were looking for.

Another problem found as an obstacle to the communities' information-seeking was that it took a long time for residents to find the information they were looking for. Records show that many of the residents lost loved one's due lack of quick intervention in the sicknesses they were afflicted with. This is not a surprising phenomenon, because several studies have confirmed that rural areas suffer a high mortality rate as result of poor and slow responses to adverse health conditions (Bradley & Gilles, 1984; Erah, Ogbaini-Emovon, & Amenaghawon, 2018; Musa, Salaudeen, & Jimoh, 2009; Wall, 1998).

Access to available information within the reach of the residents was another vital problem that affected the health information-seeking process. As various studies indicated, rural communities face various challenges, in particular the ability to access information, which is difficult. On a similar note, the study investigated the lack of almost all the basic primary facilities or avenues by which to access information. Also, the socioeconomic status of the community, which was described in the previous chapters as poor, was a major problem in information seeking. The residents were saddled with various responsibilities, including feeding their families, providing shelter, obtaining education, and, at the same time, having to address frequent and emerging health problems that have proven to be expensive.

As described earlier, most of the participants were living below the poverty line, with no certain occupation except raising livestock and farming. These two occupations did not yield a regular profit. Thus, the residents lacked sufficient financial resources to handle and address their health problems. Similar findings confirm this for the Ladugga Grazing Reserve (Ducrotoy et al., 2018, 2017; Wayo et al., 2017).

5.2.6 Distinctiveness of the Findings

The overall summary of the results of the studies reveals the uniqueness of the community health information-seeking behavior regarding the type of needs, factors that influence their needs in information-seeking and searching, the sources, and the problem they encounter. Some of these exceptional findings include the community approach to the treatment of sickness and disease, applying various strategies that are available within their domains. The resulting example shows the communities are more interested to know the ‘physical feature’ of the Tsetse fly compared to Mosquito. This, as a result, the danger tsetse fly posed to the community, and it is bigger than Mosquito (in size) and often visibly found in the community surrounding. Another uniqueness of the study is the report of other diseases, the study discovered the community suffered with, other than the problem of trypanosomiasis or Malaria, as in Table 11. The finding reveals a variety of different types of emerging diseases or sicknesses the participants and the community cannot confirm or figure what it is, or it is the origin. Examples of disease or sickness reported in table 11 include example *Boru, Animal, is eating plastic, Feet were worn out, Haboje, Hepatitis, Kirchi, Loss of pregnancy, Menstruation delay, Sickler, Swollen mouth, Ulcer, Vomiting blood through mouth & nose, watery and itching eyes, Zawo*, etc. Furthermore, the study also exposes various exceptional approach not frequently mention in similar studies of how the community use to

approach their information need satisfaction, and this includes the application of traditional technique, the use of mobile phone, observational method, patronizing the spiritual Islamic religion prayer session and the resources of 'boka' a traditional charm medicine provider for cure. Others include the application of a one-way information source the use of radio broadcasts. Ultimately, the results of the fourth research question highlighting the problem encountered by the communities in health information-seeking will open a new door for research to address in more depth some vital health problems the community suffered.

5.3 Grounded Theory Development

5.3.1 Overview

Along with the findings discussed above, a qualitative approach was used to further interpret the data. The process, as described earlier, followed the steps of open coding for qualitative data: axial coding that created categories of different attributes. The interpretation of those categories occurred during the selective coding process, as shown in Figure 19 and as defined by Corbin (1990). The grounded theory approach of axial coding is the process where categories are related to their sub-categories, and these relationships are tested against data because coding occurs around the axis of a category, linking categories at the level of properties and dimensions.

In order to gain a more in-depth understanding of rural communities' information-seeking needs, axial coding was applied to the existing categories that emerged in the initial stage of open coding. This helped in formulating emerging themes from the categories generated, as the categories were systematically developed and linked with sub-categories. Axial coding is always connected to qualitative research techniques. This involved rigorously comparing the emergent

themes within the data set to create an understanding of the theoretical framework of what the study is trying to explain.

To simplify the findings, the researcher further employed the standard practice axial coding paradigm of central phenomenon, causal condition, strategies, context, intervening condition, and consequence in conceptualizing the theory building. The questions asked included what the central phenomenon of the study is. This implies the phenomenon or central concept to which all other categories are related (Strauss & Corbin, 1990). The causal condition that influences the central phenomenon refers to the factors that lead to the occurrence of the phenomenon of the study. Similarly, the research linked the strategies paradigm that was used to address the phenomena. This involved the specific action or interaction as a result of the phenomenon and in what context the intervening condition shaped the strategies (Creswell et al., 2003). The final question was, what are the consequences of using the strategies (Flick, 2014)?

Root categories generated from sub-categories in the open coding process help in the process of axial coding to identify the central phenomena of the study, some of this categories include health information, sickness, diseases, resources used, health strategies, difficulties in information access, health infrastructures and facilities, information satisfaction. Most of these categories are similar to those used in studies discussed earlier in the literature review section. Furthermore, the process summarized what the research question asked, for example, knowing what the health information needs were, the process of information seeking, what influenced the information seeking, the sources used for information seeking, and the obstacles encountered while looking for the information.

The application of the axial coding paradigm is summarized in Figure 20. The process identified the core category “**health information needs**” as the central phenomenon to which all major categories are related. It appeared most frequently in the data, meaning almost all the research data pointed to the concept identified. These core categories were chosen without forcing or manipulating data but were sufficiently described in the data. The other four identified areas of axial coding were directly linked to the core categories identified, which included the causal conditions, labeled as “**diseases**” in the study. The specific strategies were the “**information-seeking process.**” The contextual and intervening condition was the “**health concern/sickness**” the residents were into, and the consequences attached to “**difficulties in health information access.**” The axial coding paradigm formed the basis of the selective coding process where all the categories identified are connected in the discussion and visualized in the model presentation.

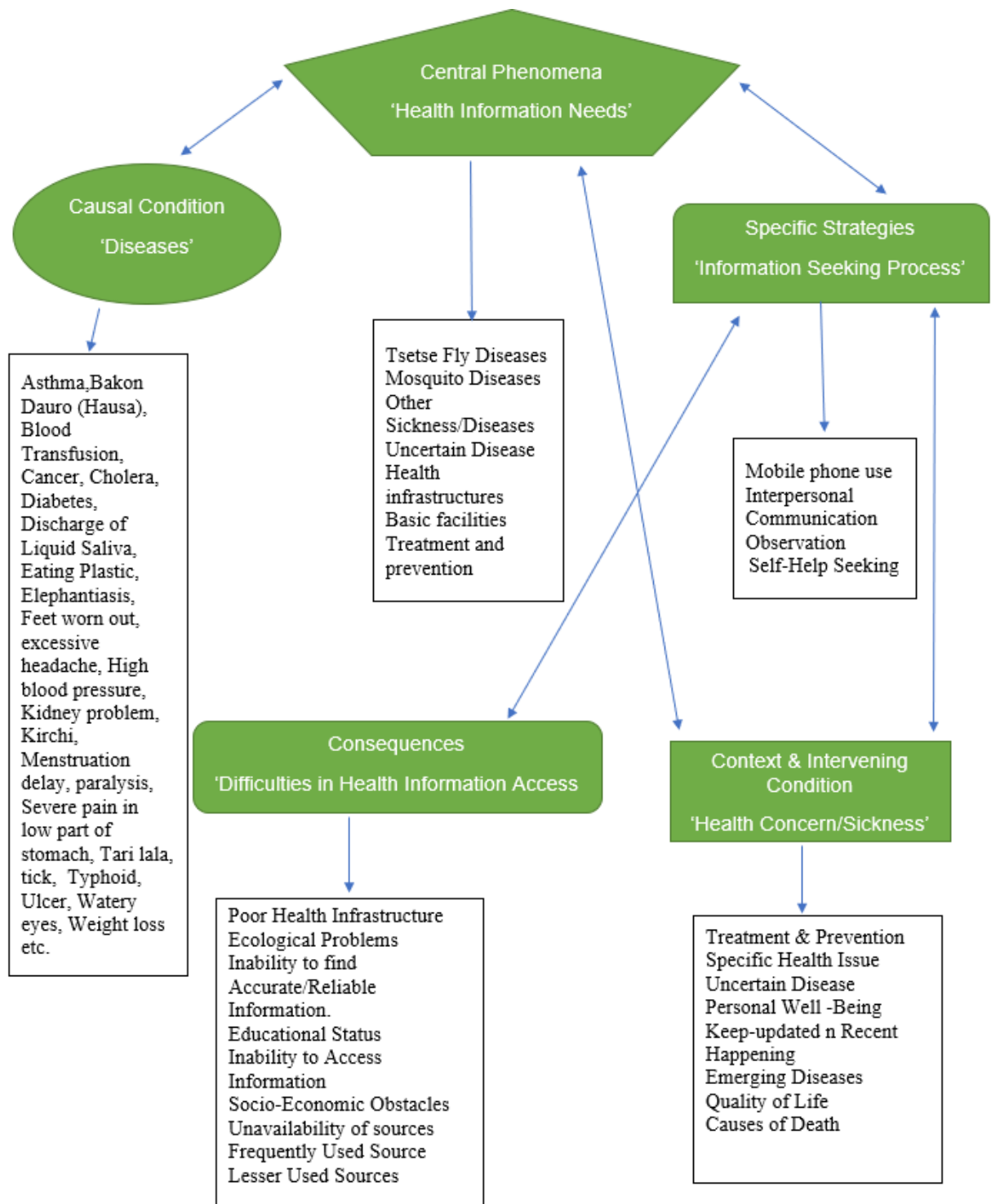


Figure 20 Axial Coding Paradigm Tree

The developed visual model, called the Rural Health Information-seeking Processes (RHISP) Model, appears in Figure 21.

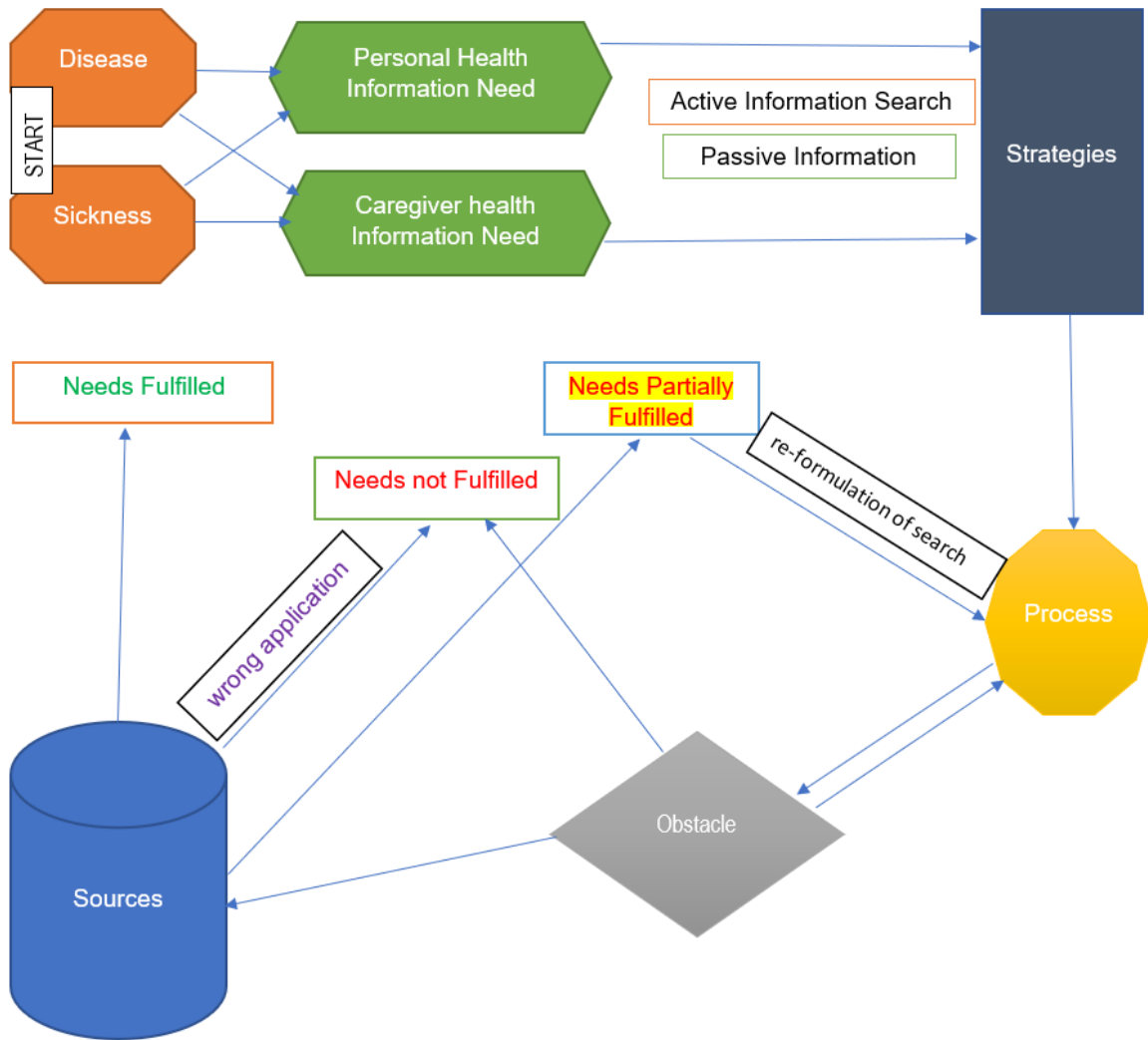


Figure 21 The Rural Health Information-seeking Processes (RHISP) Model.

5.3.2 Description of the Rural Health Information-seeking Processes Model

Based on the illustration of the model of rural health information-seeking and -searching behavior, two factors emerged: “diseases” or “sickness” that affected any part of the resident of the community and that influenced information retrieval and initiated an information help-seeking action. Based on the local perception of the rural communities examined, the terms “disease” and “sickness” have different meanings. “**Disease**” is considered a health concern or problem that affects the community, which forms part of their living condition. Many times, diseases do not trigger an active health information search. A person can have and live with a disease for a long time. “**Sickness**” is a situation when a person is infected with the disease, which then initiates the active information-seeking process. It is more of a psychological term where a person has a condition that requires immediate medical treatment. It is a sudden change that is more associated with a person feeling down.

These two important factors served as the first process that stimulated the zeal for a resident of the community to look for health information. The health information need was further categorized into two forms: (1) to look for health information related to a person’s health problem or (2) information needed by a family caregiver for another person.

The process of information-seeking is found to be either active or passive. The active search process requires the total involvement of the person to look for the information, applying all avenues or sources at hand, while the passive form of information-seeking is one in which the communities rely on available information provided in response to their health information needs. Both active and passive forms of information-seeking process were heavily relied on among the communities studied for this dissertation. Having identified the factors that influence the

information need, the next process, according to the model, is the application of strategies for finding the health information needs; this is a stage where the information seeker attempts to answer the question of the gap in knowledge related to the diseases or sickness associated with them.

This study demonstrated that the communities were deeply engaged in multiple types of search strategies. The community residents had various types of strategies with which they explored potential answers to their health questions. Some of these included the application of traditional methods of acquiring health information; the use of a modern approach, including the local clinic, hospital, and/or interpersonal communication among the communities; and exchanging ideas and concerns. The strategies they applied were linked to variables that would facilitate and enhance the process. Having the information seeker identify the strategies to use in addressing the gap in the information needed, the communities' searching process continued to explore the appropriate available sources that would meet their health information needs.

As result, the information seeker engaged in the process of reaching the required destination for the information sources. However, there were numerous obstacles along the way (Figure 22). Some of these obstacles caused the information seeker to get stuck, which then required that he or she return to the drawing board, re-strategizing his or her idea, and starting the search process again. The information seeker dwelled along the paths between strategies and sources for long periods of time, sometimes looking for the health information and at the same time trying to overcome the hurdles on the way. These hurdles included all factors that infringed on the information seeker before arriving at the source destination. This process continued iteratively, sometimes for a long period.

For some of the information seekers who were able to arrive at the source of the health information, one of three things occurred: (1) the information needs were fulfilled, (2) the information needs were partially fulfilled, and (3) the information needs were not fulfilled. The study also revealed that the source itself might not give the comprehensive health information the resident required. The model clearly illustrates that if the information needs were met from the sources consulted, resulting in an improvement in the person's health. If the information needs were partially met this may cause the information seeker to return to the re-formulation strategy and try another option. The third option was when the information seeker received health information, but the information need was not fulfilled. This result could lead to deterioration of the health condition, which in the most serious cases could result in death. This situation could occur when the health information identified to treat the sick person was not scientifically or medically approved, for example, the application of traditional medicine or use of non-prescribed modern drugs.

The discussion above explains the process the rural community used from the stage of information need to the sources. The model also showcases the search activities and the process used in the health information-seeking task. Furthermore, it reveals some of the factors influencing the search process. Also, the finding illustrates the multiple sources the community relies on in health information-seeking and associated problems.

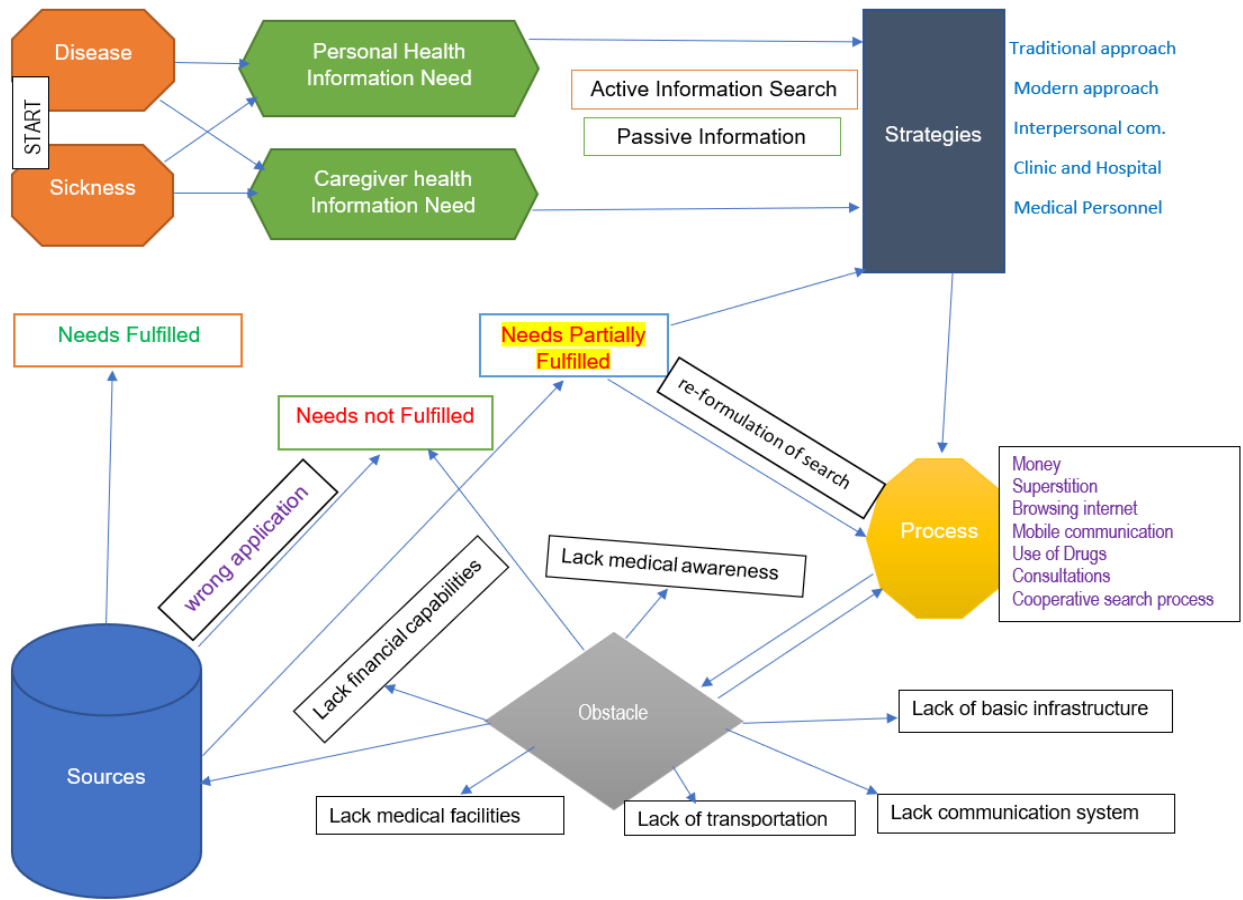


Figure 22 Descriptive Rural Health Information-seeking Processes (RHISP) Model.

The model clearly confirmed the information search process in which the information seeker began as the result of the situation they were in, that is, as a result of the “disease or sickness” they found themselves addressing, as described by Kuhlthau’s (1988) information search process model. The first stage of information-seeking began with initiation, where the individual was confronted with the task of recognizing his or her need for information. In this study, this phenomenon was found to be the health problems affecting the communities, as described above.

This was a situation where a person in the community identified that he or she had a health problem or disease and needed to find information about it. This problem could either be that of the information seeker or that of another person in the family. As a result of this information need, the search process could begin in which the resident initiated the information-seeking process to address the health concerns. These processes are more similar to what Savolainen (2005) stated in the everyday life information-seeking model (ELIS). The model involves “non-work” activities related to action of information behavior that previous models had neglected; this includes shopping, taking care of our home, our personal interests, pursuing our hobbies, etc. The model is more incorporated with sociological and cultural concepts because of its nature of studying the personal behavior of individuals in non-work contexts. Savolainen’s model is ultimately concerned with what he called “Mastery of Life” (Case, 2012).

The degree of seriousness of the community in information-seeking was found in the later phenomena “sickness,” because they were already inflicted with the problem of sickness. In this situation, they were desperate for information. The model also points out that as soon as the community discovered and realized they had problems; residents engaged in stimulus behavior of active information seeking. This process was similar to the first two stages of Dervin’s model, where (1) there is a situation in which the problem arises, (2) there is a gap between a person’s current awareness of a situation and where he or she would like to be, in terms of knowledge (Savolainen, 1993). These situations are further extended to be as “health information need”; this refers to the situation where the user realized he or she need information to solve the problematic state of knowledge they were in, as describe in Belkin’s theory of Anomalous State of Knowledge (Belkin, Seeger, & Wersig, 1982).

The information seeker proceeds to the process of finding self-health information or for their loved ones as caregivers. The community further strategizes about various avenues and sources to consult for immediate information satisfaction. The process reveals multiple approaches that depend on person-to-person interaction. As Leckie's model emphasizes, the approach to information search is perceived as the concept that creates an awareness of information sources or content and influences a person to survey those sources (Case, 2012). This strategy, as described in the axial coding paradigm, signified that the community had difficulties in finding information. For this reason, various approaches were used, applying the top-level model concept of Krikelas that "information gathering" and "information given" that are stimulated by activities in the contextual environment of information seeker. It emphasizes the importance of uncertainty as a motivating factor potential for an information seeker to find an answer from his cognitive memory (Ingwersen & Järvelin, 2005a).

Various elements were discovered in the process of gathering the information strategies of the rural community health information seeking. Those strategies included various processes the residents applied to reach certain conclusions about the sources they consulted. As shown in the model, the process residents applied in their health information-seeking occurred in multiple directions as the communities varied in their approach to the health information searching process. The process of information-seeking was a two-way, forward-and-backward system. This refers to a situation where there may be possibilities for the community to test different process until they are satisfied with the information they were looking for. The process occurred between the "strategies" and the "process" they applied, meaning residents might test a certain process; if they

did not succeed, they would abandon it and try other processes that were conceptualized within the strategies they formulated.

In between, the search channels of the “strategies,” the “process,” and the anticipated “source” presented problems and difficulties in accessing the information. As described by Dervin, there may be a situation where the user is going along in information-seeking and searching but might stop completely when he or she realizes that there is a gap in their knowledge, or a “cognitive gap”; the user cannot move forward again until he or she bridges the gap with knowledge (Dervin, 1983). However, as described in the model, the community did not relent as a result of the failure of the process, but they re-strategized new processes for their health information quests. This is in agreement with what Case (2012) stated, that users engage in cluster activities, making direct demands of a source or system of information; the result can either be successful (in which the case the information is “used”) or a failure, in which it is presumed the information is not found and cannot be used.

As the process is established, the process of health information searching continues, identifying the available infrastructure that will be the target of the source. In the cognitive strategies, the rural resident conceptualizes the process they will follow in which any process they undertake must take into consideration the available infrastructure that will facilitate acquiring the source. For example, when residents were infected with malaria, they strategized ways in which to meet a medical doctor and get treated with prescribed drugs. In this situation, the person in the community applied a process of how he or she would meet the doctor from the available resources they had (i.e., clinic or hospitals) to get treated.

This example signifies that the process of information-seeking will continue to flow to the source of health information depending on the available infrastructure of the source. This means if the process is strategized toward the required source, but the source is not accessible, that will result in the failure of the information-searching process. This will return the user to the drawing board of “strategies,” where he or she will re-formulate other processes for a second try at information seeking. In a nutshell, the accessibility of the infrastructure sources is determined by the process used.

The findings are similar to Bates’ berry-picking model, which describes four layers, including the infrastructure layer, comprising the network, hardware, software, and database; (2) the information, or content combined with a metadata structure; (3) the information retrieval system itself; and (4) the human part of the system, which is comprised of the searching activities and user understanding and motivation (Bates, 1989; Chowdhury, 2010). It may be argued that the model is more specific to a digital information retrieval system, but in in this situation, it has elements that support the findings, as reported above.

Based on the diagram of the model, the strategies and processes the rural communities applied in information-seeking take into consideration the available infrastructure that will facilitate getting to the source, as can be seen in Figure 23.

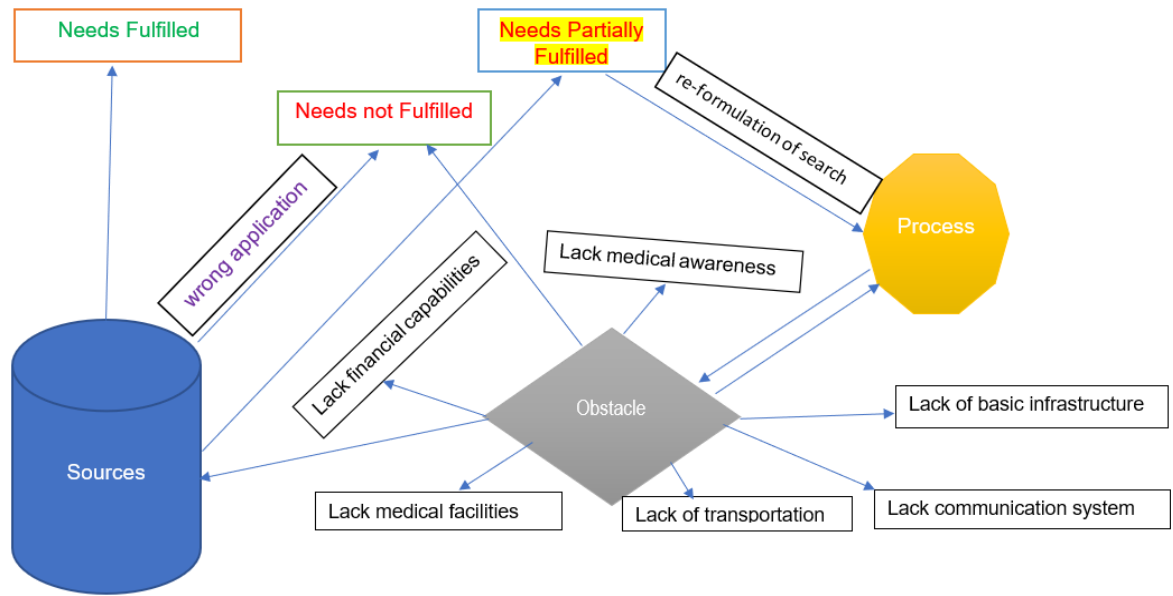


Figure 23 The process-obstacle to the source of information the community used.

As the community moved along the channel of strategy and process, they were likely to encounter obstacles along the way. These obstacles were observed to be temporary along the process of information seeking, or they could be a strong block that made the information-seeker return to the drawing board of strategies for re-planning. Also, as indicated, there were multiple problems that might arise during the process of reaching the source of information. Those problems were generally found to depend on the type of approach or process the community applied to look for information. For example, the community was interested and engaged in mobile phone browsing information-seeking even given the limited Internet service they had. Strategically they would opt to apply the searching process using the mobile phone with the available Internet service they had.

The process could stop or continue at any point if problems occurred along the way, maybe the lack of a good signal. This obstacle forced the information seeker to return to the drawing board

to re-formulate another approach. This practice supports what Dervin frequently said in the sense-making approach model, namely, that a user might stop completely when he or she realizes that there is a gap in their knowledge.

Furthermore, Xie's (2007) planned situation model further supports the finding that the plan and situation of an individual user co-determines the user's selection of information-seeking strategies and the shift in information-seeking strategies as time continues. Her model includes the level of user goal, the level of tasks and their dimensions, personal information, infrastructure, the social-organizational context, information retrieval system, plans and their dimensions, situations and their dimensions, and information-seeking strategies.

Similarly, this process also supports the Freimuth, Stein, and Kean model (2014), designed as a health information acquisition model utilized in studying the Cancer Information Service (CSI). The model has six stages: stimulus, information goal setting, cost-benefit analysis of search, search behavior, information evaluation, and decision point on adequacy of information. The stages are part of a decision-making form within a flowchart format in which the decision in each stage determines whether one can advance to the next level or repeat the previous ones. As in the case of the rural community studied, the developed model clearly supports the first two-stages Freimuth mentioned (Lalazaryan & Zare-Farashbandi, 2014; White, 2016).

The final stage of the information-seeking process is when the source that the community targets is found. As discussed earlier, there are difficulties and challenges before the person looking for the health information can arrive at a source destination. Many of those obstacles force the information seeker to return to the drawing board. As the information seeker successfully crossed the hurdle and arrived the to the promise land of the information source, one of two things

occurred: satisfaction or return to the drawing board for strategy re-formulation. The uniqueness of the model is that it takes an important step in the identification of different types of information-seeking situations the residents find themselves in. Mostly what is exceptional about the model is the stage at which the resident formulated the idea to conceptualize the process or the channels they would follow to achieve their health information access. Various models have similar steps, but the uniqueness here is the context the information seekers used to strategize about their ideas in their information-searching process.

5.3.3 The Uniqueness of the Model

One of the apparent unique aspects of the model, when compared to other models related to general or health rural information behavior, is that it illustrates the general process of health information need and seeking behavior of the rural resident. The model visualizes the process of Kachia Grazing Reserve's health information-seeking and searching behavior. It is an addition to the fewer or no model that reports how rural Nigeria or Africa engage in their health information seeking. Part of its exceptionality it demonstrates the health information-seeking behavior 'start' and or triggers as a result of the two major components identified in the study which is 'sickness' and or 'disease' that affect the resident of the community. This significant component initiates the start process of health information seeking. The model also shows the recipient of health information need and seeking are categorize to either individual with personal health situation or to a caregiver applying the active or passive searching process, and that depends on the situation or the context of health concern. Another uniqueness of the model is the various strategies the communities apply in the process of their health information seeking, which include the application of different methods and tactics that are available within their domain. The strategies they use are linked to the

variable that will facilitate or enhance their searching process. The model also informed the difficulties the participant has in the process of accessing to the sources. Those hurdles are reported to returned individuals to the drawing board to re-formulate their search strategies process (again) or halt. Another uniqueness of the model is how it exposed the various sources the communities rely upon for their health information needs, some of them which are not reliable in terms of certified to use. The final outcome revealed in the model show need are categorized into three phases. This implies either the information seeker 'fulfilled the need' or 'partially fulfilled' or 'not fulfilled.'

5.4 Implications of the Study

The results of this dissertation have theoretical, practical, and methodological implications. This section highlights the contributions of the study findings to knowledge about the health information-seeking behavior of residents of rural communities in Nigeria.

5.4.1 Theoretical Implications

As we know, most of the theories and models discussed in Chapter 2 were developed around Western ideas, and that may limit the understanding of the information-seeking and information-searching behavior of rural residents of Africa. However, the model generated from this study adds understanding to our existing knowledge of how rural residents, especially in Africa, engage in the process of information seeking. The model visualizes the activities the communities followed related to their information needs and their seeking and searching behavior; the factors that influenced their searching activities; the sources they relied on to fulfill their

information needs; and the problems they encountered while searching for the information they needed.

Some of the theories and models discussed earlier have shaped our understanding and add knowledge about resident health information behavior within the context of rural communities. Those theories and models help us understand that the concept of health information-seeking behavior needs to be examined within the context of a person's personality and associated problems. This is clearly hypothesized by Taylor, Dervin, and Belkin. Various studies have been conducted related to Dervin's models, including what Xie (2008) reported, that Itoga (1991) studied an alternative framework focusing on how to understand a user's need. Spink and Cole (2006) studied the integrated model to represent humans in information behavior and use by applying everyday life to information-seeking and a sense-making approach.

Another problem that can occur at this stage is that the source the community reached may not be certified, because some of the sources discovered by the residents in the study were not authentic or reliable sources. Often the sources of health information they relied upon were questionable.

5.4.2 Methodological Implications

Choosing an appropriate research method is very important and will determine how to identify an appropriate answer to the research questions (Punch, 1994; Silverman, 2013). Based on the nature of the research questions, both qualitative and quantitative approaches could be used to gather data, as applying the two methods will be the best in addressing the overall research objective, with a second method supporting a primary method (Creswell, 2012). However, research methods are employed based on the nature of the research problem investigated (Morgan

& Smircich, 1980), as these methods are concerned with how we can find out what kind of principle is at work. Therefore, this dissertation used a qualitative grounded theory approach to answer the research questions about the consumer health information-seeking and -searching behavior of rural communities affected with vector-borne diseases. The design used in this study relied on the triangulation approach of the use of questionnaire, interviews, and focus group discussions. This allowed access to data collection and to understand the in-depth perceptions of the community members studied.

The richness of data revealed in the study confirms the suitability and appropriateness of using a qualitative method in conducting studies related to rural communities, more especially the application of the triangulation method of data collection. A model was developed for the process of health information-seeking and searching among the rural communities examined. The analysis through the application of NVivo software version 12 and the grounded theory process informed the current status of how rural communities engage in their information seeking. The model further simplifies the direction and the process the rural communities followed in their health searching process.

Even though there are a limited number of studies that address the area of rural communities' health information-seeking and -searching behavior, at least this study is strong in contributing to the literature on rural community health information seeking. This study confirmed the suitability of applying the triangulation method in conducting a study in a rural area of Africa, as both data instruments complement each other, and as data was gathered from different sources at different times and in various situations (Denzin, 2012).

In addition, the study accentuates the need for research to focus on the study of rural communities, especially in Africa, to learn about their health information behavior. Another implication is that the choice of a qualitative approach for data collection will be a good test to address the problem of data collection in rural communities in Africa. The unique combination of the data collection instruments, and the method applied for data analysis for this study proved to be a good fit to achieve richness of data, since the focus groups elicited information about participants' health information-seeking in a discursive format.

The study also contributes to the recognition of a methodological approach to be applied when conducting similar studies in rural African communities. As explained in Chapter 3, the data collections methods and tools the study employed, such as the questionnaire, interview, and focus group discussions, are considered Western approaches and have many negative associations for some Africans, particularly in Nigeria where the research took place (Ajayi, 1980; Orellana & Bowman, 2003; Peña, 2007; Van de Vijver & Leung, 1997). Traditionally the data collection instruments used for studying human subjects, including questionnaires, interviews, and focus group discussions, are considered a Western style of gaining knowledge or information, which is not wholly suitable or matched to African religious or cultural approaches for obtaining information in research, especially the Kachia Grazing Reserve, the site of the study.

As a result, the researcher encountered various challenges, including the recruitment of participants in rural communities, acquainting participants with the process of conducting a questionnaire or a recorded interview, jotting research information on paper, and gathering participants in one place for focus group discussions. To avert some of these problems, different strategies were used to collect data without tampering with the original concept or process of

(Western) data collection and Institutional Review Board (IRB) regulation. The researcher took into consideration the ethical and cultural practices of the rural communities. His approach created, expanded, and added a new tips and techniques to apply to the process of data collection in rural African communities that can be used for other similar research studies as to achieve maximum results.

5.4.3 Practical Implications

The findings of the study not only confirmed that health information access is crucial to the rural communities examine, but they also revealed the specific methods the rural communities in the Kachia Grazing Reserve used for their health information searching process. It identified the process of health information needs and seeking and searching among the community infected with vector-borne diseases, because health care seeking is the primary objective. This is defined in its broadest sense as relating to health care access, service use, and the way in which people respond to their perceived ill health (Ahmed et al., 2000).

Therefore, the findings of the study expose the urgent need of rural communities for previously unavailable information and how to properly address this need. This can be done by identifying the type of health information needs the rural communities had, identifying the sources they used, and knowing the information-seeking behavior they engaged in. This will also help determine the awareness of rural communities about common diseases and propose solutions to problems they encountered during the searching process. Focusing on what people do in terms of information-seeking will improve the process and provide solutions for the ineffective processes the communities have used in information seeking.

The study also highlighted the dangerous situation of patients assuming that unreliable sources are the right channels in information seeking. The findings of this study will be of benefit to governments and policymakers for proper monitoring of the communities affected in order to address the issue of proper implementation of their development policies.

Another result of this study is that it helps stakeholders and international organizations have up-to-date, comprehensive data for organizations conducting tracking and surveillance, including the African Union (AU), United Nations (UN), World Health Organization (WHO), European Commission (EU), U. S. State Department, and other nonprofit organizations. Finally, this study opens a new chapter of scholarly understanding of rural communities' information needs and seeking and searching behavior. This study can serve as a reference tool for further investigation of the area affected for future studies.

5.5 Limitations of the Study

Research methods employed are based upon and depend upon the nature of the research problem being investigated (Morgan & Smircich, 1980). Research methods are concerned with what kind of principle, logic, and evidence would best be used to gain knowledge of an area or object of study (McPhee, 1994). Some have stressed that method is one's point of interaction with the world, a point at which the research methods are a conscious attempt to (collectively) overcome some human shortcoming, while promoting dialogue among scholars and researchers (Chowdhury, 2010).

The limitations of this study are more attached to the methods used in conducting the research. Limitations may be more pronounced if the study undertakes the investigation with a mix-methods approach. This is because researchers use research designs to address different

aspects of the research procedure, from philosophical assumptions to data analysis. A design might be considered mixed if it employs qualitative and quantitative approaches at any stage, including research question development, sampling strategies, data collection approaches, data analysis methods, or conclusions (Creswell & Clark, 2007; Creswell & Garrett, 2008). Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., the use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration (Johnson, Onwuegbuzie, & Turner, 2007).

Recent empirical studies concerning health information conducted by mixed methods revealed that lack of integrating the qualitative and quantitative methods. Lewin, Glenton, and Oxman (2009) reported that lack has limited the number of findings expected (Latham & Locke, 2007). This was confirmed by health research studies conducted independently, either qualitatively or quantitatively (Barbour, 1999). Also, O’Cathain, Murphy, and Nicholl (2007) reported that studies that applied both qualitative and quantitative methods were exposed to examining different aspects of overall research questions for effecting the validity of the results (Sandelowski, 1995).

The findings of this study are also limited by the study context and population sampled. The sample size used in the study is not enough to significantly generalize the results to the entire community’s health information-seeking process but only gives a piece of what is present. Similarly, the context of the study selects a certain small area within Kaduna State, Nigeria, which can be insufficient to generalize the results, considering there are numerous similar communities spread across the states.

In addition, another limitation is that the amount of time the researcher had in collecting the data was minimal; he could not gather enough information or communicate and interact deeply with the communities, as in an ethnographic study. Also, another limitation of the study was the financial resources available to conduct the study. The limited amount of money used in the study was, however, enough to comfortably address every issue that a research study of this nature required; this was coupled with the limitation of there being an only one person conducting the study, which ideally should be a group project.

CHAPTER 6

Conclusion

6.1 Introduction

The previous chapters discussed the findings of the study, the explanation of the model generated, and the research implications, which included the contribution of the study to practical, theoretical, and methodological approaches. This chapter summarizes overall important findings of the information need and the seeking and searching process of rural communities related to their health problems and future directions.

The purpose of this dissertation was to investigate the health information needs and the seeking and search behavior of some communities that are particularly affected with selected vector-borne fly diseases in Nigeria. Studies confirmed that most of the above-mentioned diseases and other sickness are mainly found in rural areas in Nigeria and constitute the highest frequency of occurrences (Abegunde et al., 2016; Babamale & Ugbomoiko, 2016; Janssens et al., 2016; Mphande, 2016; Odikamnoru & Ikeh, 2016; Solomon, 1993; Uba et al., 2016). Due to the complications of village poverty, combined with the effects of the vector-borne flies, learning more about how people find and use consumer health information is of great importance. People increasingly can find and use consumer health information due to several critical changes in society, including the development of information technologies such as the Internet and the rapid changes that have occurred in the health care environment (Masur et al., 2002).

6.2 Summary of Research Findings

The key findings of the study reveal the process that residents of the rural communities studied used to find their health information. The process of finding that information was challenging, but the circumstances they found themselves in motivated them to find the means to satisfy their information needs. Two major needs were health information about two insects, the tsetse fly and the mosquito, which caused major problems in their communities. The other information needed was related to the general health condition of the communities. The types of diseases and sicknesses in the communities included, for example, typhoid fever, ulcers, diabetes, and hypertension.

The study also found other issues that influenced the communities' information seeking, which included the health problems of loved ones, the uncertainty of their health conditions, and the personal drive that motivated the health information search. Another community concern was the lack of basic health infrastructure, confirming the proverb "Necessity is the mother of invention." Residents also looked for information on prevention and to keep up to date about recent happenings in the field of medical health research and development. They also wanted to protect themselves against emerging diseases, and they were looking for health information to improve their quality of life and to avoid the rates of death that the communities experience as a result of diseases that affect them and their animals.

In addition, this exploratory study also revealed the details of the communities' information-seeking and -searching process. Some of these included the application of traditional techniques to find health information, such as using traditional medicine or medicine sellers, as well as the use of modern disease treatments and prevention. Others included the application of

mobile telephone technology to retrieve information. Residents were also found to have interpersonal communication systems for information sharing and dissemination. The study found participants applied the observation technique in their information-seeking process, using the process of trial-and-error based on past incidents.

Additionally, the study revealed various sources from which the communities got their health information. These sources were classified into three different categories: the most frequently used sources, lesser used sources, and rarely used sources. The frequently used sources were those available all the time, such as their traditional tribal leader, the “ardo”; the traditional medicine healer, the “boka”; listening to local radio broadcasts; and visiting the small clinic located in one of the communities. The lesser used sources included the hospital near their communities, local medical and health personnel, and the use of a mobile phone to communicate to the city asking questions about their health concerns. The rarely used sources included browsing the Internet and the presence of experienced research teams in the communities.

The findings of the study also identified various problems that affected the communities in the information-seeking process, which included the lack of basic health infrastructure, the presence of various diseases, ecological and environmental problems, the lack of reliable sources of information, and the poor education system of the communities. Other problems found were the longer time taken to access health information and the socioeconomic status of the communities, which prevented them from accessing reliable health information.

Finally, the findings from the study generated a model detailing how rural communities engaged in health information-seeking activities, with the central phenomenon as “the process of rural communities’ health information needs.” The model visualized and showcased the search

activities and the process used in the health information-seeking task. Furthermore, it revealed some of the factors that influenced the search process. It also illustrated the multiple sources the community relied on in health information-seeking and the problems associated with it. The model established support for some information-seeking theories and models, including those of Belkin, Kuhlthau, Elis, Dervin, Savolainen, and Leckie.

Moreover, the model highlighted the contribution of the study to theoretical, methodological, and practical implications. Theoretically, the model contributed to a new knowledge of understanding of how rural communities in Nigeria engage in the process of information seeking. Furthermore, the richness of the data revealed in the study confirmed the suitability and appropriateness of using a qualitative method in conducting studies related to rural communities, more especially the application of triangulation in the data collection. The study highlighted the practical process of the rural community's information-seeking by identifying the process the communities followed in their health information-seeking efforts, including the various ways they used to address misinformation. This study exposed the practical process the community residents followed in information seeking.

6.3 Directions for Future Research

The results of this dissertation open a new phase of scholarly work toward understanding the in-depth health information behavior of rural communities in Nigeria and more broadly. As stated earlier, the research design and the methods employed for this study have some limitations; these limitations could be addressed by future studies, for example conducting similar studies of rural communities' health information-seeking behavior with an extended data collection period.

This would enable us to learn more about how rural communities engage in consumer health information-seeking behavior.

Similarly, the methodological approaches of this study and other ideas used to address rural communities in Africa, particularly Nigeria, will broaden the scope of how the data collection exercise should be approached in consideration of cultural as well as religious customs in the rural communities studied. Furthermore, future research would expand the knowledge of disparities of rural communities in Africa, particularly in Nigeria, regarding the process the rural communities used to address their health concerns. The results of the fourth research question highlighting the problem encountered by the communities in health information-seeking will open a new door for research to address in more depth some vital problems. Possible future research inspired by this study could be the exploration of other cognitive, physical, social, and affective factors that influence residents in the health information-seeking and -searching process.

In conclusion, this dissertation has contributed to the knowledge of rural Nigerian communities' process of health information seeking. The study exposed the process, sources, and challenges residents used while engaging in information-searching activities. Also, the current study highlighted the importance of providing access to health information to rural communities and provided a holistic view of the current practice of the communities' process of health information-seeking as an extension of similar theories and models of health information-seeking behaviors.

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Appendix A Institutional Review Board Approval (IRB)



Melissa Spadanuda
IRB Manager
Institutional Review Board
Engelmann 270
P. O. Box 413
Milwaukee, WI 53201-0413
(414) 229-3173 *phone*
(414) 229-6729 *fax*

Continuing Review - Notice of IRB Expedited Approval

<http://www.irb.uwm.edu>
spadanud@uwm.edu

Date: December 6, 2018

To: Wolfram Dietmar, PhD
Dept: School of Information Studies

Cc: Musa Dauda Hassan

IRB#: 18.098

Title: Consumer Health Information Needs, Seeking and Searching Behavior on Selected Vector-Borne Diseases by Rural Residents in the Kachia Grazing Reserves (KGR), Nigeria

After review of your research protocol by the University of Wisconsin – Milwaukee Institutional Review Board, your protocol has been approved as minimal risk Expedited under **Category 6 and 7** as governed by 45 CFR 46.110.

This protocol has been approved on **December 6, 2018** for one year. IRB approval will expire on **December 5, 2019**. If you plan to continue any research related activities (e.g., enrollment of subjects, study interventions, data analysis, etc.) past the date of IRB expiration, a Continuation for IRB Approval must be filed by the submission deadline. If the study is closed or completed before the IRB expiration date, please notify the IRB by completing and submitting the Continuing Review form found in IRBManager.

Any proposed changes to the protocol must be reviewed by the IRB before implementation, unless the change is specifically necessary to eliminate apparent immediate hazards to the subjects. The principal investigator is responsible for adhering to the policies and guidelines set forth by the UWM IRB, maintaining proper documentation of study records, and promptly reporting to the IRB any adverse events which require reporting. The Principal Investigator is also responsible for ensuring that all study staff receive appropriate training in the ethical guidelines of conducting human subjects research.

As Principal Investigator, it is also your responsibility to adhere to UWM and UW System Policies, and any applicable state and federal laws governing activities which are independent of IRB review/approval (e.g., [FERPA](#), [Radiation Safety](#), [UWM Data Security](#), [UW System policy on Prizes, Awards and Gifts](#), state gambling laws, etc.). When conducting research at institutions outside of UWM, be sure to obtain permission and/or approval as required by their policies.

Contact the IRB office if you have any further questions. Thank you for your cooperation and best wishes for a successful project

Respectfully,
Melissa C. Spadanuda
Melissa C. Spadanuda
IRB Manager

ASSALAMU ALAIKUM WARAHMATULLAH

(Peace and Blessing be upon to you all) Islamic greeting

Questionnaire

My name is **Musa Dauda Hassan**. I am here in your community to ask for volunteers to participate in my research study as part of the fulfillment of my doctoral program in Information Studies. The Title of my study is “Consumer Health Information Needs, Seeking and Searching Behavior on Selected Vector-Borne Diseases by Rural Residents in the Kachia Grazing Reserves (KGR), Nigeria.” The purpose of this study is to better understand your health information needs and how you are engaging in information-seeking and searching behavior, specifically related to diseases associated with the Tsetse fly and Mosquito in your community.

Participants must be at least eighteen years of age who can read and write in Hausa and Ajami script writing. As a participant in this study, you would be asked to participate in the completion of a questionnaire. You may also be invited to take part in an interview or focus group session. You would be asked to share your experiences in fulfilling your information needs and information-seeking activities that address health-related issues related to the tsetse fly or mosquito in your community and more general health information needs. The questionnaire will take 20-30 minute to complete the interviews will take about 10 to 15 minutes to complete. Participation in the focus group may take up to one hour to complete. The interviews and focus group session will take place at some point in time after the questionnaire. Interviews may take place in Mosques or

a private room in this building or at another location convenient for you. The focus group session will take place in this building at a time that is convenient for those participating. The interviews and focus group session will be audio recorded, but your identity will be kept confidential. Questions will be limited to your daily information needs and how you look for information. In appreciation for your time and participation, you will receive an individual gift card of N1000 Naira at the end of each part of the study in which you participate.

If you are interested, please submit your name to me **Student Principal Investigator Musa Hassan or Ori Muhammad (the local contact person)**; I will be staying in the community for 2 days.

Thank you.

Musa Dauda Hassan (Student Investigator)

University of Wisconsin – Milwaukee

Consent to Participate in Survey Research

Thank you for agreeing to participate in this survey. My name is **Musa Dauda Hassan**. I am responsible for conducting this research study as part of the fulfillment of the Doctoral program in Information Studies. The Title of my study is “Consumer Health Information Needs, Seeking and Searching Behavior on Selected Vector-Borne Diseases by Rural Residents in the Kachia Grazing Reserve (KGR), Nigeria”

Study Description: The purpose of this study is to better understand your health information needs and how you are engaging in information-seeking and searching behavior, specifically related to diseases in your community associated with the Tsetse fly and Mosquito. This survey will ask you some questions in a paper form about some of your health information needs, and the seeking process and searching behaviors you engage in. You must be 18 years or above at the time of the study. It is expected that it will take about 20 to 30 minutes of your time to answer the questionnaire.

Risks: There is no risk to the participants for participating in this research survey. You may find that some questions will make you uncomfortable to answer. You are free not to answer those questions and to move on to the next questions. All study results will be reported without identifying your name or any way to identify you, so that no one viewing the results will ever be able to match you with your responses.

Benefit: There will be no costs for participating; you will receive the sum of N1000 Naira (Nigerian currency) equivalent of \$3 dollar upon completion of the questionnaire.

Confidentiality: Your responses will be treated as confidential and all reasonable efforts will be made so that no individual participants will be identified with his/her answers. You will be asked to provide your name, voluntarily, so that the researcher may wish to invite you to participate in a follow up interview or focus group session. The researcher will remove your identifying information immediately after the data collection is completed and no name will be reported during the process of data transcription, coding and analysis and the final result of the study. The hardcopies of data generated from this study, including the questionnaire, memos, notes etc. will be secured in personal briefcase locked and keyed while the electronic copies stored on a personal MacBook laptop computer during the study and immediately transferred to a desktop computer allocated to me by the University of Wisconsin-Milwaukee. The data stored will be password protected. Only 2 people, the Professor/Adviser and I, will have access to data located in a locked office of the university campus. The data will be kept for up to 9 months after the study is completed and then the data will be destroyed. However, the Institutional Review Board (IRB) at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study’s records.

Contact Information on the Study

For more information about the study or study procedures, contact the student Principal Investigator Musa Hassan at mobile number 08030841260.

Participants Right

In accordance to ethical policy to protect human subjects, your participation in this study is voluntary and you are free to withdraw at any time without penalty. You are free not to answer any question. Furthermore, if you have any questions or complaints about your treatment, you may contact the Nigerian Institute for Trypanosomiasis Research NITR No 1 Surame Rooda PMB 2077 Kaduna 234 8096081554, 234 7053533336 or Kaduna State Ministry of Health Independence Way PMB 2014 Kaduna Nigeria or you may speak to any IRB representative in English at the University of Wisconsin-Milwaukee Institutional Review Board at 009 1 414 229 3173 or email your concern to irbinfo@uwm.edu.

Research Subject’s Consent to Participate in Research:

By signing this form below, you acknowledge that you have read, understood and agree to the above statement and consent to participate in the survey.

Printed Name of Subject/Legally Authorized Representative

Signature of Subject/Legally Authorized Representative

Date

Thank you

QUESTIONNAIRE

Personal information:

1. Gender (a) Male. (b) Female.
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2. Ethnicity:
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3. Age range (a) 18-30 (b) 31-40 (c) 41-50 (d) 51-60 (e) 60 and above.
4. What is your educational level
.....
5. In which language do you prefer to obtain your health information?
Arabic
Fulfulde
Hausa
Other (please specify)
.....

Tsetse Fly Diseases

6. What do you know about the tsetse fly?
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7. What types of information do you need related to the tsetse fly? Why

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8. Who do you go to for help or what resource(s) do you use to find the information you need related to the tsetse fly?

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9. Have you looked for health-related information about the bite of the tsetse fly? If NO go to question No. 13

(a) Yes ____ (b) No ____

10. If you responded “Yes”, please explain the situation/circumstance that prompted your information search on the tsetse fly.

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11. What information did you look for on diseases that are caused by a tsetse fly bite?

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12. How did you become aware of the information sources you consulted on diseases that are caused by a tsetse fly bite and who did you go to for help?

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Malaria

13. What do you know about the mosquito?

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14. What types of information do you need related to the mosquito? Why?

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15. Who do you go to for help or what resource(s) do you use to find the information you need related to the mosquito?

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16. Have you looked for health-related information about the bite of the mosquito? If NO go to question No. 20

(b) Yes ___ (b) No ___

17. If you responded “Yes”, please explain the situation/circumstance that prompted your information search on the mosquito.

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18. What information did you look for on diseases that are caused by a mosquito bite?

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19. How did you become aware of the information sources you consulted on diseases that are caused by a mosquito bite and who did you go to for help?

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General Health Information Searching

20. For what reasons do you look for other health-related information than the topics above? .
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21. When you need health information, what kinds of information do you usually look for?
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22. What was the topic of your most recent health-related information-seeking activity?

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23. Please choose which of the following sources you use to find health information (select all that apply)

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|------------------------------|---------------------------------------|
| Health professional | Media source (Radio/Newspaper/TV etc. |
| Health care centers | Town Hall Meeting |
| Schools | Orientation |
| Computer/Library | Religious place of worship |
| Other (please specify) | |
| | |

Please elaborate.
.....

24. Do you use electronic devices or the Internet for your health information seeking?
Yes No

25. If so, what kind of electronic devices do you use for health information seeking? (select all that apply)

Desktop computer

Laptops

Smartphone

Other (please specify)

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26. Have you ever approached a health professional to help you with the health information you need? Please elaborate

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27. How much time do you spend looking for health information?

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28. Do you find it difficult to find the health information you need? Please elaborate.

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29. In general, how satisfied are you with the health information you obtain?

- (a) Extremely satisfied
- (b) Very satisfied
- (c) Moderately satisfied
- (d) Slightly satisfied
- (e) Not at all satisfied

31. If public access to health information is widely available to the general public in your area,
how often would you use them to look for information?

Frequently Occasionally Not at all

30. Are there any kinds of health information which might have helped you, but which you
found difficult to obtain?

(a) YES (b) NO

31. If YES, please provide details of the kinds of health information you found difficult to obtain

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32. How important do you believe that access to accurate and unbiased health information is for your own wellbeing as a citizen?

(a) Very Important (b) Somewhat Important (c) Not Important (d) I Don't Know

33. Why?

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.....

Thank you very much for your cooperation

Additional Participants Recruitment Request

Interview

ASSALAMU ALAIKUM WARAHMATULLAH

(Peace and Blessing be upon to you all) Islamic greeting

Thank you for your earlier participation in my dissertation study's questionnaire. I would like to invite you to participate also in an interview session. In this interview, I will ask you some questions associated with your knowledge of the Tsetse fly and Mosquito and about some of your health information needs, and the seeking process and searching behaviors you engage in. The interview is expected to take about 10 to 15 minutes of your time to answer the questions. Interviews may take place in Mosques or a private room in this building or at another location convenient for you. Questions will be limited to your health information needs and how you look for information. The interview session will be audio recorded, but your identity will be kept confidential. In appreciation for your time and participation, you will receive an individual gift card of N1000 Naira at the end of each part of the study in which you participate. If you are interested in participating, please submit your name to me so that we may schedule the interview session at a convenient time for you.

Thank you.

Musa Dauda Hassan (Student Investigator)

University of Wisconsin – Milwaukee
Consent to Participate in Interview Research

Introduction

Thank you for agreeing to participate in this survey. My name is **Musa Dauda Hassan**. I am responsible for conducting this research study as part of the fulfillment of the Doctoral program in Information Studies. The Title of my study is “Consumer Health Information Needs, Seeking and Searching Behavior on Selected Vector-Borne Diseases by Rural Residents in the Kachia Grazing Reserve (KGR), Nigeria”

Study Description: The purpose of this study is to better understand how you are engaging in health information needs, seeking and searching behavior, specifically related to diseases in your community associated with the Tsetse fly and Mosquito. In this interview, I will ask you some questions associated with your knowledge of the Tsetse fly and Mosquito and about some of your health information needs, and the seeking process and searching behaviors you engage in. You must be 18 years or above at the time of the study. The interview is expected to take about 10 to 15 minutes of your time to answer the questions. Also, some pictures will be taken of the village during the exercise, but not of you as a participant. Similarly, to help make sure that I have an accurate record of the interview session, I will record our conversation using an audio recorder. Only I will have access to the recorded conversation, and it will be destroyed after it has been reviewed and written out. During the interview, I may take notes to make sure I ask everyone the same questions and I may jot down some important facts to remember. To add more details of explanation to your answer, I may ask more questions to help me understand what you said.

Risks: There is no risk to the participants for participating in this research interview. However, during the interview you may feel uncomfortable answering some questions. If this happens, you are free to withdraw from the study or you may decide not to answer any questions you choose. All study results will be reported without identifying names or other forms of identity, so that no one viewing the results will ever be able to match you with your responses.

Benefit: There will be no costs for participating; you will receive the sum of N1000 Naira (Nigerian currency) equivalent of \$3 dollar upon completion of the interview.

Confidentiality: Your responses will be treated as confidential and all reasonable efforts will be made so that no individual participants will be identified with his/her answers as no name will be identify or reported during the process of interview, data transcription, coding and the analysis and the final result of the study. The hardcopies of data generated from this study, including the memos, notes etc. will be secure in a personal iron made briefcase locked and keyed while the recorded electronic script of the interview session will be stored on a personal MacBook laptop computer

during the study and immediately transferred to a desktop computer allocated to me by the University of Wisconsin-Milwaukee. The data stored will be password protected. Only 2 people, my major professor and I, will have access to data located in a locked office of the university campus. The data will be kept for up to 9 months after the study is completed and then the data will be destroyed. However, the Institutional Review Board (IRB) at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study's records.

Contact Information on the Study

For more information about the study or study procedures, contact student Principal Investigator Musa Hassan at mobile number 08030841260.

Participants Right

In accordance to ethical policy to protect human subjects your participation in this study is voluntary, and you are free to withdraw at any time without penalty. You are free not to answer any questions. Furthermore if you have any question or complaints about your treatment, contact the Nigerian Institute for Trypanosomiasis Research NITR No 1 Surame Rooda PMB 2077 Kaduna 234 8096081554, 234 7053533336 or the Kaduna State Ministry of Health Independence Way PMB 2014 Kaduna Nigeria or you may communicate with a representative in English at the University of Wisconsin-Milwaukee Institutional Review Board at 009 1 414 229 3173 or irbinfo@uwm.edu.

Research Subject's Consent to Participate in Research:

By signing this form below you acknowledge that you have read, understood and agree of the above statement and consent to participate in the Interview.

.

Printed Name of Subject/Legally Authorized Representative

Signature of Subject/Legally Authorized Representative

Date

Thank you

Semi Structured Interview Protocol

Do you have any questions before we start?

What types of general health information do you need?

What types of health information do you need on the tsetse fly (trypanosomiasis) and the mosquito (malaria)?

Have you ever looked for information about a health topic either for yourself or for someone else?

If yes, what types of health information do you search for?

Try to figure out if they got the information they needed and any people or items they consulted in the process. Also try to determine where they went for the information, or ask about it, if it is not volunteered. Ask specifically about information related to Trypanosomiasis and malaria if they do not volunteer it.

Tell me what you know about the tsetse fly and mosquito and the diseases they carry (e.g., trypanosomiasis, malaria).

How did you learn this?

How would you rate your ability to look for and use health information you found on diseases caused by the tsetse fly and mosquito? (If they are not specific)

When you hear or read about remedies or treatments about these diseases, do you use them? Why?

In general, how much do you trust the information sources about health information you consulted? Why?

With reference to the results or findings of your most recent search for health information about diseases caused by the tsetse fly or mosquito, do you agree or disagree that it took a lot of effort to get the information you needed. Please explain why.

Who do you go to for help or what resource(s) do you use to find the health information you need?
(If they don't talk about people or items, prompt them to see if they talked to people and/or used specific items.)

Do you think the information sources you have access to are suitable to address your information needs?

If someone asked you how to find information about diseases caused by the tsetse fly and mosquito, where would you send that person? Why?

What is your biggest concern about your health information-seeking activities?

What are the difficulties you have encountered when engaging in health information seeking?

Thank you very much for your cooperation

Additional Participants Recruitment Request

Focus Group

ASSALAMU ALAIKUM WARAHMATULLAH

(Peace and Blessing be upon to you all) Islamic greeting

Thank you for your earlier participation in my dissertation study's questionnaire. I would like to invite you to participate also in a focus group session. This focus group is intended ask you some questions in a group form about some of your health information needs, and the seeking process and searching behaviors you engage in. The focus group discussion is expected to take about 45 to 60 minutes of your time. The focus group session will take place at some point in time after the questionnaire. Sessions may take place in Mosques or a private room in this building or at another location convenient for you. Questions will be limited to your health information needs and how you look for information. The focus group session will be audio recorded, but your identity will be kept confidential. In appreciation for your time and participation, you will receive an individual gift card of N1000 Naira at the end of the focus group session. If you are interested in participating, please submit your name to me so that we may schedule the focus group session at a convenient time for you.

Thank you

Musa Dauda Hassan (Student Investigator)

University of Wisconsin – Milwaukee

Consent to Participate in Focus Group Research

Introduction

Thank you for agreeing to participate in this survey. My name is **Musa Dauda Hassan**. I am responsible for conducting this research study as part of the fulfillment of the Doctoral program in Information Studies. The Title of my study is “Consumer Health Information Needs, Seeking and Searching Behavior on Selected Vector-Borne Diseases by Rural Residents in the Kachia Grazing Reserve (KGR), Nigeria”

Study Description: The purpose of this study is to better understand your health information needs and how you are engaging in information-seeking and searching behavior, specifically related to diseases associated with the Tsetse fly and Mosquito in your community. This discussion group is intended ask you some questions in a group form about some of your health information needs, and the seeking process and searching behaviors you engage in. You must be 18 years or above at the time of the study. It is expected that it will take about 45 to 60 minutes of your time during the discussions. To help make sure that I have an accurate record of the discussion’s session. I will record our conversation using an audio recorder. Only I will have access to the recorded conversation, and it will be destroyed after it has been reviewed and written out. Also, some pictures will be taken of the village during the exercise, but not of you as a participant. Likewise, during the session I may take notes to make sure I jot down some important facts to remember.

Risks: There is no risk to the participants for participating in this research study. Possibly during the focus group discussion, you may experience some questions that will make you uncomfortable to answer, or any member of the discussion group may unintentionally utter some words or statements, which are sensitive that may trigger emotional discomfort. If that occurs, you are free to withdraw at any time or you may decide not to answer any questions you choose. I will do my best to protect each participant from discomfort and emotional stress.

Benefit: There will be no costs for participating; you will receive the sum of N1000 Naira (Nigerian currency) equivalent of \$3 dollar upon completion of the focus group session.

Confidentiality: Your responses will be treated as confidential and all reasonable efforts will be made so that no individual participants will be identified with his/her answers. You will be assigned a different name than your own for the sake the focus group session. The names are in no way connected to original participants name but will only be used for easy communication during the focus group session. I will later remove the anonymous identifier after the data had been transcribed, coded and the final results reported. The hardcopies of data generated from this study including the, memos, notes etc. will be secured in a personal iron made briefcase, locked and keyed, while the recorded electronic script of the of the discussion session will be stored on a personal MacBook laptop computer during the study and immediately transferred to a desktop computer allocated to me by the University of Wisconsin-Milwaukee. The data stored will be

password protected. Only 2 people, my major professor and I, will have access to the data located in a locked office on the university campus. The data will be kept for up to 9 months after the study is completed and the data will be destroyed. However, the Institutional Review Board (IRB) at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study's records.

Contact Information on the Study

For more information about the study or study procedures, contact student Principal Investigator Musa Hassan at mobile number 08030841260.

Participants Right

In accordance to ethical policy to protect human subjects your participation in this study is voluntary and you are free to withdraw at any time without penalty. You are free not to answer any questions. Furthermore if you have any question or complaints about your treatment contact the Nigerian Institute for Trypanosomiasis Research NITR No 1 Surame Roada PMB 2077 Kaduna 234 8096081554, 234 7053533336 or the Kaduna State Ministry of Health Independence Way PMB 2014 Kaduna Nigeria, or you may communicate with a representative in English at the University of Wisconsin-Milwaukee Institutional Review Board at 009 1 414 229 3173 or irbinfo@uwm.edu.

Research Subject's Consent to Participate in Research:

By signing this form below you acknowledge that you have read, understood and agree of the above statement and consent to participate in the focus group discussion.

Printed Name of Subject/Legally Authorized Representative

Signature of Subject/Legally Authorized Representative

Date

Thank you

Do you have any questions before we begin?

First round (briefly explain what Information search is) followed by an introduction from participants (tell them to call themselves whatever they like, using a first name or a name they make up instead) and their view in relationship with information needs seeking and use.

I will first of all briefly explain what health information need, seeking and searching are.

Second round

(To all participants): What are your general health information needs? How do you look for this information?

Third round

(To all participants): What do you know about diseases caused by the tsetse fly or mosquito? How did you learn this?

Fourth round

(To all participants): How do you go about searching for information about diseases caused by the tsetse fly and mosquito?

What sources do you use to find information about these diseases? (define sources, if needed, and be sure to let participants know that people can be sources)

Fifth round

(To all participants): What problems, if any, did you encounter when trying to find health information related to diseases caused by the tsetse fly or mosquito? Were you able to find answers to the questions you had when you started your research, or did you give up?

Last round

(To all participants): Is there anything you would like to add before we finish?

TAKARDAR NEMAN IZINI HALARTAR BINCIKE AMSA TAMBAYOYI
(Questionnaire consent)

Assalamu Alaikum WarahmatulLah

Nagode kwarai da amsa gayyata na don bincike dana ke aiwatarwa. Sunana Musa Dauda Hassan dalibine a jami'ar Wisconsin da ke garin Milwaukee a kasar Amurka don koyon ilimin sarafa bayanai don neman digirin digirgir (PhD) a fanin ilimin bayani. Bincike na ya kunshi "Sanin yadda mazauna garin gandun daji Ladduga suke ma'amalla wajen tattara bayanai dazai iya tamaka masu nayau da kullum ta fuskar ciwon da kudan tsando da sauro ke haifarwa". Makasudin wannan bincike shine do sanin zahiri hakikanin abunda alumma laduga suke bukata ta fuskar bayanai nayau da kullam sanadiya lalura ko rashin lafiya wanda kudan tsando da sauro ke haifarwa. A bangaren wanan bincike zan baka takarda wanda take kunshe da tambayoyi wanda nake neman ka amsa. Ba wani hakikanin matsala dangane da amsa wadanan tambayoyi sai de kila zaka iya cin karo da wasu tambayoyi suyi maka bambarakwai ko tsaurin amsawa, kana da dama amsa ko kin amsa tambayar da duk kaga dama bai zama DOLE ka amsa kowace tambaya ba. Bawani kabbantacen kudi daza a baka don shiga wannan bincike, sai dai na tanaji dan ihisani na akala Nera N1000 da zan baka bayan gama amasa tambayoyin.

Dukk bayannan da zaka bada akwai tabbacin kiyaye sirin duk abin daka fada, duk abinda ka fada ya kebanta ne kawai don wanan bincike. Har ila yau bincike ba zai anfani da suna, ko lakabi ko wani abu makamancin haka ba wanda zai nuna kai waye dangane da bayanan da ka bada. Duk

bayanan da ka bada za a kiyaye su a wuri na sirri a cikin komfuta wanda ni kadai ke da ikon anfani dashi har tsawon akalla kimanin tsawon wata 9 sa'anan za a kona duk takardu daka bada amasa bayan na fidda mahimman bayanan da binciken kenema.

Hukumar jami'a Wisconsin dake Milwaukee ko ofishin kula da hakin al'umma ta bangaren bincike makamanchin irin wanan na da dama duba bayanan don tambatar da anyi daidai wajen kula da hakin alumma dangane da binciken. Domin karin bayani game da wanan bincike ko wani koke kana iya tuntuban ofishin kula da binciken kimiyan cutar kudan tsando watau NITR dake No 1 Surame road Unguwan Rimi Kaduna ko Hukumar Lafiya to Jihar Kaduna wanda ke kan titin Independence daura da babbar sakateriar jihar kaduna ko kiran waya don yin magana da wani jami'i a harshen turanchi dake Jami'ar Wisconsin dake Milwaukee akan lambar tarho + 1 414 229 3173 tsakanin karfe 8 zuwa 4 anfani da tsarin lokacin garin Chicago.

In ka yarda da duk abinda na fada sai ka sa hannu da suna a kasa don tabbatar ma hukumar kare yancin dan adam ta fanin bincike, sanin cewa da yardar ka na yi wanna binciken. Nagode

Cikakken Suna da na Mahaifi

Kwanan Wata

TSARIN TAMBOYOYIN AMSAWA A RUBUCE

(Questionnaire)

TAMBAYOYI DANGANE DA KAI

1. Jinsin Haihuwa (a) Namiji (b) Mace
.....
2. Kabila
.....
3. Tsarin shekuru (tsakanini shekara zabi wanda ya dace da kai)
a) 18-30 (b) 31-40 (c) 41-50 (d) 51-60
(e) 60 zuwa sama
4. Menene matakin Ilimin ka?.....
5. A wane yare kake neman bayanai daya danganchi kiwon ko rashin lafiyar ka?
(a) Arabic (b) Fulfulde (c) Hausa
.....
(d) Wani (Yaren)
.....

TAMBAYOYI DAN GANE DA KUDAN TSANDO

6. Me kasani dan gane da kudan tsando?
7. Wane ire iren bayanai kake ko kafi bukata dangane da kudan tsando? Me yasa?

8. Wece hanya dakuma wajen wakaje don neman taimako dangane da bayanan da kake nema game da kudan tsando?

9. Shin ko ka taba neman bayanai da yashafi chizon da kudan tsando ya haifar? Idan a'a sai ka tsallake sauran tambayoyin ka cigaba da amsa tambaya ta 13
 - (a) Ey
 - (b) A'a

10. Idan harka amsa tambaya chizon da kudan tsando ya haifar, shin ko zaka iya karamin bayani gamsashe akan turbar da kabi don neman bayanai dangane kudan tsando?

11. Wane irin bayanai ka nema dangane da cutar da cizon kudan tsando ke haifarwa?

12. Tayaya kasan hanyoyi samun bayanai dangane cutar da kudan tsando ke haifarwa? Kuma wane waje kaje don samun taimakon?

TAMBAYOYI DAN GANE DA SAURO

13. Me kasani dangane da sauro?

14. Wane ire iren bayanai kake ko kafi bukata dangane da Sauro? Me yasa?

15. Wece hanya dakuma wajen wakaje don neman taimako dangane da bayanan da kake nema game da sauro?

16. Shin ko ka taba neman bayanai da yashafi cutar da zazzabin chizon sauro ya haifar? Idan a'a sai ka tsallake sauran tambayoyin ka cigaba da amsa tambaya ta 20
 - (a) Ey
 - (b) a'a

17. Idan harka amsa tambaya da chizon sauro ke haifarwa, shin ko z aka iya karamin bayani gamsashe akan turbar ko yanya da kabi don neman bayanai dangane cuttar da zazabin sauro ya haifar?

18. Wane irin bayanai ka nema dangane da cutar da cizon sauro ke haifarwa?

19. Tayaya kasan hanyoyi samun bayanai dangagane cutar da sauron ke haifarwa? Kuma wane waje kaje don samun taimakon?

SAURON TAMBOYOYI DA SUKA SHAFI KIWO KO RASHIN LAFIYA

20. Wane dalilai ne ya baka kwarin guiwa don neman bayanai da suka shafi kiwo ko rashin lafiyar ka?

21. A dukk lokacin da kake naman bayanan, wane irin bayani taka maimai kafi bukata?

22. Wane al'amari ko matsala ta rashin lafiya ko cuta ne na kwana kwana nan nan dangane da rashin lafiya ka ko na wanin ka kayi bincike akan shi?

23. Ko zaka iya zaba a cikin jeri na kasa wane hanyoyi kake bi don samun bayanai (kana iya zaban duk wanda yayi daidai sama da daya)

- (a) Jami'in lafiya
 - (b) Kafofin yada labarai (gidan redio, talbijin, ko jarida)
 - (c) Asibitochi
 - (d) Dakin taro ko masarauta
 - (e) Makaranta
 - (f) Taron wayar da kai
 - (g) Yin amfani da komfuta
 - (h) Dakin karatu
 - (i) Wajen ibada (masallachi)
 - (j) Wani (wanda ba a fada sama ba)
-

24. Shin ko ka taba tuntubar jami'in kiwon lafiya do ya taimaka maka da bayanai akan kiwo ko rashin lafiyar ka?

25. Har tsawon lokaci nawa ka shafe don neman bayanan?

26. Shin ko ka fuskanchi wasu matsaloli wajen neman bayanai da kake nema? Kara mani bayin gamsashe?

27. Gaba daya taya zaka iya auna nasara ko rashin nasaran ka a hanyar neman bayanai da suka danganci kiwo ko rashin lafiyar ka?

- (a) Cikkaken Nasara (b) Nasara takaitaciyya
(c) Ba yabo ba fallasa (e) Ban samu cikkaken bayanai gamsasu ba
(f) Ban yi nasara samun kofi ba

28. Idan da za a samar da hanyoyin samar da bayanai da ya danganci kiwo ko rashin lafiyar ka a wuraren da mutane ke hada hada a saukake a inda kake, shin sau nawa kake gani zaka nemi bayanai? Ka zaba wanda yadace ma.

Koyaushe Lokachi Lokachi Bana bukatar zuwa

29. Shin ko kana da wani bayanai daka nenema dangane da Ilimin kiwon ko rashin lafiyar ka ko na wanin ka wanda har yanze yayi wuya baka samu ba?

- (a) Ey (b) a'a

30. In haka ne, wane irin bayanai ne da ka nema dangane da kiwo ko rashin lafiya baka samu ba?

31. A karshe me zakache dan gane da samun ingantaccen bayanai da suka shafi kiwo da rashin lafiyar mutane a matsayin ginshiki don ci gaban al'umma? Zabi wanda ya dace maka

- (a) Yana da matukar anfani (b) Yana da afani amma ba chan chan ba
(c) Bai da anfani (d) Ban san me zan che ba

32. Kara bayani me yasa (game da binda ka zaba a sama)?

NAGODE

طَارِنْ تَمْبِيُونِ اَمَسَاوَا ءَ رُبُوْثِي

(QUESTIONNAIRE)

بَيَانِنْ مَيِ اَمَسَاوَا.

1. جِنْسِي: (أ) نَمَجِي. (ب) مَثِي.
 2. قَبِيْلَا / :
 3. رُكْنِنْ شِيكْرُوَا:
 - (أ) 18-30. (ب) 31-40. (ج) 41-50. (د) 51-60. (ح) 60- زُو
- سَمَا.

4. مَتَاكِنْ اِلْمِي؟
5. دَوْتِي يَارِي ك/ك كَكِي نِيْمَا بِيَانِي اَكَنْ كِيُونُ لَافِيْرَكْ؟
- (أ) لَارَبْثِي (ب) فِلَاتَنْثِي. (ج) هُوَسَا. (د) تُورَنْثِي. (ح) وَنِ يَارَنْ

تَمْبَايُوِي دَنْغِي دَقْدَنْ - ظَنْدُو

6. مَيِ كِ سَنْ غَمِي دَقْدَنْ-ظَنْدُو؟
7. (أ) مَيِ ك/ك سُو ك/ك سَنِي غَمِي دَقْدَنْ - ظَنْدُو؟
8. (ب) مَيِ يَسَا؟

9. أَيْنَا؟ كَمَّ تَيَايَا كَكِي سَامُنْ بَيَانِي غَعِي دَ قُدْنُ - ظَنُدُو؟

10. شِنُ ك/ك تَبَا سَامُنْ بَيَانِي دَنُ غَعِي دَ ثَوْتَرُ دَ ثِيْرُنُ قُدْنُ ظَنُدُو يَكِي هَيْفَرُوَا؟
إِدْنُ ءَاءَ نَى، طَلَّكِي تَمْبِيُوِيْنُ دَكِي تَفِي كَ ثِغَبَ دَ أَمْسَ تَمْبِيَا تَ غُوْمَ شَا بِيْرُ (15).
(أ) أَي. (ب) ءَاءَ

11. إِدْنُ كَا أَمْسَ تَمْبِيْرُ، كِي ثِكْكَنُ بَيَانِي ءَ غَعِي دَ تُرْبِرُ دَ كَبِ وَجَنُ سَامُنُ
بَيَانُنُ:

12. وَنَى إِرْنُ بَيَانِي كَ نِيْمَا غَعِي دَ ثَوْتَرُ دَ ثِيْرُنُ قُدْنُ - ظَنُدُو يَكِي هَيْفَرُوَا؟

13. وَطَنِي هَنْيُوِي كَبِ دُوْمِنُ تَارَ بَيَانِي أَكْنُ ثَوْتَرُ دَ ثِيْرُنُ قُدْنُ - ظَنُدُو يَكِي هَيْفَرُوَا؟

14. كَمَّ إِنَا كَجِي دُوْمِنُ نِيْمَنُ تِيْمَكُوَا أَكْنُ هَكْنُ؟

.....
.....
تَمْبِيُوي دَنْ غَنِي دَ سَوُرُو

.....
.....
15. مَيِ كَ / كِ سَنِ غَمِي دَ سَوُرُو.....

16. وَطَنِي إِزْ – إِزْنُ بَيَانِي كَ / كِ فِ بُقَاتَا دَنْ غَنِي دَ

.....
.....
سَوُرُو؟

.....
.....
كُم مَيِ يَسَا؟

.....
.....
17. أَئِنَّا؟ كُم تَيَايَا كَكِي سَامْنُ بَيَانِي غَمِي دَ سَوُرُو؟

.....
.....
18. شِنْ كَا تَبَا سَامْنُ بَيَانِي دَنْغَنِي دَ ثُوْتَرُ دَ ثِيْرُنُ سَوُرُو يَكِي هَيْفَرُوَا؟ إِدَنْ

ءَاءَ نِي، طَلَكِي تَمْبِيُويْنُ دَكِي تَفِي كَ ثَغَبَ دَ أَمْسَ تَمْبِيَا تَ أَشْرِنُ دَ بِي (22)

(أ) إِي. (ب) ءَاء.

.....
.....
19. إِدَنْ كَا أَمْسَ تَمْبِيْرُ، كِي ثِكْكَنُ بَيَانِي ءَ غَمِي دَ ثُرْبَرُ دَ كَبِ وَجَنْ سَامْنُ

.....
.....
بَيَانُنُ.....

.....
.....
20. وَتِي إِزْنُ بَيَانِي كَ نَيْمًا غَمِي دَ ثُوْتَرُ دَ ثِيْرُنُ سَوُرُو يَكِي

.....
.....
هَيْفَرُوَا؟

21. وَتِي هَنِيَا كَبِ دُومِنُ تَارَ بِيَانِي أَكْنُ تُوتَرُ دَ ثِيْرُنُ سَوْرُو يَكِي
هَيْفَرُوَا؟.....

سَوْرُنُ تَمْبَايُوِي دَ سَكَّ شَافِ كُلاَدَ لَافِيَا كُورَشِنْتَا
22. وَتِي دَلِيْلِي نِي يِي بَاكُ فُوَارِنُ غِيُوَا دَنُ نِيْمَنُ بِيَانِي دَ سَكَّ شَافِ كُلاَدَ لَافِيَا /
رَشِنْتَا؟.....

23. أَدْكَ لُوكَنُ دَ كَكِي نِيْمَنُ بِيَانِي وَتِي إِرِ كَفِ بُقَاتَا؟

24. وَتِي أَلْمَرِي كُو مَطَلَاتَ رَشِنُ لَافِيَا كُو تُوتَا كَ سَامُ لَابَارِنْتَا كُوَانُ
كُوَانُنُ نُنُ، كَمَا كِي بِنْتِكِي أَكْنْتَا؟

25. ك/كَ زَابَا أَثِكِنُ وَطَنُنُ جَيْرُنُ هَنِيُوِي دَ كَكِي بِي دُومِنُ تُنْتَبِنُ جَامُونُ كُلاَدَ دَ
لَافِيَا. (كَ إِيَا زَابُنُ أَمْسَ فِي دَ طِيَا)

(أ) جَامُونُ كُلاَدَ لَافِيَا.

(ب) كَفُوفِنُ يَاطَ لَابَارِي (رِيْدِيُو، تَلْبَجِنُ، كُو جَرِيْدَ

(ت) أَسِبْتُوِي.

(ث) طَاكِنُ تَارُو كُو مَسْرُوْتَا.

(ج) مَكْرِنْتَا.

(ح) تَارُونُ وَآيِرُ دَ كِي.

(خ) يِنُ أَنْفَانِي دَ كُنْفِيوَتَا.

(د) طَاكِنُ كَرَاتُو.

(ذ) وَجَنُ إِبَادَا (مَسَلَاثِي)

(ر) وَنِ (وُنْدَ بَاءَ فَطَا بَ)

26. شِنُ كُو كَا تَبَ تُنْتَبِرُ جَامُونُ كِيُونُ لَافِيَا دُنُ سُو تِيْمَكَا مَكْ دَ بِيَانِي أَكْنُ

كُلَا دَ لَافِيَا كُو

رَشْنَتَ؟

.....

27. طَوْنُ وَتِي لُوَكْثِي كَكِي طَوْكََا دُنُ نِيْمَنُ بِيَانِي؟

(أ) مِنْتِ (1-10) (ب) مِنْتِ 11-20. (ج) كُوَانَا 1 – 7.

28. كُو كَا فُسْكَنْثِي وَسُو مَطْلُولِي وَجَنُ بِيَانِنُ دَ كَكِي نِيْمَا؟

ي بِيَانِي غَمْسَسْثِي أَكْنُ هَكَا.

.....

.....

.....

..

29. تَ يَآيَ زَاكَ إِيَ أُونُ نَسْرَزْكَ بَسَا نِيْمَنُ بِيَانِي دَ كِي دَ سُكْ شَافِ كُلَا دَ

لَافِيَرُ؟ زَابَ طِي أَثِكْنُ أَبْنَدَ كِي تَفِي:

(أ) ثِكْكَيَرُ نَسْرَا.

(ب) تَقِيْتَيِّرَ نَسْرَا.

(ت) بَابُ يَبُو بَا فَلَسَا.

(ث) بِنُ سَامُ ثِكْغَنُ بِيَانِي غَمْسَسُو ب.

(ج) بِنُ سَامُ نَسْرَرُ سَامُنُ كُومِي ب.

30. إِدْنُ زَاءَ نِيَمَ بِيَانِي دِي دَنْغَنْثِ كُلاَ دَ لَافِيَا أُورَارُنُ دَ مُتَانِي كِي هَدَا - هَدَا

ءَ سَوَقَقِي ءَ إِندَ كَكِي، شِنُ سَوُ نَوُ كَكِي غَنِي زَاكَ نِيَمَ بِيَانِي؟ كَ زَابَ وَنَدَ

ي دَائِي.

(أ) كُويُوشِي.

(ب) لُوكِي - لُوكِي.

(ت) بَانَ بُقَاتَرُ زُوَا.

31. شِنُ كُوكِنَادَ وَنِي بِيَانِ دَنْ غَنِي دَ وَتَ ثُوتَا دَتَ سَامُ وَنِ هَرُ يَنْزُ بَاءَ سَامُ

مَاغْنِنْتَ بَ؟

(أ) إِيْ. (ب) ءَا ءَ.

32. إِدْنُ هَرُ هَكَانِي، وَنِي مَتَاكِي كَ طَوُكُ دُومِنُ كُلاَ دَ

لَافِيرُكُ؟.....

33. أَقْرَشِي مِي زَاكَ إِيْ ثِيوَا دَنْ مُتَانِي سُ كُلاَ دَ لَافِيرُ سُ؟

34. زَابَ وَنَدِي دَائِي دَكِي أَثِكِنُ أَبُوبُونُ دَكِي تَفِي:

(أ) يَنَادُ مَتَّقِرُ أَنْفَانِي.

(ب) يَنَادُ أَنْفَانِي أُمَّ بَا سُوسِي بَ.

(ت) بَاشِ دَ أَنْفَانِي.

(ث) بَنَسْنُ مَي زَنْ تِي بَ.

35. قَارَ بَيَانِي أَكُنْ أَبْنَدَكَ زَاب:

.....
.....

نَا عُودِي.

iA

TAKARDAR NEMAN IZINI ZANTAWA DON AMSA TAMBAYOYI

(Interview consent)

Assalamu Alaikum WarahmatuLah

Nagode kwarai da amsa gayata na dangane da bincike dana ke aiwatarwa. Sunana Musa Dauda Hassan dalibine a jami'ar Wisconsin da ke garin Milwaukee a kasar Amurka don koyon ilimin sarafa bayanai don neman digirin digirgir (PhD) a fanin ilimin bayani. Bincike naya kunshi "Sanin yadda mazauna garin gandun daji Ladduga suke ma'amalla wajen tattara bayanai dazai iya tamaka masu nayau da kullum ta fuskar ciwon da kudan tsando da sauro ke haifarwa". Makasudin wannan bincike shine sanin zahiri hakikanin abunda alumma laduga suke bukata ta fuskar bayanai nayau da kullam a bisa sanadiya lalura ciwo ko rashin lafiya wanda kudan tsando ta sauro ke haifarwa. A bangaren wanan bincike zanyi maka tambayoyi kana bani amsa abinda kasani har ilau zan yi anfani da na'urar daukan magana don daukar hirar tamu wanda zai bani daman dauke daukan kowane mahimin amasa daka fada. Ba wani hakikanin matsala dangane da amsa wadanan tambayoyi, sai de kila zaka iya samun wasu daga cikin tambayoyi suyi maka bambarakwai ko tsaurin amsawa. Kana da dama amsa ko kin amsa tambayar da duk kaga dama bai zama DOLE ka amsa kowace tambaya ba. Bawani kabbantacen kudi daza a baka don shiga wannan bincike, sai dai na tanaji dan ihisani na akala Nera N1000 dazan baka bayan gama amsa tambayoyin.

Dukk bayannan da zaka bada akwai tabbacin kiyaye sirin duk abin daka fada, dukk abinda ka fada ya kebanta ne kawai don wanan bincike. Har ila yau bincike ba zai anfani da suna, ko lakabi ko wani abu makamancin haka da zai iya nuna kai waye dangane da bayanan da ka bada. Duk bayanan da ka bada za a kiyaye su a wuri na sirri a cikin komfuta wanda ni kadai ke da ikon anfani dashi har tsawon akalla kimanin tsawon wata 9 sa'anan daga bisani zan goge maganganu damu kayi bayan na fidda mahimman bayanan da bincike na kenema.

Hukumar jami'a Wisconsin dake Milwaukee ko ofishin kula da hakin al'umma ta bangaren bincike makamanchin irin wannan na da dama duba bayanan don tambatar da anyi daidai wajen kula da hakin alumma wajen binciken. Domin karin bayani game da wanan bincike ko wani koke kana iya tuntuban ofishin kula da binciken kimiyan cutar kudan tsando watau NITR dake No 1 Surame road Unguwan Rimi Kaduna ko Hukumar Lafiya to Jihar Kaduna wanda ke kan titin Independence daura da babar sakateriar jihar kaduna ko kiran way da yin magana da wani jami'i a harshen turanchi dake Jami'ar Wisconsin dake Milwaukee akan lambar tarho + 1 414 229 3173 tsakanin karfe 8 zuwa 4 anfani da tsarin lokacin garin Chicago.

In ka yarda da dukk abinda na fada sai ka sa hannu da suna a kasa don tabbatar ma hukumar kare yancin dan adam ta fanin bincike, sanin cewa da yardar ka na yi wanna hirar. Nagode

Cikakken Suna da na Mahaifi

Kwanan Wata

TSARIN TAMBOYOYIN ZANTAWA

(Interview)

Kamar yadda ka karanta a takardar yarjejeniya neman izini daman shiga bincikina game da wannan tattaunawa. Shin kona neman karin bayani ko tambaya kafin mu fara?

- a) Wane irin muhiman bayanai danga ne da lafiyar ka kafi bukata?
- b) Har ila yau wane irin bayanai da ya kebanchi illar cutar kudan tsando ko sauro ke haifarwa ka nema kwanan nan?
- c) Shin ko ka taba neman wani ko wasu bayannai akan wata matsala ta rashin lafiya game da kai ko wani naka?
- d) In ka taba wane iri ko ire iren ka nema (zan kokarin la'akari da yanyin da suka bi wajen nema bayanai, da kuma ina suka je wajen neman bayanan ko suwa suka tambaya. Zan takaita tambaya kachokan akan kudan tsando da suro)
- e) Gaya man me kasani gameda cututtukan da kudan tsando to sauro ke kawowa?
- f) Ta yaya kasan wadanan cututtukan?
- g) Meza ka iya cewa a bisa himmarka wajen binciken bayanai da suka shafi cututtukan da kudan tsando ko sauro ke kawowa ko suke sawa?
- h) Idan har kasami magani ko shawarwari a game da cututtukan da kudan tsando ko sauro ke kawo wa , shin kana anfani da shi? Me yasa ?
- i) Gaba daya me zaka ce game da sahihancin yanyar da kake samun bayani dangane da rashin lafiya ? kuma me yasa?
- j) Yin la'akari da muhiman bayanan da ka nema ko ka samu na kwana kwana na nan dangane da bincike neman sanin wasu al'amura danagane da kiwon lafiyaraka, ko akan

kudan tsando ko sauro, wane tsokaci zakayi game da sauki ko rashin saukin samun wadanan bayanai?

k) Ina kake zuwa ko kuma wane hanyoyi kake bi don samun bayanai akan kiwon lafiyarka?

TAKARDAR NEMAN IZINI HALARTAR TATTAUNAWA DON AMSA TAMBAYOYI

(Focus group consent)

Assalamu Alaikum WarahmatulLah

Nagode kwarai da amsa gayata na don bincike dana ke aiwatarwa. Sunana Musa Dauda Hassan dalibine a jami'ar Wisconsin da ke garin Milwaukee a kasar Amurka don koyon ilimin sarafa bayanai don neman digirin digirgir (PhD) a fanin ilimin bayani. Bincike na ya kunshi "Sanin yadda mazauna garin gandun dajin Ladduga suke ma'amalla wajen tattara bayanai dazai iya tamaka masu na yau da kullum ta fuskar ciwor kudan tsando da sauro ke haifarwa". Makasudin wannan bincike shine don sanin zahiri hakikanin abunda alumma laduga suke bukata ta fuskar bayanai nayau da kullam sanadiya laluran ciwo ko rashin lafiya da kudan tsando da sauro ke haifarwa. A bangaren wanan bincike kana daya daga cikin mutanen da za mu tattauna da kai zan maku tambayoyi kuna bani amsa abinda kuka sani har ilau zan yi anfani da na'urar daukan magana don daukar hirar tamu wanda zai bani dama daukan kowane mahimin amasa da masu tattaunawa suka fada. Ba wani hakikanin matsala dan gane da amsa wadanan tambayoyi sai de kila zaka iya samu wasu daga cikin tambayoyi suyi maka bambarakwai ko tsaurin amsawa, kana da dama amsa ko kin amsa tambayar da duk kaga dama bai zama DOLE ka amsa kowace tambaya ba. Bawani kabbantacen kudi daza a baka don shiga wannan bincike, sai dai na tanaji dan ihisani na akala Nera N1000.

Dukk bayannan da zaka bada akwai tabbacin kiyaye sirin duk abin daka fada, dukk abinda ka fada ya kebanta ne kawai don wanan bincike. Har ila yau bincike ba zai anfani da suna, ko lakabi ko

wani abu makamancin haka da zai nuna kai waye dangane da bayanan da ka bada. Duk bayanan da ka bada za a kiyaye su a wuri na sirri a cikin komfuta wanda ni kadai ke da ikon anfani dashi har tsawon akalla kimanin tsawon wata 9 sa'anan daga bisani zan goge maganganu damu kayi da ku bayan na fidda mahimman bayanan da bincike na kenema.

Hukumar jami'a Wisconsin dake Milwaukee ko ofishin kula da hakin al'umma ta bangaren bincike makamanchin irin wanan na da dama duba bayanan don tambatar da anyi daidai wajen kula da hakin alumma wajen binciken. Domin karin bayani game da wanan bincike ko wani koke kana iya tuntuban ofishin kula da binciken kimiyan cutar kudan tsando watau NITR dake No 1 Surame road Unguwan Rimi Kaduna ko Hukumar Lafiya to Jihar Kaduna wanda ke kan titin Independence daura da babar sakateriar jihar kaduna ko kiran waya don yin magana da wani jami'i a harshen turanchi dake Jami'ar Wisconsin dake Milwaukee akan lambar tarho + 1 414 229 3173 tsakanin karfe 8 zuwa 4 anfani da tsarin lokacin garin Chicago.

In ka yarda da dukk abinda na fada sai ka sa hannu da suna a kasa don tabbatar ma hukumar kare yancin dan adam ta fanin bincike, sanin cewa da yardar ka na yi wanna binciken. Nagode

Cikakken Suna da na Mahaifi

Kwanan Wata

TSARIN TAMBOYOYIN TATTAUNAWA

(Focus Group Discussion)

Shin kun gane bayanin dake kunshe a takarda neman izini tattauna, ko kuna da wata tambaya, kafin mu fara?

ZAGAYEN FARKO NA TATTATAUNAWA

- a) Zan yi takaccen bayani da kara haske akan mene ne “Information need, seeking and search” da kuma “health information seeking” sa’anan masu tattaunawa su gabatar da kawunan su wajen fadin sunayen su.

ZAGAYE NA BIYUN TATTAUNAWA

- b) Wadan ne irin bayanai kuke nema dangane da matsalolin da suka shafi muhiman al’amuran kiwon ko rashin lafiyar ku ko wanin ku?

ZAGAYE NA UKUN TATTAUNAWA.

- c) Me kuka sani dangane da cutar da kudan tsando da sauro ke kawowa? Kuma ta wacce hanya kuka san hakan?

ZAGAYE NA HUDUN TATTAUNAWA

- d) Taya ya ko wane dabara kuke bi don neman bayanain dangane da cutar da kudan tsando da sauro ke haifarwa?
- e) Wane hanyoyi kuke bi don samun bayanai?

ZAGAYE NA BIYAR DIN TATTAUNAWA.

- f) Wane matsaloli kuke fuskanta ko kukachi karo dasu a yayin da kuke neman bayanain da yashif kiwo da rashin lafiyarku ko na wanin ku, masaman abunda ya danganchi cutar kudan tsando ko sauro? Shin ko kun sami nasaran cimma burinku na neman ko a'a?

ZAGAYEN KARSHE TATTAUNAWA.

- g) Ko akwai wani abu daza ku kara haske akai wanda ban tambaya ba?

Nagode kwarai ALLAH yasaka da Alheri.

Appendix H: Overall summary of coding categories in NVivo

Ladugga Dissertation (November Restore) (NVivo 12).nvp - NVivo 12 Pro

File Home Import Create Explore Share

Paste Cut Copy Merge Clipboard

Properties Open Memo Link Item

Add To Set Create As Code Create As Cases

Query Visualize Code Auto Code Range Code Uncode

Case Classification File Classification

Detail View Sort By Undock Navigation List View Find Workspace

Nodes Search Project

Name	Files	Referenc	Created On	Created By	Modified On
Tsetse fly information searching process	14	35	8/17/2018 5:47 PM	MDH	11/11/2018 5:12 PM
Tsetse fly information	29	49	8/17/2018 5:43 PM	MDH	11/27/2018 5:37 PM
Resources used mosquito	19	32	8/17/2018 5:50 PM	MDH	11/27/2018 5:27 PM
Resource used	32	123	8/17/2018 5:45 PM	MDH	11/11/2018 5:13 PM
Recent Information	6	6	8/21/2018 11:43 AM	MDH	9/6/2018 5:55 PM
Recent helath information seeking	4	4	8/17/2018 6:06 PM	MDH	11/11/2018 5:16 PM
Reason of Information seeking	16	28	8/17/2018 5:49 PM	MDH	11/16/2019 7:09 PM
Public health information facilites	5	7	8/17/2018 6:06 PM	MDH	9/5/2018 4:24 PM
Mosquitor Information searching process	21	45	8/17/2018 5:57 PM	MDH	11/27/2018 5:33 PM
Mosquitor Information satisfaction	22	28	8/17/2018 6:05 PM	MDH	9/10/2018 3:00 PM
Mosquito Information	21	38	8/17/2018 5:48 PM	MDH	11/27/2018 5:26 PM
Information right	12	12	8/17/2018 6:07 PM	MDH	9/6/2018 5:52 PM
Information reliability	6	6	8/17/2018 5:53 PM	MDH	9/10/2018 12:15 PM
Information need	23	49	8/17/2018 5:44 PM	MDH	11/11/2018 5:22 PM
Health information	22	94	8/17/2018 5:59 PM	MDH	11/27/2018 5:35 PM
Duration of Information seeking	4	4	8/17/2018 6:03 PM	MDH	11/27/2018 5:35 PM
difficultties in information seeking	30	196	8/17/2018 6:03 PM	MDH	11/27/2018 5:37 PM
Comments	17	39	8/21/2018 11:43 AM	MDH	11/11/2018 5:21 PM
Appreciation	2	2	9/6/2018 4:31 PM	MDH	9/10/2018 11:59 AM

Quick Access: Files, Memos, Nodes

Data: Files (Focus group, Interview, Questionnaire), File Classifications, Externals

Codes: Nodes, Relationships, Relationship Types

Cases: Cases, Case Classifications

Notes

Search: Queries, Query Results, Node Matrices, Sets, Search Folders

Maps

Output

Ladugga Dissertation (November Restore) (NVivo 12).nvp - NVivo 12 Pro

File Home Import Create Explore Share

Paste Copy Merge Properties Open Memo Link Add To Set Create As Code Create As Cases Query Visualize Code Auto Code Range Code Uncode Case Classification File Classification Detail View Sort By Undock Navigation View List View Find

Clipboard Explore Coding Classification Workspace

Quick Access

- Files
- Memos
- Nodes

Data

- Files
 - Focus group
 - Interview
 - Questionnaire
- File Classifications
- Externals

Codes

- Nodes
- Relationships
- Relationship Types

Cases

- Cases
- Case Classifications

Notes

Search

Maps

Output

Nodes

Name	Files	Referen
Appreciation	2	2
Comments	17	39
difficulties in information seekin	30	196
Duration of Information seeking	4	4
Health information	22	94
Information need	23	49
Information reliability	6	6
Information right	12	12
Mosquito Information	21	38
Mosquitor Information satisfacti	22	28
Mosquitor Information searching	21	45
Public health information facilit	5	7
Recent helath information seekin	4	4
Recent Information	6	6
Reoson of Information seeking	16	28
Resource used	32	123
Resources used mosquito	19	32
Tsetse fly information	29	49
Tsetse fly information searching	14	35

Drag selection here to code to a new node

Resource used Reason of Information seeking

[<Files\Focus group\Youth> - \\$ 2 references coded \[1.95% Coverage\]](#)

Reference 1 - 1.61% Coverage

who was serve as bridge between the community and the agency to address some of our question, but this process is slower that excepted in response as the agent had to travelled to the city.

Reference 2 - 0.35% Coverage

since we don't have good drinking water

[<Files\Interview\Clowel> - \\$ 2 references coded \[2.21% Coverage\]](#)

Reference 1 - 0.87% Coverage

How to prevent my self and my family.

Reference 2 - 1.34% Coverage

I look for information for the treatment of these mosquito

[<Files\Interview\Deely> - \\$ 1 reference coded \[0.97% Coverage\]](#)

Reference 1 - 0.97% Coverage

How to protect my community and the my family.

[<Files\Interview\Qulock> - \\$ 1 reference coded \[2.58% Coverage\]](#)

Reference 1 - 2.58% Coverage

because hardly you many not found people sick on almost every day and our animal too as a result of tsetse fly.

[<Files\Questionnaire\Awole> - \\$ 1 reference coded \[1.87% Coverage\]](#)

Reference 1 - 1.87% Coverage

I need so much information related to mosquito because I need to prevent my self from the harmful effect it causes

[<Files\Questionnaire\Coop> - \\$ 1 reference coded \[3.68% Coverage\]](#)

Appendix I: Coding categories summary derived from the survey results in NVivo

Ladugga Dissertation (November Restore) (NVivo 12).nvp - NVivo 12 Pro

File Home Import Create Explore Share

Clipboard: Paste, Merge, Cut, Copy

Properties, Open, Memo Link, Add To Set, Create As Code, Create As Cases

Item

Explore: Query, Visualize

Coding: Code, Auto Code, Range Code, Uncode

Classification: Case Classification, File Classification

Workspace: Detail View, Sort By, Undock, Navigation View, List View, Find

Quick Access

- Files
- Memos
- Nodes

Data

- Files
 - Focus group
 - Interview
 - Questionnaire
- File Classifications
- Externals

Codes

- Nodes
- Relationships
- Relationship Types

Cases

- Cases
- Case Classifications

Notes

Search

Maps

Output

Questionnaire

Name	Codes	References	Modified On	Modified By
Awole	17	28	8/17/2018 6:14 PM	MDH
Bule	12	16	8/17/2018 5:28 PM	MDH
Coop	13	17	8/17/2018 5:28 PM	MDH
Cusy	13	14	8/17/2018 5:28 PM	MDH
Dukole	11	17	8/17/2018 5:28 PM	MDH
Edowel	7	12	8/17/2018 5:28 PM	MDH
Hafsoo	1	1	8/17/2018 5:28 PM	MDH
Homly	10	17	8/17/2018 5:28 PM	MDH
Maro	12	16	8/17/2018 5:28 PM	MDH
Pooley	9	11	8/17/2018 5:28 PM	MDH
Rolew	6	7	8/17/2018 5:28 PM	MDH
Sole	8	10	8/17/2018 5:28 PM	MDH
Tagool	8	15	8/17/2018 5:28 PM	MDH
Turone	11	14	8/17/2018 5:28 PM	MDH
Tushe	8	15	8/17/2018 5:28 PM	MDH
Umoy	10	20	8/17/2018 5:28 PM	MDH

Appendix J: Coding categories summary derived from the Interview results in NVivo

Ladugga Dissertation (November Restore) (NVivo 12).nvp - NVivo 12 Pro

File Home Import Create Explore Share

Clipboard: Cut, Copy, Paste, Merge
 Properties, Open
 Memo Link, Add To Set, Create As Code, Create As Cases
 Query, Visualize
 Code, Auto Code, Range Code, Uncode
 Case Classification, File Classification
 Detail View, Sort By, Undock, Navigation View, List View, Find

Quick Access: Files, Memos, Nodes

Data: Files (Focus group, Interview, Questionnaire), File Classifications, Externals

Codes: Nodes, Relationships, Relationship Types

Cases: Cases, Case Classifications

Notes, Search, Maps, Output

Name	Codes	References	Modified On	Modified By
Amerok	2	2	8/17/2018 5:29 PM	MDH
Bick	9	18	8/17/2018 5:29 PM	MDH
Bolock	7	10	8/17/2018 5:29 PM	MDH
Clowel	11	26	8/17/2018 5:29 PM	MDH
Deely	12	26	8/17/2018 5:29 PM	MDH
Gooles	10	25	8/17/2018 5:29 PM	MDH
Hored	10	43	8/17/2018 5:29 PM	MDH
Looly	8	28	8/17/2018 5:29 PM	MDH
Nelson Shilding	7	19	8/17/2018 5:29 PM	MDH
Nelson	7	12	8/17/2018 5:29 PM	MDH
Oslleb	7	21	8/17/2018 5:29 PM	MDH
Puloyl	6	12	8/17/2018 5:29 PM	MDH
Pusoleb	8	13	8/17/2018 5:29 PM	MDH
Quizol	9	21	8/17/2018 5:29 PM	MDH
Qulock	9	17	8/17/2018 5:29 PM	MDH
Soven	9	19	8/17/2018 5:29 PM	MDH
Sumuon	9	17	8/17/2018 5:29 PM	MDH
Witara	8	13	8/17/2018 5:29 PM	MDH

Appendix K: Coding categories summary derived from the Focus Group Discussions in NVivo

Ladugga Dissertation (November Restore) (NVivo 12).nvp - NVivo 12 Pro

File Home Import Create Explore Share

Clipboard Paste Cut Copy Merge Properties Open Memo Link Item Add To Set Create As Code Create As Cases Query Visualize Code Auto Code Range Code Uncode Case Classification File Detail View Sort By Undock Navigation View List View Find

Quick Access

- Files
- Memos
- Nodes

Data

- Files
 - Focus group
 - Interview
 - Questionnaire
- File Classifications
- Externals

Codes

- Nodes
- Relationships
- Relationship Types

Cases

- Cases
- Case Classifications

Notes

Search

Maps

Output

Focus group

Name	Codes	References	Modified On	Modified By
Elders	46	150	8/17/2018 5:29 PM	MDH
Female	10	64	8/17/2018 5:29 PM	MDH
Youth	13	80	8/17/2018 5:29 PM	MDH

Appendix L: Open Coding Categories and the Frequency of Appearance in Questionnaire, Interview and Focus Group

Tsetse Fly Disease			Mosquito Disease		
In Folder	References	Coverage	In Folder	References	Coverage
Files\\Focus group	11	0.41%	Files\\Focus group	14	0.91%
Files\\Focus group	21	1.39%	Files\\Focus group	22	1.82%
Files\\Focus group	13	0.47%	Files\\Focus group	6	0.58%
Files\\Interview	8	0.69%	Files\\Interview	8	1.33%
Files\\Interview	8	0.65%	Files\\Interview	8	1.45%
Files\\Interview	9	0.57%	Files\\Interview	8	1.34%
Files\\Interview	8	0.56%	Files\\Interview	7	1.30%
Files\\Interview	11	0.68%	Files\\Interview	7	0.90%
Files\\Interview	10	0.78%	Files\\Interview	7	1.10%
Files\\Interview	8	0.82%	Files\\Interview	7	1.39%
Files\\Interview	8	0.54%	Files\\Interview	10	1.53%
Files\\Interview	10	0.82%	Files\\Interview	9	1.52%
Files\\Interview	8	0.75%	Files\\Interview	12	2.21%
Files\\Interview	11	0.66%	Files\\Interview	6	0.84%
Files\\Interview	15	0.79%	Files\\Interview	20	1.88%
Files\\Interview	8	0.50%	Files\\Interview	7	1.16%
Files\\Interview	9	0.54%	Files\\Interview	5	0.81%
Files\\Interview	10	0.76%	Files\\Interview	12	2.12%
Files\\Interview	8	0.60%	Files\\Interview	5	1.01%
Files\\Interview	8	0.75%	Files\\Interview	8	1.69%
Files\\Interview	13	1.13%	Files\\Interview	9	1.39%
Files\\Questionnaire	16	1.29%	Files\\Questionnaire	19	2.79%
Files\\Questionnaire	20	1.57%	Files\\Questionnaire	16	2.42%
Files\\Questionnaire	17	1.59%	Files\\Questionnaire	18	2.92%
Files\\Questionnaire	15	1.27%	Files\\Questionnaire	18	2.91%
Files\\Questionnaire	15	1.39%	Files\\Questionnaire	17	3.25%
Files\\Questionnaire	15	1.43%	Files\\Questionnaire	17	3.09%
Files\\Questionnaire	13	0.99%	Files\\Questionnaire	15	2.49%
Files\\Questionnaire	17	1.58%	Files\\Questionnaire	17	2.73%
Files\\Questionnaire	15	1.09%	Files\\Questionnaire	16	2.38%
Files\\Questionnaire	12	0.93%	Files\\Questionnaire	15	2.50%
Files\\Questionnaire	17	1.34%	Files\\Questionnaire	20	2.92%
Files\\Questionnaire	18	1.42%	Files\\Questionnaire	19	2.81%

Files\\Questionnaire	20	1.57%	Files\\Questionnaire	16	2.42%
Files\\Questionnaire	22	2.13%	Files\\Questionnaire	24	4.01%
Files\\Questionnaire	20	1.29%	Files\\Questionnaire	18	2.24%
	467	35.74%		462	70.16%

Other

Sickness/Disease

Treatment/Prevention

In Folder	References	Coverage	In Folder	References	Coverage
Files\\Focus group	6	0.37%	Files\\Focus group	4	0.30%
Files\\Focus group	20	1.64%	Files\\Interview	2	0.41%
Files\\Focus group	2	0.19%	Files\\Interview	1	0.15%
Files\\Interview	4	0.64%	Files\\Interview	1	0.18%
Files\\Interview	3	0.53%	Files\\Interview	1	0.20%
Files\\Interview	4	0.50%	Files\\Questionnaire	1	0.19%
Files\\Interview	2	0.29%	Files\\Questionnaire	2	0.42%
Files\\Interview	3	0.56%	Files\\Questionnaire	1	0.21%
Files\\Interview	1	0.14%	Files\\Questionnaire	1	0.21%
Files\\Interview	2	0.30%	Files\\Questionnaire	1	0.16%
Files\\Interview	2	0.33%		15	2.44%
Files\\Interview	1	0.13%			
Files\\Interview	5	0.42%			
Files\\Interview	1	0.16%			
Files\\Interview	1	0.16%			
Files\\Interview	1	0.20%			
Files\\Interview	1	0.19%			
Files\\Interview	4	0.57%			
Files\\Questionnaire	6	0.82%			
Files\\Questionnaire	5	0.69%			
Files\\Questionnaire	7	1.06%			
Files\\Questionnaire	5	0.75%			
Files\\Questionnaire	3	0.51%			
Files\\Questionnaire	6	1.03%			
Files\\Questionnaire	2	0.30%			
Files\\Questionnaire	6	0.88%			
Files\\Questionnaire	3	0.40%			
Files\\Questionnaire	5	0.80%			
Files\\Questionnaire	7	0.96%			
Files\\Questionnaire	5	0.67%			
Files\\Questionnaire	5	0.69%			

Files\\Questionnaire	8	1.22%
Files\\Questionnaire	7	0.82%
	143	18.92%

Specific Health Issues			Uncertain Disease	
In Folder	References	Coverage	In Folder	References
Files\\Focus group	13	0.61%	Files\\Focus group	4
Files\\Focus group	12	2.77%	Files\\Focus group	15
Files\\Focus group	7	3.30%	Files\\Interview	2
Files\\Interview	21	3.76%	Files\\Interview	1
Files\\Interview	20	3.81%	Files\\Interview	2
Files\\Interview	22	3.49%	Files\\Interview	2
Files\\Interview	20	2.86%	Files\\Interview	2
Files\\Interview	27	2.83%	Files\\Interview	1
Files\\Interview	21	3.81%	Files\\Interview	2
Files\\Interview	23	3.93%	Files\\Interview	2
Files\\Interview	22	2.86%	Files\\Interview	1
Files\\Interview	26	2.70%	Files\\Interview	5
Files\\Interview	21	2.61%	Files\\Interview	1
Files\\Interview	25	3.59%	Files\\Interview	1
Files\\Interview	21	3.67%	Files\\Interview	4
Files\\Interview	25	2.58%	Files\\Questionnaire	5
Files\\Interview	25	3.41%	Files\\Questionnaire	5
Files\\Interview	22	2.99%	Files\\Questionnaire	6
Files\\Interview	18	4.29%	Files\\Questionnaire	4
Files\\Interview	21	2.74%	Files\\Questionnaire	3
Files\\Interview	21	1.54%	Files\\Questionnaire	4
Files\\Questionnaire	29	3.55%	Files\\Questionnaire	2
Files\\Questionnaire	32	1.72%	Files\\Questionnaire	6
Files\\Questionnaire	30	3.10%	Files\\Questionnaire	3
Files\\Questionnaire	28	0.72%	Files\\Questionnaire	2
Files\\Questionnaire	26	0.51%	Files\\Questionnaire	5
Files\\Questionnaire	28	4.45%	Files\\Questionnaire	5
Files\\Questionnaire	29	3.05%	Files\\Questionnaire	5
Files\\Questionnaire	34	3.11%	Files\\Questionnaire	8
Files\\Questionnaire	31	3.33%	Files\\Questionnaire	5
Files\\Questionnaire	3	3.76%		113

Files\\Questionnaire	35	2.97%
Files\\Questionnaire	27	3.92%
Files\\Questionnaire	29	2.82%
Files\\Questionnaire	32	3.50%
Files\\Questionnaire	30	3.07%
Files\\Questionnaire	32	2.62%
888	110.34%	

Personal Well-being

Social Health Infrastructure

Files\\Focus group	1	0.09%	In Folder	References	Coverage
Files\\Focus group	1	0.05%	Files\\Focus group	8	0.40%
Files\\Interview	1	0.09%	Files\\Focus group	4	0.27%
Files\\Interview	1	0.18%	Files\\Focus group	7	0.51%
Files\\Interview	2	0.20%	Files\\Interview	18	2.32%
Files\\Interview	2	0.33%	Files\\Interview	18	2.49%
Files\\Interview	1	0.16%	Files\\Interview	19	2.39%
Files\\Interview	1	0.17%	Files\\Interview	17	2.37%
Files\\Interview	2	0.19%	Files\\Interview	21	2.10%
Files\\Interview	2	0.14%	Files\\Interview	17	2.08%
Files\\Interview	1	0.05%	Files\\Interview	19	2.93%
Files\\Interview	1	0.17%	Files\\Interview	17	1.98%
Files\\Interview	2	0.32%	Files\\Interview	22	2.86%
Files\\Interview	1	0.09%	Files\\Interview	16	2.26%
Files\\Interview	2	0.40%	Files\\Interview	22	2.37%
Files\\Questionnaire	1	0.16%	Files\\Interview	16	1.16%
Files\\Questionnaire	3	0.34%	Files\\Interview	20	2.48%
Files\\Questionnaire	2	0.28%	Files\\Interview	23	2.78%
Files\\Questionnaire	3	0.25%	Files\\Interview	17	2.28%
Files\\Questionnaire	2	0.23%	Files\\Interview	16	2.42%
Files\\Questionnaire	4	0.51%	Files\\Interview	19	3.07%
Files\\Questionnaire	1	0.15%	Files\\Interview	17	2.09%
Files\\Questionnaire	2	0.15%	Files\\Questionnaire	29	3.30%
Files\\Questionnaire	1	0.16%	Files\\Questionnaire	31	3.66%
Files\\Questionnaire	4	0.61%	Files\\Questionnaire	30	3.81%
Files\\Questionnaire	1	0.06%	Files\\Questionnaire	28	3.49%
45	5.53%	Files\\Questionnaire	26	3.81%	
		Files\\Questionnaire	28	3.93%	
		Files\\Questionnaire	29	3.67%	

Files\\Questionnaire	34	4.29%
Files\\Questionnaire	31	3.55%
Files\\Questionnaire	3	1.72%
Files\\Questionnaire	35	4.45%
Files\\Questionnaire	27	3.05%
Files\\Questionnaire	29	3.33%
Files\\Questionnaire	31	3.66%
Files\\Questionnaire	30	3.92%
Files\\Questionnaire	31	2.99%
	805	100.23%

Update of Recent Happening			Emerging Disease		
In Folder	References	Coverage	In Folder	References	Coverage
Files\\Focus group	1	0.05%	Files\\Focus group	4	0.24%
Files\\Focus group	1	0.07%	Files\\Focus group	15	1.19%
Files\\Interview	1	0.13%	Files\\Interview	2	0.30%
Files\\Interview	1	0.14%	Files\\Interview	1	0.16%
Files\\Interview	1	0.13%	Files\\Interview	2	0.23%
Files\\Interview	2	0.28%	Files\\Interview	2	0.29%
Files\\Interview	1	0.10%	Files\\Interview	2	0.36%
Files\\Interview	1	0.12%	Files\\Interview	1	0.14%
Files\\Interview	1	0.15%	Files\\Interview	2	0.30%
Files\\Interview	2	0.19%	Files\\Interview	2	0.33%
Files\\Interview	1	0.13%	Files\\Interview	1	0.13%
Files\\Interview	1	0.14%	Files\\Interview	5	0.42%
Files\\Interview	1	0.11%	Files\\Interview	1	0.16%
Files\\Interview	3	0.22%	Files\\Interview	1	0.19%
Files\\Interview	1	0.12%	Files\\Interview	4	0.57%
Files\\Interview	2	0.24%	Files\\Questionnaire	5	0.66%
Files\\Interview	1	0.13%	Files\\Questionnaire	5	0.69%
Files\\Interview	2	0.30%	Files\\Questionnaire	6	0.89%
Files\\Interview	2	0.27%	Files\\Questionnaire	4	0.58%
Files\\Interview	2	0.20%	Files\\Questionnaire	3	0.51%
Files\\Questionnaire	2	0.23%	Files\\Questionnaire	4	0.66%
Files\\Questionnaire	1	0.12%	Files\\Questionnaire	2	0.30%
Files\\Questionnaire	1	0.13%	Files\\Questionnaire	6	0.88%
Files\\Questionnaire	2	0.25%	Files\\Questionnaire	3	0.40%
Files\\Questionnaire	1	0.15%	Files\\Questionnaire	2	0.30%

Files\\Questionnaire	2	0.28%	Files\\Questionnaire	5	0.66%
Files\\Questionnaire	2	0.25%	Files\\Questionnaire	5	0.67%
Files\\Questionnaire	2	0.25%	Files\\Questionnaire	5	0.69%
Files\\Questionnaire	2	0.23%	Files\\Questionnaire	8	1.22%
Files\\Questionnaire	1	0.57%	Files\\Questionnaire	5	0.56%
Files\\Questionnaire	1	0.13%		113	14.67%
Files\\Questionnaire	1	0.11%			
Files\\Questionnaire	2	0.23%			
Files\\Questionnaire	1	0.12%			
Files\\Questionnaire	2	0.26%			
Files\\Questionnaire	2	0.19%			
	53	6.73%			

Quality of Life

Causes of Death

In Folder	References	Coverage	In Folder	References	Coverage
Files\\Questionnaire	1	0.08%	Files\\Focus group	1	0.04%
Files\\Questionnaire	1	0.08%	Files\\Focus group	3	0.18%
Files\\Questionnaire	1	0.08%	Files\\Focus group	4	0.26%
Files\\Questionnaire	1	0.08%	Files\\Interview	1	0.13%
	4	0.32%	Files\\Interview	1	0.13%
			Files\\Interview	2	0.20%
			Files\\Interview	1	0.12%
			Files\\Interview	3	0.19%
			Files\\Interview	1	0.12%
			Files\\Interview	1	0.16%
			Files\\Questionnaire	1	0.11%
			Files\\Questionnaire	2	0.23%
			Files\\Questionnaire	1	0.15%
			Files\\Questionnaire	1	0.14%
			Files\\Questionnaire	1	0.11%
			Files\\Questionnaire	1	0.11%
			Files\\Questionnaire	2	0.25%
			Files\\Questionnaire	4	0.45%
			Files\\Questionnaire	2	0.23%
			Files\\Questionnaire	4	0.52%
			Files\\Questionnaire	3	0.29%
				40	4.14%

Traditional Approach			Modern Approach		
In Folder	References	Coverage	In Folder	References	Coverage
Files\Focus group	3	0.20%	Files\Focus group	3	0.20%
Files\Focus group	11	1.00%	Files\Focus group	11	1.00%
Files\Focus group	6	0.58%	Files\Focus group	6	0.58%
Files\Interview	2	0.34%	Files\Interview	2	0.34%
Files\Interview	4	0.74%	Files\Interview	4	0.74%
Files\Interview	1	0.17%	Files\Interview	1	0.17%
Files\Interview	2	0.37%	Files\Interview	2	0.37%
Files\Interview	4	0.53%	Files\Interview	4	0.53%
Files\Interview	1	0.16%	Files\Interview	1	0.16%
Files\Interview	3	0.62%	Files\Interview	3	0.62%
Files\Interview	3	0.47%	Files\Interview	3	0.47%
Files\Interview	1	0.19%	Files\Interview	1	0.19%
Files\Interview	4	0.57%	Files\Interview	4	0.57%
Files\Interview	1	0.10%	Files\Interview	1	0.10%
Files\Interview	2	0.33%	Files\Interview	2	0.33%
Files\Interview	1	0.22%	Files\Interview	1	0.22%
Files\Interview	1	0.16%	Files\Interview	1	0.16%
Files\Questionnaire	1	0.19%	Files\Questionnaire	1	0.19%
	51	6.93%		51	6.93%

Mobile Phone Approach			Interpersonal Comm.		
In Folder	References	Coverage	In Folder	References	Coverage
Files\Focus group	1	0.05%	Files\Focus group	2	0.22%
Files\Focus group	1	0.07%	Files\Focus group	2	0.31%
Files\Interview	1	0.13%	Files\Interview	1	0.30%
Files\Interview	1	0.14%	Files\Interview	1	0.26%
Files\Interview	1	0.11%		6	1.09%
Files\Interview	1	0.12%			
	6	0.62%			

Observation of Treatment

Self-Help Seeking

In Folder	References	Coverage	In Folder	References	Coverage
Files\\Focus group	8	0.54%	Files\\Focus group	7	0.31%
Files\\Focus group	15	1.19%	Files\\Focus group	3	0.17%
Files\\Interview	3	0.49%	Files\\Focus group	3	0.22%
Files\\Interview	1	0.16%	Files\\Interview	6	0.77%
Files\\Interview	3	0.38%	Files\\Interview	8	1.01%
Files\\Interview	3	0.51%	Files\\Interview	6	0.76%
Files\\Interview	2	0.36%	Files\\Interview	6	0.84%
Files\\Interview	1	0.14%	Files\\Interview	6	0.60%
Files\\Interview	2	0.30%	Files\\Interview	7	0.82%
Files\\Interview	2	0.33%	Files\\Interview	6	0.92%
Files\\Interview	1	0.13%	Files\\Interview	5	0.62%
Files\\Interview	5	0.42%	Files\\Interview	6	0.78%
Files\\Interview	1	0.18%	Files\\Interview	6	0.85%
Files\\Interview	2	0.36%	Files\\Interview	8	0.84%
Files\\Interview	1	0.19%	Files\\Interview	5	0.39%
Files\\Interview	4	0.57%	Files\\Interview	6	0.74%
Files\\Questionnaire	5	0.66%	Files\\Interview	6	0.79%
Files\\Questionnaire	5	0.69%	Files\\Interview	7	0.89%
Files\\Questionnaire	6	0.89%	Files\\Interview	6	0.91%
Files\\Questionnaire	4	0.58%	Files\\Interview	6	1.05%
Files\\Questionnaire	3	0.51%	Files\\Interview	5	0.65%
Files\\Questionnaire	4	0.66%	Files\\Questionnaire	11	1.18%
Files\\Questionnaire	2	0.30%	Files\\Questionnaire	12	1.36%
Files\\Questionnaire	6	0.88%	Files\\Questionnaire	10	1.16%
Files\\Questionnaire	3	0.40%	Files\\Questionnaire	11	1.29%
Files\\Questionnaire	2	0.30%	Files\\Questionnaire	10	1.34%
Files\\Questionnaire	5	0.66%	Files\\Questionnaire	11	1.38%
Files\\Questionnaire	5	0.67%	Files\\Questionnaire	12	1.39%
Files\\Questionnaire	5	0.69%	Files\\Questionnaire	13	1.41%
Files\\Questionnaire	8	1.22%	Files\\Questionnaire	10	1.05%
Files\\Questionnaire	5	0.56%	Files\\Questionnaire	3	1.72%
	122	15.92%	Files\\Questionnaire	11	1.25%
			Files\\Questionnaire	12	1.30%
			Files\\Questionnaire	10	1.05%
			Files\\Questionnaire	12	1.36%
			Files\\Questionnaire	10	1.20%
			Files\\Questionnaire	13	1.13%

Frequent Sources			Lesser Source		
In Folder	References	Coverage	In Folder	References	Coverage
Files\\Focus group	2	0.12%	Files\\Focus group	2	0.12%
Files\\Focus group	2	0.16%	Files\\Focus group	2	0.16%
Files\\Focus group	3	0.25%	Files\\Focus group	3	0.25%
Files\\Interview	6	0.90%	Files\\Interview	6	0.90%
Files\\Interview	7	1.13%	Files\\Interview	7	1.13%
Files\\Interview	6	0.88%	Files\\Interview	6	0.88%
Files\\Interview	6	0.98%	Files\\Interview	6	0.98%
Files\\Interview	6	0.70%	Files\\Interview	6	0.70%
Files\\Interview	6	0.86%	Files\\Interview	6	0.86%
Files\\Interview	6	1.08%	Files\\Interview	6	1.08%
Files\\Interview	6	0.82%	Files\\Interview	6	0.82%
Files\\Interview	6	0.91%	Files\\Interview	6	0.91%
Files\\Interview	7	1.15%	Files\\Interview	7	1.15%
Files\\Interview	8	1.00%	Files\\Interview	8	1.00%
Files\\Interview	6	0.51%	Files\\Interview	6	0.51%
Files\\Interview	6	0.87%	Files\\Interview	6	0.87%
Files\\Interview	6	0.85%	Files\\Interview	6	0.85%
Files\\Interview	6	0.94%	Files\\Interview	6	0.94%
Files\\Interview	6	1.06%	Files\\Interview	6	1.06%
Files\\Interview	6	1.13%	Files\\Interview	6	1.13%
Files\\Interview	6	0.86%	Files\\Interview	6	0.86%
Files\\Questionnaire	4	0.53%	Files\\Questionnaire	4	0.53%
Files\\Questionnaire	4	0.55%	Files\\Questionnaire	4	0.55%
Files\\Questionnaire	4	0.59%	Files\\Questionnaire	4	0.59%
Files\\Questionnaire	4	0.58%	Files\\Questionnaire	4	0.58%
Files\\Questionnaire	4	0.68%	Files\\Questionnaire	4	0.68%
Files\\Questionnaire	4	0.66%	Files\\Questionnaire	4	0.66%
Files\\Questionnaire	4	0.59%	Files\\Questionnaire	4	0.59%
Files\\Questionnaire	4	0.59%	Files\\Questionnaire	4	0.59%
Files\\Questionnaire	5	0.67%	Files\\Questionnaire	5	0.67%
Files\\Questionnaire	4	0.59%	Files\\Questionnaire	4	0.59%
Files\\Questionnaire	4	0.53%	Files\\Questionnaire	4	0.53%
Files\\Questionnaire	5	0.69%	Files\\Questionnaire	4	0.54%
Files\\Questionnaire	4	0.55%	Files\\Questionnaire	4	0.55%

Files\\Questionnaire	4	0.61%	Files\\Questionnaire	4	0.61%
Files\\Questionnaire	4	0.45%	Files\\Questionnaire	4	0.45%
	181	26.01%		180	25.85%

Rare Sources			Ecological Problem		
In Folder	References	Coverage	In Folder	References	Coverage
Files\\Focus group	2	0.12%	Files\\Focus group	21	1.24%
Files\\Focus group	2	0.16%	Files\\Focus group	20	1.58%
Files\\Focus group	3	0.25%	Files\\Focus group	13	1.10%
Files\\Interview	6	0.90%	Files\\Interview	6	0.90%
Files\\Interview	7	1.13%	Files\\Interview	1	0.16%
Files\\Interview	6	0.88%	Files\\Interview	2	0.29%
Files\\Interview	6	0.98%	Files\\Interview	6	0.98%
Files\\Interview	6	0.70%	Files\\Interview	2	0.23%
Files\\Interview	6	0.86%	Files\\Interview	5	0.71%
Files\\Interview	6	1.08%	Files\\Interview	2	0.36%
Files\\Interview	6	0.82%	Files\\Interview	7	0.95%
Files\\Interview	6	0.91%	Files\\Interview	6	0.91%
Files\\Interview	7	1.15%	Files\\Interview	3	0.49%
Files\\Interview	8	1.00%	Files\\Interview	5	0.63%
Files\\Interview	6	0.51%	Files\\Interview	5	0.42%
Files\\Interview	6	0.87%	Files\\Interview	2	0.29%
Files\\Interview	6	0.85%	Files\\Interview	1	0.14%
Files\\Interview	6	0.94%	Files\\Interview	4	0.63%
Files\\Interview	6	1.06%	Files\\Interview	1	0.18%
Files\\Interview	6	1.13%	Files\\Interview	2	0.38%
Files\\Interview	6	0.86%	Files\\Questionnaire	3	0.41%
Files\\Questionnaire	4	0.53%	Files\\Questionnaire	1	0.15%
Files\\Questionnaire	4	0.55%	Files\\Questionnaire	1	0.15%
Files\\Questionnaire	4	0.59%	Files\\Questionnaire	1	0.13%
Files\\Questionnaire	4	0.58%	Files\\Questionnaire	1	0.15%
Files\\Questionnaire	4	0.68%	Files\\Questionnaire	1	0.13%
Files\\Questionnaire	4	0.66%	Files\\Questionnaire	3	0.41%
Files\\Questionnaire	4	0.59%	Files\\Questionnaire	4	0.61%
Files\\Questionnaire	4	0.59%	Files\\Questionnaire	1	0.11%
Files\\Questionnaire	5	0.67%	Files\\Interview	4	0.57%
Files\\Questionnaire	4	0.59%		130	14.83%
Files\\Questionnaire	4	0.53%			

Files\\Questionnaire	4	0.54%
Files\\Questionnaire	4	0.55%
Files\\Questionnaire	4	0.61%
Files\\Questionnaire	4	0.45%
	180	25.85%

Curriculum Vitae

Musa Dauda Hassan

EDUCATION

University of Wisconsin Milwaukee, Milwaukee, WI, USA

Ph.D. in Information Studies (2019).

Dissertation Title: *Consumer Health Information Needs, Seeking And Searching Behavior By Rural Residents in The Kachia Grazing Reserve, with a Focus on Vector-Borne Diseases*

Major Professor: Dietmar Wolfram Ph.D., Professor

Committee Members

Iris Xie, Ph.D. Professor, Jin Zhang, Ph.D. Professor, Nambisan Priya Ph.D. Associate Professor, Laretta Henderson, Ph.D. Associate Professor, and Xiangming Simon Mu Ph.D. Associate Professor.

Ahmadu Bello University, Zaria, Nigeria

- Master's in Information Management. 2010-2011
- Post-Graduate Diploma in Information Management. 2005-2006
- Bachelor's Degree in Library and Information Science. 1996-1999
- Diploma in Library and Information Science. 1991-1999

GRANTS

Nigerian Institute for Trypanosomiasis Research, Kaduna, Nigeria

- Socio economic research campaign on Tsetse and Trypanosomiasis Disease in Keffi Nasarawa State, \$555. 2005-2006
- Socio economic research campaign on Tsetse and Trypanosomiasis Disease in Ladugga grazing reserve Kaduna state, \$555. 2005-2006
- Seminar/ Lecture Series on Tsetse and Trypanosomiasis research Kaduna Head Quarter, \$555. 2005-2006

University of Wisconsin-Milwaukee, Milwaukee

- Chancellor Student Grant, \$1000. 2014
- Chancellor Student Grant, \$1000. 2016
- School of Information Research Grant, \$900. 2018
- Graduate School Student travel research grant, \$500. 2018
- Chancellor Student Grant, \$2500. 2018
- School of Information Research Grant, \$900. 2019

PUBLICATIONS

Peer-reviewed Journals

Hassan, M.D., & Wolfram, D., A Study of the Health Information Behavior of African Refugees in the Midwest Area. (*Under review*).

Hassan, M.D., Wolfram, D., & Castanha, R.C.G., Scientometric analysis of trypanosomiasis publications from 1987 to 2016. *Journal of Infection and Public Health* (*recently accepted*).

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- Hassan, M.D. (2006). Impact and assessment of Trypanosomiasis cases in Ladduga. Nigerian Institute for Trypanosomiasis Research, Kaduna, Nigeria.

CONFERENCE & PRESENTATIONS

- Hassan, M.D. (2019). Factors that Influence Undergraduates, Information Seeking, Judgment, and Document Selection on the Internet. School of Information Research Days. University of Wisconsin- Milwaukee, WI.
- Hassan, M.D. (2019). Analysis of Consumer Health Information Websites: Mayo Clinic and WebMD. School of Information Research Days. University of Wisconsin-Milwaukee, WI.
- Hassan, M.D. (2019). On the Web at Class: How Tech Tools are Distracting the Inside Search Process of Undergraduate Information-seeking Behavior. School of Information Brown bag faculty presentation. University of Wisconsin-Milwaukee, WI.
- Hassan, M.D. (2019). Study of the Information Behavior of African Refugees in the Midwest Area. iConference Washington DC.
- Hassan, M.D. (2018). Difficulties and Challenges of Health Data Collection in Rural Communities in Nigeria/Africa. School of Information Research Days. University of Wisconsin-Milwaukee, WI.
- Hassan, M.D. (2018). Similarities and variation of Library and Information Science courses offered among four universities in Nigeria and United States. Association of Library and Information Science Educators ALISE. Denver, CO.
- Hassan, M.D. (2017). Open Access to knowledge and information: The solution to an African problem in scholarly work. African Studies Association Conference Chicago, IL.
- Hassan, M.D. (2017). The implication of health information-seeking and sharing among users of WhatsApp. Wisconsin Association of Academic Libraries Conference. Elkhart Lake, WI.
- Hassan, M.D. (2017). Implications of consumer health information for medical professionals. Wisconsin Association of Academic Libraries Conference. Elkhart Lake, WI.
- Hassan, M.D. (2016). Health Information needs, seeking, and searching behavior among African refugees and Immigrants settled in the Milwaukee Area. School of Information Research Days. University of Wisconsin-Milwaukee, WI.

Mohammed, Mamman, Osue, Hudu & Hassan Dauda Musa (2010) “Proposed Nigerian ANDI Center of Excellence for African trypanosomiasis and Onchocerciasis Research, ILRI Kenya
 Hassan, M.D. (2011) Web information technology and its application to retrieval of information. West African Research Institute Management Association Conference, Freetown, Sierra Leone.

RESEARCH IN PROGRESS

Hassan, M.D., & Wolfram, D., A Study of the Health Information Behavior of African Refugees in the Midwest Area. *Library Quarterly*.
 Hassan, M.D., Wolfram, D., & Castanha, R.C.G., Scientometric Analysis of Trypanosomiasis Publications from 1987 to 2016. *Journal of Infection and Public Health*.
 Hassan, M.D. The implication of health information-seeking and sharing among user of WhatsApp Social Network. *Ed Tech Journal*.
 Hassan, M.D., Analysis of Consumer Health Information Websites: Mayo Clinic and WebMD.
 Hassan, M.D., On the Web at Class: How Tech Tools are Distracting the Inside Search Process of Undergraduate Information-seeking Behavior.
 Hassan, M.D. Challenges and ethical consideration survey of data collection in rural communities.
 Hassan, M.D., Review of findings of health information-seeking behaviors among consumer health patients in some papers published (between 2000 and 2015).
 Hassan, M.D., Domain analyses of consumer health information needs of trypanosomiasis disease using web of science database.
 Hassan, M.D., Malaria: The science of information retrieval in the context of developing world.
 Hassan, M.D., Factors that Influence Undergraduates Students, Information Seeking, Judgment, and Document Selection on the Internet.
 Hassan, M.D., Similarities and variation of Library and Information Science courses offered among four universities in Nigeria and United States.
 Hassan, M.D., Open Access to knowledge and information: The solution to an African problem in scholarly work.
 Hassan, M.D., Implications of consumer health information-seeking and relationship to medical professionals.

TEACHING EXPERIENCE

Ahmadu Bello University, Zaria Nigeria

- Cataloguing and Classification, Reference information service. 2006-2007
 Nigerian Institute for Trypanosomiasis Research
- Use of Library, Library Information literacy, Audio Visual service. 2008-2014
 University of Wisconsin-Milwaukee, Milwaukee, WI.
- INFOST 571 Information Access and Retrieval. 2016
- INFOST 571 Information Access and Retrieval (Online session). 2017
- INFOST 410 Database Information Retrieval System. Fall 2018
- INFOST 410 Database Information Retrieval System (Online session). Fall 2018
- INFOST 410 Database Information Retrieval System. Spring 2019
- INFOST 410 Database Information Retrieval System (Online session). Spring 2019
- INFOST 410 Database Information Retrieval System (Online session). Fall 2019

Invited Lectures

- INFOST 799 Class Research method in information studies section 202 “Challenges of research data collection in rural communities” (2017)
- INFOST 571 Class Information Access and Retrieval. “Consumer health information retrieval” (2017).
- INFOST 230 Class Organization of Knowledge, “Metadata and abstracting work in information retrieval”.
- INFOST 410 Database Information Retrieval System, co-teach the class Fall 2018.

RESEARCH EXPERIENCE

Nigerian Institute for Trypanosomiasis Research Library Nigeria

- Compiled trypanosomiasis annotated bibliography.
- Compiled Institute research handbook guide to research staff.
- Provided research assistance in intellectual property on the Institute library policy.
- Coordinated and provided research assistance for undergraduate industrial attachment students.
- Provided socio-economic information on impact and awareness of tsetse fly in some village part of Nasarawa state.
- Conducted socio economic impact and assessment of trypanosomiasis cases in Ladugga grazing reserve, Kaduna state.
- Monitoring and evaluation of institute research team of tsetse and trypanosomiasis study.
- Participated in small animal research routinely infected with *t. brucie* parasite.

Research Assistant:

School of Information Studies, University of Wisconsin-Milwaukee,

William Peekhaus Ph.D.

- “Annotated bibliography for peer-reviewed articles that treat the environmental impact of genetically engineered crops” and “The effect of electronic waste: the contribution of Library and Information literature LIS to electronic waste management”.

Dietmar Wolfram Ph.D.

- “The information needs, seeking and searching behavior of African refugees in Midwest area of United States”.
- Scientometric Analysis of Trypanosomiasis Publication from 1987 to 2016”.
- The implication of Health Information-seeking and Sharing among user of WhatsApp social Network”, “Consumer Health Information Seeking: Analysis of two health clinic websites”.

LIBRARY & INFORMATION SCIENCE WORKING EXPERIENCE

Nigerian Institute for Trypanosomiasis Research Library, Kaduna, Nigeria

Principal Research Librarian (2011-2014)

- Provided information retrieval and electronic archiving of research institutes library materials.
- Answered virtual reference inquiries from other branches of the institutes through e-mails.
- Coordinated institutes library electronic resources among all research departments.

- Maintained and developed the research institutes website to be up-to-date and user-centered and accessible.
- Participated in the institutes external research grant proposal writing.
- Facilitated in the identification, adoption, negotiation, recommendation and acquisition of institutes electronic resources.
- Maintained online access to licensed and open access to electronic resources.
- Acted as library liaison officer to institute online journal subscription and access.
- Led and supervised library staff in a various job schedule
- Participated in staff training and teaches information literacy and library instruction,
- Engaged in library collections development exercises, policies, and services.
- Guided and trained research staff on the use of the HINARI database.
- Provided researchers with information on an alternative for dissemination, publication and preservation of scholarly work.
- Developed information access to library patron through indexing and annotated bibliographies.
- Responsible for recording the quarterly statistical data of pupae of *Glossina Palpalis*, *G. fuscipes* (an insect from immature from between larva and adult) received from FAO/IAEA Agriculture and Biotechnology Laboratory Vienna.
- Maintained data curation cycle and data repository.
- Participated in institutes health-related research.
- Provided reference and information support to the staff of the research departments.
- Participated in library budgeting, planning and implementation.
- Performed other assigned duties.

Senior Research Librarian (2008-2011)

- Led library staffs to the process of digitizing vital documents of the institutes (i.e., Annual report)
- Performed technical service duties related to the acquisition and processing of library material following and applying a rigorous selection process.
- Collaborated with research staff on systematic review including comprehensive searches across multiple biomedical databases.
- Participated in monitoring and research evaluation, reporting research impact and metrics.
- Performed research information services.
- Helped in the compilation of bibliographic abstract relevance institute information received from Tsetse and Trypanosomiasis Information Quarterly TTIQ.
- Promoted library resources to the staff of the institute through an internal library bulletin.
- Coordinated multimedia trypanosomiasis and onchocerciasis research presentation of the institutes.
- Designed and produce research guides, information library literacy tutorial program.
- Compiled trypanosomiasis annotated bibliography.
- Coordinate and provided research assistance for undergraduate Industrial Attachment students.
- Performed other assigned duties.

Research Librarian I (2005-2008)

- Provided socio-economic information on impact and awareness of tsetse fly in some village parts of Nasarawa state Nigeria.
- Conducted the socio-economic impact and assessment of trypanosomiasis cases in Ladugga grazing reserve, Kaduna state Nigeria.
- Performed reference information services in the serial and monograph section of the Library.
- Provided Audio-Visual service to library patrons.
- Planned and implemented library-orientation programs such as displays/exhibition/library events.
- Facilitated the Interlibrary loans of material not available in the library.
- Performed other assigned duties.

Research Librarian II (2002-2005)

- Performed cataloging and classification of materials received in the library.
- Provided direct reference and information services to biomedical research officer of the institutes
- Collect and organized collections of books, pamphlets, manuscripts, publications, other documents in the library through shelving.
- Provide back-up assistance in the circulation desk.
- Curate and provide direct guide to Audiovisual material including research cassette and video film
- Checked books in and out of the Library.
- Performed other assigned duties.

ACADEMIC SERVICE

School of Information Studies University of Wisconsin-Milwaukee, Milwaukee, WI.

- Strategic planning and retreat for Multicultural Network (MCN) UWM. 2018
- School of Information retreat and recruitment of students. 2018
Milwaukee Area Technical College MATC at Downtown & Mequon Campus
- Milwaukee Public Library Downtown area. 2018
- Diversity and Equity Committee. 2016-Present
- Assistant Editor Open Information Science Journal
(<https://www.degruyter.com/view/j/opis>). 2017-2018
- International Students Mentor Program Center for International & Scholarship. 2018-2019

Nigerian Institute for Trypanosomiasis Research, Kaduna, Nigeria.

- Internet Services Department Committee. 2012-2014
- Committee on Computer Aid International. 2007-2014
- Coordinator, Institutes' Scientific Research Online Search. 2005-2014
- Assistant Circulating Secretary, Research Committee. 2007-2014
- Secretary, Institute's Tropical Diseases Research. 2006
- Socio-Economic Research Team Leader in Ladugga Grazing Reserve. 2006
- Secretary, Workshop/Seminar Lecture committee. 2005-2014
- Secretary, Institute's journal publication/newsletter committee. 2005-2014

- Secretary, Monitoring Management Information System and Service Department. 2003-2014

HONOR SOCIETIES

- Member: International Student Teaching Assistance Group UW-Milwaukee. 2018- Present
 Member: African Student Association MSA UW-Milwaukee. 2014-Present
 Member: Sociocultural Student Advisory Council UW-Milwaukee. 2014/2015

TRAINING

- Online Blended Teaching Training, University Wisconsin-Milwaukee. 2018
 HIPPA Human Subject Research Online Test. 2017
 IRB Basic University of Wisconsin Institutional Review Board. 2017
 Informed Consent University of Wisconsin Institutional Review Board. 2017
 International Research University of Wisconsin Institutional Review Board. 2017
 Software Product Technology in Information Communication Technology, XIPHAIS IT Company Bangalore, India. 2013
 Adobe Photoshop CS master's in graphic designing Rolla square, Sharjah, UAE. 2011
 E-Archive Course, Abu Dhabi, UAE. 2009
 Socio-economic Research on impact and awareness of Tsetse fly in some village Nasarawa state, NITR Research Project. 2006
 Cataloging and Indexing Seminar workshop, Oshoogbo, Nigeria. 2005
 Train the Trainer Training Certificate Microsoft (NITDA), Abuja, Nigeria. 2005
 Industrial Attachment Kashim Ibrahim Library (KIL), ABU, Zaria, Nigeria. 1999

I.T. FLUENCY

Microsoft Office: Word, PowerPoint, Excel, Visio, Outlook. Adobe Photoshop, iMove, Coral Draw, QSR, NVivo, SPSS, VOS Viewer, WordStat. SQL, HTML R, Python.
 Library software: Tinlib, Libwin, SignUp, WorldShare Management Service, LibAnswers, KOHA.

LANGUAGES

Fluent in Hausa (Native), English, Arabic and Fulfulde.